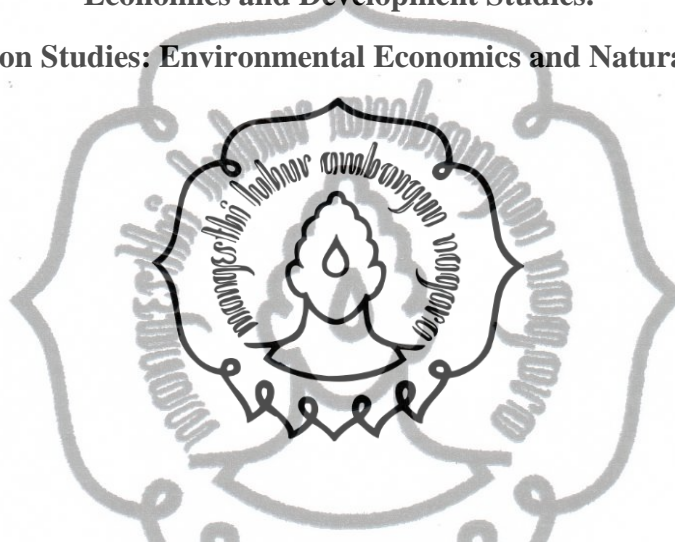


**AN IMPULSE OF HUMAN ACTIVITIES TO CARBON DIOXIDE GAS EMISSIONS IN
THE SUB-SAHARAN AFRICA REGION.**

THESIS

**Compiled to Fulfill the Requirements of Graduate School for Master Program of
Economics and Development Studies.**

Concentration Studies: Environmental Economics and Natural Resources



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SURAKARTA

2021

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Aboyitungiye Jean Baptiste

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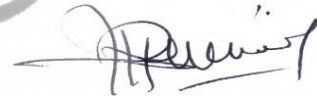
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In any situation that any elements of plagiarism are found in this research work, then I will be accountable for any appropriate academic sanctions with applicable laws and regulations.

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MOTTO

Then God said, ' Let us make man in our image, in our likeness, and let them rule over the fish of the sea and birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground.

(Genesis1:26)

Your life depends on healthy earth; play as it is yours.

(Writer)

An excellent way to do econometrics is to look for good natural experiments and use statistical methods to tidy up the confounding factors that nature has not controlled for us.

(Daniel McFadden)

What interests me is the movement of intelligence because the future depends on it.

(----)

When you decide to do something and work on it with all your dedication, that is your first success.

(Ehsaas)

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Embarking on the journey of pursuing a graduate degree from Universitas Sebelas Maret UNS was a courageous and wise step to take in my educational development. This journey would not have been made possible without the help, encouragement, and support of many people.

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Only enough to say,

Thank you

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AN IMPULSE OF HUMAN ACTIVITIES TO CARBON DIOXIDE GAS EMISSIONS IN THE SUB-SAHARAN AFRICA REGION.

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Abstract

Studying the relation between human activities and GHG emissions is crucial in the proposal of environmental policies of 21 century. Hence, the following question arises: How to meet long-term economic needs while respecting the environment and achieving low carbon transitions? This study base on recent advances in econometric research. It consists of developing new theories in the study of stationary time series, which allows the development of a new methodology around the fundamental concepts of cointegration, vector error correction model, and impulse analysis causality. The objective highlights trends of carbon dioxide emissions to agricultural land, energy use, agriculture-forestry, other land use, real gross domestic product, and industry & construction based on human activities and their contribution to current and future GHG emissions SSA region within 1981-2014 period.

On the premise of the Johansen cointegration relationships, the VECM confirms a long-term relationship between CO₂ emissions and the considered indicators. In the sense of a causal relationship, the growth of carbon emissions in the SSA does not necessarily promote agricultural land, energy use, and agriculture-forestry and fisheries growth. That means, so far, the development of those sectors in the region does not intensify the excessive pollutants to cause plenty of carbon emissions. To shed light on the interrelationships between variables, the impulse relationship of the VECM shows that a one standard deviation shock on agriculture, forestry -and other land use and energy use will cause a significant increase in CO₂ emissions for ten periods. The variance decomposition made it possible to deduce that the variance of the CO₂ forecast error is due for 91.06%, over the 10-year horizon, to its innovations. This study integrates the environmental side via CO₂ emissions that follow the rhythm imposed by human activities' acceleration. Hence, the interest of comprehensive incorporation between economic and ecological policies that satisfy the economy needs while facilitating transitions towards low-carbon development across the region. Developing the necessary guidelines to transform SSA's resources in the near term will play a prominent role in shaping SSA nations' growth. Policies that would assist in the mitigation of CO₂ emissions such as reducing demand for agricultural land by intensifying production, integrating rural land-use planning, removing subsidies to fossil fuel consumption, and other measures have been recommended in the study.

Key Words: Human activities, GHG emissions, environmental policies, sub-Saharan Africa, low-carbon.

DAMPAK KEGIATAN MANUSIA TERHADAP EMISI GAS KARBON DIOKSIDA DI WILAYAH SUB-SAHARAN AFRIKA.

Aboyitungiye Jean Baptiste

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Abstrak

Hubungan antara aktivitas manusia dan emisi GRK sangat penting untuk dipelajari dalam proses pengajuan kebijakan lingkungan di abad ke-21. Oleh karena itu, muncul pertanyaan berikut: Bagaimana memenuhi kebutuhan ekonomi jangka panjang dengan tetap mengutamakan lingkungan dan mencapai transisi rendah karbon? Untuk memberikan jawaban, studi ini didasarkan pada kebaruan dalam penelitian ekonometrik dalam studi deret waktu stasioner, yang memungkinkan pengembangan metodologi baru seperti konsep kunci kointegrasi, model koreksi kesalahan vektor, dan analisis kausalitas impuls. Tujuan penelitian ini adalah untuk mengetahui tren emisi karbon dioksida yang meliputi lahan pertanian, penggunaan energi, pertanian-kehutanan dan penggunaan lahan lainnya, produk domestik bruto riil, dan industri & konstruksi berdasarkan pada aktivitas manusia serta kontribusinya terhadap emisi GRK saat ini dan masa depan di wilayah SSA dalam periode 1981-2014.

Berdasarkan premis keberadaan hubungan kointegrasi Johansen, VECM menegaskan adanya hubungan jangka panjang antara emisi CO₂ dan indikator yang dipertimbangkan. Dalam arti hubungan sebab akibat, pertumbuhan emisi karbon dalam SSA tidak serta merta mendorong pertumbuhan lahan pertanian, penggunaan energi, dan pertanian-kehutanan dan perikanan. Artinya, selama ini pertumbuhan sektor-sektor tersebut di kawasan tidak menyebabkan polusi yang berlebihan sehingga menimbulkan banyak emisi karbon. Untuk menjelaskan keterkaitan antar variabel, hubungan impuls VECM menunjukkan bahwa satu perubahan deviasi standar pada pertanian, kehutanan - dan penggunaan lahan lainnya, dan penggunaan energi akan menyebabkan peningkatan emisi CO₂ yang signifikan selama 10 periode. Dekomposisi varians memungkinkan untuk menyimpulkan bahwa varians kesalahan prediksi CO₂ disebabkan oleh 91,06%, selama 10 tahun, karena inovasinya. Studi ini mengintegrasikan sisi lingkungan melalui emisi CO₂ yang mengikuti tren yang disebabkan oleh percepatan aktivitas manusia. Oleh karena itu, penggabungan yang komprehensif antara kebijakan ekonomi dan lingkungan yang memenuhi kebutuhan ekonomi dan memfasilitasi transisi menuju pembangunan rendah karbon di seluruh wilayah sangat penting. Pengembangan kebijakan yang diperlukan untuk mengubah sumber daya SSA dalam waktu dekat, akan memainkan peran besar dalam membentuk pertumbuhan negara SSA di masa mendatang. Kebijakan yang akan membantu dalam mitigasi emisi CO₂ antara lain Mengurangi permintaan lahan pertanian dengan mengintensifkan produksi, mengintegrasikan perencanaan penggunaan lahan pedesaan, menghapus subsidi konsumsi bahan bakar fosil dengan mengadopsi rencana pembangkit listrik yang bersih, dan rekomendasi langkah-langkah peraturan lainnya.

Kata Kunci: Aktivitas manusia, emisi GRK, kebijakan lingkungan, Afrika sub-Sahara, rendah-karbon,

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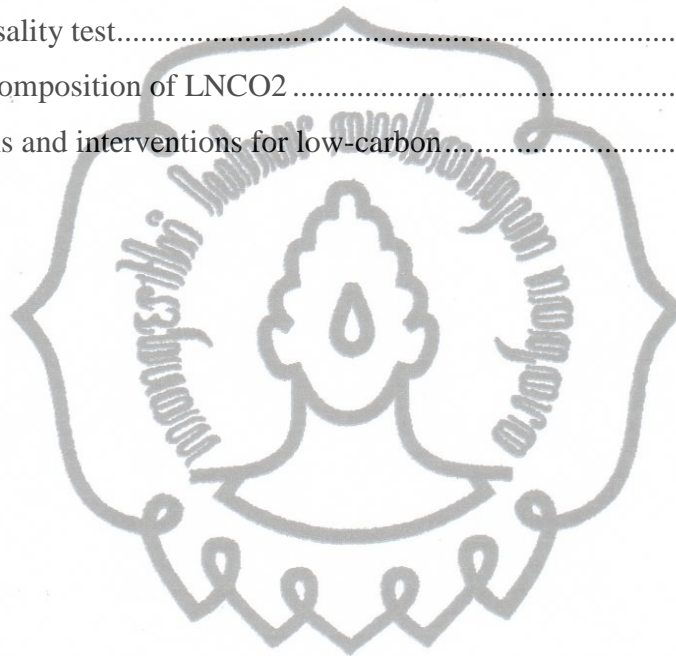
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