Investigating the Role of Renewable Energy Use

Subjects: Economics

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The impact of global warming on the economy, population and environment is one of the most pressing concerns of this era. Since the Industrial Revolution, human's increased dependence on fossil fuels has worsened both global warming and climate change. It is feasible to connect the rise of urbanization to both economic growth and the structure of that growth.

Keywords: CO2 emission ; urbanization ; energy utilization ; environment ; trade

1. Introduction

Global warming and climate change have captured the attention of people all around the world. Over the last two decades, substantial research has been conducted into the relationships between economic growth and carbon dioxide emissions, as well as energy utilization. Economic development has been shown to harm the environment and jeopardize environmental sustainability since it is inextricably tied to energy use. Because fossil fuels are a limited natural resource, cities and economies worldwide are finding it increasingly difficult to grow. As advanced countries continue to urbanize, developing economies are projected to have the largest urbanization expansion. If urbanization is shown to have a large and negative influence on CO_2 emissions, it will be simpler to meet the sustainable development goals (SDGs) [1][2]. Energy consumption in urban areas is likely to be driven by environmentally harmful economic activities based on fossil fuels (i.e., transportation and industrial manufacturing). As a consequence of globalization, significant urban density and urbanization may be projected in the coming years. Many emerging countries are undergoing economic transformations that are expanding the urban population. People relocate from rural to urban areas for a number of reasons, including new housing, family size, changes in industrial structure, distribution of city size, and public infrastructure. More people living in cities increases CO_2 emissions and energy consumption [3][4]. The diversification of the economy caused by urbanization leads to an increase in industrial and household energy consumption. It is seen as a means of transitioning from agriculture to a technological, industrial production sector that is strongly dependent on energy and, as a consequence, releases CO_2 emission [5][6].

Extensive urbanization, on the other hand, is a relatively recent phenomenon and one of the most sophisticated economic growth processes. Although there is a substantial association between urbanization and economic growth, it is difficult to identify whether economic development drives urbanization or the contrary. Urbanization, on the other hand, may result in an increase in commercial energy use and CO_2 emissions. Urbanization has been related to deteriorating environmental conditions in both developing and advanced economies. In terms of the environment, urbanization has both positive and negative consequences. It is determined by the extent to which urbanization has impacted the environment [7][8][9]. Energy sufficiency is important to every country’s economic development. It is a trump card that improves a country’s global standing by improving capital and worker productivity and generating alternative energy sources. Because natural resources are seen as one of the primary drivers of economic growth, empirical study on the relationships between different types of energy and economic development has grown in recent decades. Natural gas, oil, coal, nuclear power, and other kinds of energy are being investigated as potential economic drivers in both developed and emerging economies [10][11][12].

Several researchers have come to different conclusions on the influence of international trade on CO_2 emissions due to a lack of consensus on the link between foreign trade and CO_2 emissions. Environmental issues have a direct influence on trade patterns, industrial sites, trade gains, international relations, and manufacturing costs. The pollution haven hypothesis is a theory that investigates the relationship between international trade and CO_2 emissions. According to this theory, when nations with severe environmental regulations open their markets to foreign corporations, enterprises in the developed world may now relocate their operations to the developing world. Trade openness has greatly exacerbated already-existing environmental concerns as a consequence of the accompanying increase in global energy use. CO_2 emissions will rise as a result of the growth of international trade, which necessitates the use of technology that emits CO_2

[13][14][15]. Energy availability is essential to both economic growth and environmental sustainability. To achieve long-term sustainable development, economic growth must first be accelerated.

2. Renewable Energy Use in Global Warming

Global warming is a severe threat to the health and well-being of people all around the world. Increasing usage of fossil fuels has led in grown global warming, and CO_2 emissions have increased dramatically in recent years [16][17]. The Industrial Revolution offered new economic possibilities, but it also gave rise to the well-known phenomena of global warming and climate change. The Industrial Revolution was one of the most major events in human history, transitioning from an organic economy driven by people and animals to one powered by fossil fuels. Climate change is a direct effect of greenhouse gas emissions to the atmosphere caused by the usage of fossil fuels. Climate change and global warming are occurring as a result of this process [18]. SDGs will be more difficult to achieve if energy and environmental policies do not take into consideration the impact of urbanization on CO_2 emissions. If urbanization is shown to have a negative and statistically significant impact on CO_2 emissions, meeting the Sustainable Development Goals (SDGs) may become easier [19].

CO_2 emissions from fossil fuel burning are widely agreed to be the primary cause of human-induced climate change [20]. Different urbanization processes and mechanisms have a significant impact on urban structures and human behaviour, and hence on energy consumption in both established and emerging economies, as well as within impoverished countries. Rural labour is increasingly concentrated in the city's industrial and service sectors as a consequence of the industrialization process, which benefits economic development. Massive emissions from human activities, especially the usage of fossil fuels, are emerging as a main source of global warming and the possible cause of a global climate crisis. Emerging countries' economic progress indicates that they will generate the majority of the world's future emissions [21][22][23]. Many people feel that urbanization will help the economy and enhance people's quality of life; however, it also raises people's energy demand since it increases the need for more energy. The startling rise in CO_2 emissions over the last three decades may be attributable to urbanization, for experts in the area of climate science have given particular emphasis to the connection between urbanization, economic progress, energy utilization, and CO_2 emissions [24][25].

Carbon emission reductions have emerged as a critical policy goal in the battle against global warming. Environmental policy interaction does not exclude trade-related economic activities and foreign direct investment. The link between environmental quality, economic development, and CO_2 emissions is one of the most contentious issues confronting politicians, researchers, and the many developing economies. It's a complicated link that must be addressed if carbon dioxide emissions are to be reduced. Income increases cause a rise in emissions [26][27]. The quantity of CO_2 released is closely related to a country's total energy consumption and energy mix. Urbanization may have varying effects on both. While urbanization is associated with increased per capita income and landscape changes, it also has the potential to increase world energy consumption. Although looking at cities in isolation might give the impression of efficiency gains due to economies of scale, which is due to use of misleading efficiency metrics rather than absolute GHG emissions along the supply chain. Furthermore, the level of human capital is often associated with urbanization [28][29].

Ecosystems that provide food, water, energy, leisure, and clean air are in danger from human activities. Natural carrying capacity has been surpassed by human use of the earth's resources. As a result of people's increasing reliance on water, infrastructure, energy, and food, the environment may be subjected to environmental stressors such as increased emissions and resource depletion. When looking at global warming in a broader perspective, it is important to keep track of the consequences of greenhouse gas emissions, land usage, and deforestation. The ecological footprint may be used to assess environmental sustainability, resource consumption, and management. In addition to being a resource accounting technique, the ecological footprint may be used to assess a country's natural resources [30][31][32]. Energy consumption is a significant driver of economic growth and development since it is a vital component of the industrial process. People's living standards are often higher in countries with higher levels of energy consumption. However, the use of energy results in the release of GHGs emissions such as CO_2 and SO_2. Despite the fact that energy consumption has been a difficult and sensitive topic among environmental economists and policymakers for the last three decades, economic progress and its connection to CO_2 emissions remain the most contentious and delicate issues among policymakers and environmental economists [33][34]. Economic development and urbanization, as well as environmental challenges and climate change, have all increased. As a consequence, governments should coordinate their efforts to promote economic development with measures to protect the environment and battle global warming. In a theoretical paradigm that may be summarized as follows, economics and environmental quality are interwoven. Pollution and degradation increase as the economy develops in its early phases. In contrast, when a specific threshold is achieved, further economic development reduces environmental constraints while improving environmental quality [35][36].

The beginning of the Great Industrial Revolution brought about two of the most significant and long-lasting social transformations: urbanization and industrialization. The great desire of economists to seek high economic growth and well-being underpins this connection between urbanization and industrialization. This interdependence, on the other hand, is both an advantage and a burden for both established and developing economies. To counteract this, growing energy consumption in industry and households has resulted in environmentally polluting outputs such as CO_2 emissions and other greenhouse gases. Urbanization and industrialization have major health repercussions, although the benefits of modernity and better living conditions exceed the dangers [37][38][39]. Growing urbanization has been proved to generate economic progress and enhance people's living standards throughout the globe, but it also has the potential to spark a future energy crisis. Because of the current fossil energy problem, fossil energy is becoming an increasingly scarce natural resource. Furthermore, considerable increases in energy use may accelerate global warming and climate change, two of the most pressing issues confronting the world today [40][41][42].

Global warming is produced by the release of greenhouse gases, which is also a major concern. Greenhouse gases raise global temperatures by trapping too much heat in the atmosphere. Climate change is caused by both human activities and natural disasters. Burning fossil fuels, releasing extreme pollution from factories, and depleting forests have all contributed to the expansion of greenhouse gas levels in the outer climate, which, in turn, contributes to the phenomenon of global warming by retaining extreme heat inside the environment and increasing global temperatures. When compared to other forms of greenhouse gases, CO_2 emission is the most significant contribution to global warming [43][44]. The concerns have been raised regarding the limited supply of fossil fuels, energy security, and environmental degradation that comes with them. The combustion of fossil fuels is a significant contributor to growing greenhouse gas emissions, which are the principal driver of climate change and global warming. Carbon dioxide emissions may be lowered by using renewable energy. Renewable energy can be promoted to replace fossil fuels in order to achieve sustainable development and safeguard the environment. It will also benefit the economy by generating employment and decreasing dependency on foreign resources by expanding the usage of renewable energy [45][46].

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