بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات : لا يوجد

ANALYZING THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT INDICATORS AND RENEWABLE ENERGY CONSUMPTION

By

Rania Hamed El Sayed Youssef Rashed

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Architectural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

ANALYZING THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT INDICATORS AND RENEWABLE ENERGY CONSUMPTION

Key Words:
Renewable Energy Consumption, Sustainable development Goals, Sustainable development Indicators, Sustainable development Index.

Summary:
The study aims at investigating the relationship between sustainable development indicators and renewable energy consumption utilizing integrated data sets for 255 indicators expressing the sustainable development goals from 137 developed and developing countries. Principal Component Analysis, then Multiple Linear Regression tests are employed to conclude a mathematical model representing the numerical relationship between a set of sustainable development indicators and renewable energy consumption. The statistical analysis results include (i) an inverse correlation between Sustainable Development Index which expresses the dominant factor representing collected data and renewable energy consumption, (ii) a set of sustainable development indicators as the determinants of renewable energy consumption. The findings manifest the importance of the given sustainable development indicators in obtaining a greater increase in renewable energy consumption. Using the concluded mathematical mode, planners and decision-makers can compromise the concluded indicators to attain a serious progressing step towards renewable energy transition aligned with achieving sustainable development.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.
I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Rania Hamed El Sayed Youssef Rashed
Date: / / 2022

Signature:

Dedication

To my father soul, for his endless Love, Support & Encouragement. . .

To my sister soul, who have meant and continue to mean so much to me. . .

Although they are no longer of this world, their memories continue to regulate my life. . .

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Nomenclature

List of Abbreviations

CO2	Carbon Dioxide
GDP	Growth Domestic Product
GHG	Greenhouse Gas
HDI	Human Development Index
MLR	Multiple Linear Regression
PCA	Principal Component Analysis
REC	Renewable Energy Consumption
SPSS	Statistical Package for Social Sciences
SD	Sustainable Development
SDGs	Sustainable Development Goals

ABSTRACT

ANALYZING THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT INDICATORS AND RENEWABLE ENERGY CONSUMPTION

The transition to renewable energy sources remains a major challenge for developed and developing countries. Therefore, the study aims at investigating the relationship between sustainable development indicators and renewable energy consumption utilizing integrated data sets for 255 indicators expressing the sustainable development goals from 137 developed and developing countries. Principal Component Analysis, then Multiple Linear Regression tests are employed to conclude a mathematical model representing the numerical relationship between a set of sustainable development indicators and renewable energy consumption. The statistical analysis results include (i) an inverse correlation between Sustainable Development Index which expresses the dominant factor representing collected data and renewable energy consumption, (ii) a set of sustainable development indicators as the determinants of renewable energy consumption. The findings explain the rapid transformation of low Sustainable Development Index countries towards renewable energy technology by realizing the effective role of using renewable energy as a local solution. Moreover, the findings manifest the importance of the given sustainable development indicators in obtaining a greater increase in renewable energy consumption. Using the concluded mathematical mode, planners and decision-makers can compromise the concluded indicators to attain a serious progressing step towards renewable energy transition aligned with achieving sustainable development.

KEYWORDS: Renewable Energy Consumption, Sustainable development Goals, Sustainable development Indicators, Sustainable development Index.