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Review

A review on Environmental Kuznets Curve hypothesis using bibliometric and meta-analysis

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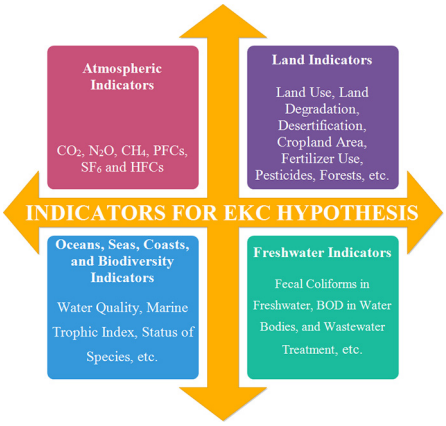
HIGHLIGHTS

- The review examined existing literature on the EKC hypothesis.
- We employed meta-analysis to examine the turning points of income level.
- The bibliometric analysis reveals "China" as the most popular term.
- Meta-analysis reveals a turning point of an annual income level of US$8910.
- Majority of the studies on EKC hypothesis are based on atmospheric indicators.

GRAPHICAL ABSTRACT



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ABSTRACT

The Environmental Kuznets Curve (EKC) hypothesis dates back in decades and is still topical presently due to its importance in environmental policy formulation. There are several systematic reviews of the EKC hypothesis using traditional review method. However, this review employs bibliometric and meta-analysis to track historical trends on the theme using the VOSviewer software and meta-analytic methods. The review translates the network analysis into visualized forms based on authors' contribution, the impact of the research by countries, citations count, and text corpus modeling using a network data extracted from Web of Science. The meta-analysis reveals that the collection of studies that validate the inversed-U shaped relationship has an average of US$8910 as the turning point of annual income level. Low income and middle-income countries are found below the thresholds of annual income level while high-income countries are above. Heterogeneity is confirmed among turning point in studies on EKC hypothesis due to differences in the period of study and econometric methods used in model estimation. The empirical findings reveal that most of the studies on EKC hypothesis are based on atmospheric indicators, while literature is sporadic and limited on EKC hypothesis which employs land indicators, oceans, seas, coasts and biodiversity indicators, and freshwater indicators.

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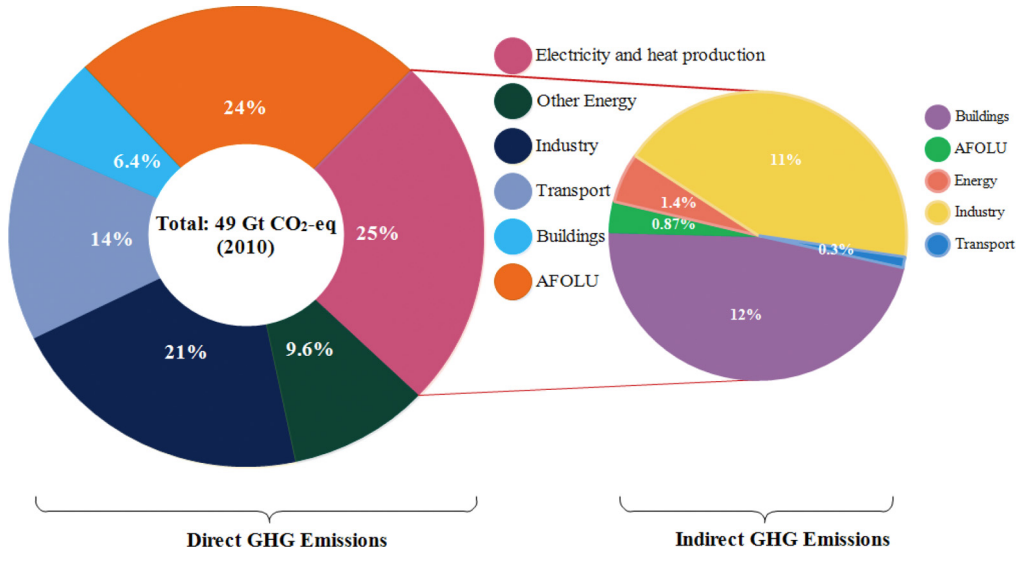
Contents

1. Introduction

Environmental degradation and the decline of environmental quality has become a global concern and has attracted significant attention from development cooperation. Anthropogenic greenhouse gas emissions have risen from 27 $GtCO_2eq$/year to 49 $GtCO_2eq$/year between 1970 and 2010 (see Box 1). According to the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment report, greenhouse gas emissions in 2010 grew by 330% in Asia, 70% in the Middle East and Africa, 57% in Latin America, 22% in Economic Co-operation and Development (OECD) countries, and 4% in Economies in Transition (IPCC, 2014). Several factors affect greenhouse gas emissions ranging from per capita production and consumption growth, population growth, technology, and innovation obsolesce, behavior and infrastructural

Box 1
Breakdown of Greenhouse gas emissions by Trade and Industrial Sectors, Adapted from IPCC 5th Assessment Report.



In accordance with the IPCC 5th Assessment Report, in terms of the contribution by trade and industrial sectors to greenhouse gas emissions, Electricity and heat production is the highest contributor (25%) followed closely by Agriculture, forestry and land use (AFOLU) 24%, industry (21%), transport (14%), other energy forms (9.6%), and buildings (6.4%), respectively.