

Article

An Empirical Investigation on the Transition Process toward a Green Economy

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Abstract: The study investigates the transition process and core principles of a green economy. At a global level, green growth represents the essence of a green economy. In this context, the process of restructuring the market economy and transitioning toward a green economy implies continuous efforts and interdependence since it cannot be achieved in isolation. The model of restructuring economic activities to the specificity of a green economy addresses the interdependent pillars of sustainable development: environmental concerns; renewable energy; low carbon levels. Nevertheless, the green economy model that is applied to advanced economies cannot be implemented to low-income economies because of development gaps. Moreover, emerging economies also have other goals and priorities that demand changes into the green economy model of advanced economies.

Keywords: green economy; sustainable development; low carbon; renewable energy; CO₂ emissions; restructuring model



Citation: Batrancea, L.; Pop, M.C.; Rathnaswamy, M.M.; Batrancea, I.; Rus, M.-I. An Empirical Investigation on the Transition Process toward a Green Economy. *Sustainability* **2021**, *13*, 13151. <https://doi.org/10.3390/su132313151>

Academic Editor: Riccardo Testa

Received: 1 October 2021

Accepted: 25 November 2021

Published: 27 November 2021

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1. Introduction

In the quest for preserving global resources and for ensuring a sustainable growth rate across world economies [1], the concept and principles of a green economy have emerged as a sensible long-term solution. With respect to the process of restructuring the market economy, shifting to a green economy is the most difficult step. This is mainly related to imposing restrictions on the use of natural resources (e.g., mineral resources, forests, soil), regulating energy production and changing consumption habits. In this context, investments in green projects are essential for the efficient preservation and judicious use of world resources.

This study tackles the subject of green economy and the related principles that promote green investments. It is grounded in analyses conducted using indicators retrieved from international databases and reports related to developed, emerging and developing countries from North and South America, Africa, Europe and Asia.

The remainder of the paper has the following structure. Section 2 comprises a brief literature review of the relevant studies focused on the subject of green economy. Section 3 delves into the research framework and provides details on the restructuring model toward a green economy. Section 4 reports the empirical results. Section 5 emphasizes the principles of a green economy that were established based on various international agreements such as the Stockholm Declaration, Rio Declaration, Johannesburg Declaration, Earth Charter, “One Planet Living” Principles, Green Economy Coalition, New Economic Foundation. Section 6 discusses the matter of restructuring economic models in order to meet the requirements of the green economy. Section 7 includes concluding remarks.

2. Literature Review

In the transition process to a green economy, several issues should be taken into account. Firstly, nations should consider the welfare status of future generations when making current decisions about savings and investments that will eventually impact such a welfare status. In order to follow such a rationale, the application of the social discount approach, used in cost–benefit analysis for designing macroeconomic policies, is often suggested. Secondly, environmental degradation must be determined using aggregated indicators stemming from environmental and protection policies. Thirdly, economic growth is fundamentally linked to structural change. In this context, it is difficult to minimize losses while attempting to change the economy structure. Last but not least, achieving the objectives of green economy depends heavily on global initiatives. Moreover, nations that free ride from subscribing to such global approaches pose significant costs on complying nations. As a case in point, the experience of OECD nations with green growth policies and the promotion of a low-carbon, resource-efficient and environmentally friendly quality of life via consumption and production changes [2] can serve as a benchmark.

The literature reports numerous studies conducted on the implementation of green economy principles [3–5] since the present patterns of economic growth and development are unsustainable [6]. A green economy depends on accessing funds and identifying institutions that will carry out and monitor the process of transition to a green economy status. Such institutions can be both private and public; the degree to which private and public institutions get involved in this process differs in terms of the economic development level of a country [7].

There are several definitions for a green economy. According to some views, a green economy is a system of inclusive economic growth, social protection and natural ecosystems in the absence of posing considerable risks and ecological scarcities on future generations [8]. The link between environment and development is possible through sustainable development. In the opinion of Aubertot et al. [9], a green economy is based on restructuring growth and development within the boundaries of global resources. According to Bloomberg [10], a green economy faces the same challenges as the current economy: poverty, exponential population growth, malnutrition, illiteracy [11], implementing agricultural solutions to feed large populations, sufficient power generation, infrastructure development, health management. In the process of implementing green economy principles, there are several stakeholders involved and each of them plays a fundamental role.

3. Research Framework

The concept of green growth assumes achieving economic growth and development by means of managing global resources in a sustainable manner [12–14]. Namely, green growth is grounded in the use of natural resources with minimum pollution and environmental impact [15–19].

The restructuring model of the economy based on green growth principles involves the following aspects [20]:

1. Pricing externalities and valuing natural assets in the long run;
2. Innovation as a means of eliminating unsustainable growth paths;
3. Establishment of new environmentally sustainable growth paths;
4. Creation of win–win situations through sectoral shifts and changes.

Under a green economy framework, the environment can be considered as a natural capital that provides input for production and consumption [21]. In this context, countries such as Colombia, Costa Rica, Ecuador, Guatemala, Paraguay and Peru developed indicators for green growth. Other countries from Eastern Europe, Central Asia and South Asia implemented OECD indicators on green growth, which are mainly based on natural assets, environmental and resource productivity, environmental quality of life, environmental policies and opportunities. Green growth indicators quantify aquatic resources, forest resources, water resources, soil resources and biodiversity.

Currently, the challenges for world economies are threefold:

- Controlling climate change;
- Eradicating poverty;
- Advancing sustainable development goals.

In order to address green growth challenges, multidimensional approaches are required. In this sense, advanced and developed economies should provide lower income and developing countries with financial and technological support. On the other hand, developing economies should carry out the following strategies in the near future:

1. Spurring economic growth;
2. Addressing inequality;
3. Enhancing resilience;
4. Encouraging multiple sustainable development pathways.

In 2014, the Intergovernmental Panel on Climate Change (IPCC), in its final installment of the Fifth Assessment Report, concluded the following [22]:

- the impact of humans on the environment is decisive;
- there is a pervasive and irreversible risk concerning the disruption of global climate;
- it is important to develop additional means in order to limit climate change.

Making the switch toward a green economy involves long-term thinking and investment. Secondly, infrastructure renewal is extremely important in this process. Thirdly, development strategies have to be designed and implemented.

A green economy stems from various policies enacted at a global level, such as the following [22]:

- (a) the formulation of a regulatory framework that promotes green economy;
- (b) a regulatory framework should monitor successes and failures in terms of sustainable development goals and millennium development goals;
- (c) governments should incentivize green investment;
- (d) in regions with decreasing natural capital, mitigating expenditures should be the winning strategy;
- (e) the use of lower taxes and other fiscal discounts to promote green investment and innovation in order to shift consumer preference;
- (f) increase investment in capacity building and training;
- (g) support international governance.

4. Empirical Results

The country sample included three subsamples, as follows: (a) a subsample with ten *developed* and *emerging* economies: Brazil, China, Germany, France, India, Italy, Japan, Spain, UK and the USA; (b) a subsample with four economies from *Eastern Europe*: Czech Republic, Hungary, Romania and Poland; (c) a subsample with ten countries, the vast majority being from *Africa*: Bhutan, Burundi, Chad, Congo, Ethiopia, Guinea-Bissau, Liberia, Mozambique, Somalia and Uganda.

In terms of descriptive statistics, in order to characterize the dataset, we determined the mean, standard deviation and variance for all green economy-related variables, such as: carbon sales, CO₂ emissions per capita, CO₂ emissions annual change, renewable energy consumption and natural resource depletion.

Data Analysis

Data were retrieved from the Low Carbon Environmental Goods and Services (LCEGS) Report for 2011/12 and the World Development Indicators database provided by the World Bank.

Data from advanced and top emerging economies are shown in Table 1.

Table 1. Global LCEGS values for the top 10 countries in terms of CO₂ emissions, renewable energy consumption and depletion of natural resources.

Country	Carbon Sales (Million GBP)	% of Total	GDP (%)	CO ₂ Emissions per Capita Tones 2013	Annual Change % (1990–2013)	Renewable Energy Consumption (% of Total Final Energy Consumption)	Natural Resource Depletion (% of GNI 2010–2014)
USA	660,760	19.2	1	16.4	−0.7	7.9	0.7
China	444,324	12.9	9.5	7.6	5.6	18.4	2.3
Japan	213,295	6.2	−0.1	9.8	0.4	4.5	0.0
India	210,815	6.1	5.2	39	1.6	3.6	2.9
Germany	145,267	4.2	3.7	12.4	9.2	-	0.0
UK	128,141	3.7	1.5	7.1	−1.3	4.4	0.6
France	104,201	3.0	2.1	5.1	−1.0	12.6	0.0
Brazil	103,583	3.0	4	2.5	2.5	43.6	2.5
Spain	92,136	2.7	5	5.1	−0.4	15.7	0.0
Italy	89,485	2.6	0.6	5.7	−1.1	10.9	0.1
Mean	219,200.7	6.36	3.27	11.07	2.38	13.511	0.91
SD	468.188	2.316	1.507	3.173	1.175	3.538	−0.949
Variance	219,199.7	5.36	2.27	10.07	1.38	12.511	−0.09

Source: Our calculations based on data retrieved from LCEGS [23] and the World Bank database [24].

The top ten nations from Table 1 (leading world economies and emerging markets) were selected to define the restructuring model of a green economy. As can be seen from the table, the mean average of the depletion of natural resources was 0.91% of the Gross National Income (GNI), higher than the values of USA, Japan, Germany, France, Spain, the UK and Italy. The only countries exceeding the mean value were members of the BRICS group (Brazil, China and India), which seems reasonable since these economies were heavily geared toward intensive production during the analyzed period.

Data from Eastern European economies are shown in Table 2.

Table 2. Global LCEGS values for four economies in the upper income group from Eastern Europe in terms of CO₂ emissions, renewable energy consumption and depletion of natural resources.

Country	Sales (Million GBP)	% of Total	GDP (%)	CO ₂ Emissions per Capita Tones 2013	Annual Change % (1990–2013)	Renewable Energy Consumption (% of Total Final Energy Consumption)	Natural Resource Depletion (% of GNI 2010–2014)
Romania	11,955	0.3	1.1	3.5	−2.7	21.7	1.0
Poland	29,526	0.9	5	7.9	−0.8	11.1	0.7
Czech Republic	11,444	0.3	1.8	9.4	–	10.9	0.1
Hungary	10,081	0.3	1.7	4.2	−2	10.2	0.3
Mean	15,751.5	0.45	2.4	6.25	1.3	13.475	0.525
SD	125.5	−0.742	1.183	2.291	0.548	3.532	−0.689
Variance	15,750.5	−0.55	1.4	5.25	0.3	12.475	−0.475

Source: Our calculations based on data retrieved from LCEGS [23] and the World Bank database [24].

With respect to the Eastern European countries included in the sample, the mean average of depletion of natural resources was 0.525% of the Gross National Income (GNI). The value was surpassed only by Romania and Poland during the analyzed period.

Table 3 contains data from ten countries, the vast majority being from Africa. In this case, the mean average of natural resource depletion was 14.83% of the Gross National Income (GNI). In comparison with the previously analyzed countries, these economies registered the highest levels of natural resource depletion. The outcome can be explained by the fact that these low-income countries count on the exploitation of their natural resources in order to generate income that is fully dependent on agriculture. Moreover, the depletion of such resources occurs at a faster pace than in other countries because of the gap in terms of infrastructure, electricity facilities and technological advancement.

Table 3. Low-income countries in terms of CO₂ emissions, renewable energy consumption and depletion of natural resources.

Country	CO ₂ Emissions per Capita Tons 2013	Annual Change % (1990–2013)	Renewable Energy Consumption (% of Total Final Energy Consumption)	Natural Resource Depletion (% of GNI 2010–2014)	HDI
Burundi	0.0	−2.7	96.6	13.8	184
Congo	0.0	−4.7	96	31.8	176
Somalia	0.1	14.1	94.2	8.6	-
Ethiopia	0.1	2.6	93.5	11.2	174
Chad	0.0	2.8	90.6	13	186
Uganda	0.1	5.0	90.3	11.5	163
Bhutan	1.2	7.1	90.0	16.9	132
Liberia	0.2	−0.1	89.4	27.4	177
Guinea-Bissau	0.1	−0.5	88.6	12.3	183
Mozambique	0.2	3.0	88.4	1.8	181
<i>Mean</i>	0.2	4.26	91.76	14.83	172.88
<i>SD</i>	−0.894	1.806	9.527	3.719	13.111
<i>Variance</i>	−0.8	3.26	90.79	13.83	171.889

Source: Our calculations based on data from LCEGS [23], the Human Development Report [25] and the World Bank database [24].

According to LCEGS [23], three dimensions pose challenges and, at the same time, offer opportunities in the process of transitioning toward a green economy: environmental, renewable energy, low carbon. With respect to the environmental dimension, the issues that must be addressed are the following: air pollution, contaminated land, environmental consultancy and monitoring, marine pollution control, noise and vibration control, recovery and recycling, waste management, water supply and wastewater treatment. The renewable energy dimension is related to the following: biomass, geothermal energy, hydro energy, wind power, renewable consulting, etc. Last but not least, the low-carbon dimension is closely connected to aspects such as: additional energy sources, alternative fuels, building technologies, energy management, carbon capture and storage, carbon finance and nuclear power.

5. Principles of Green Energy

Emission trading is an important instrument of emission reduction [26]. In this context, emission trading rights are offered under cap-and-trade rules in order to decide the emissions quota. Moreover, emission trading can be performed through reduction certificates granted by the Clean Development Mechanism [27].

There are several green investment banks, such as the UK Green Investment Bank, China Development Bank, Inter-American Development Bank, International Financial Corporation, BRICS Development Bank and Asian Infrastructure Investment Bank.

Established in 2012, the Green Investment Bank was the world's first investment bank focused on this initiative and has financed green projects worth GBP 10 billion

since its appearance on the market, supporting 30 green projects in total. According to the Carbon Tracker Initiative [28], through its investments, the bank facilitated the production of 20.3 TWh of renewable energy, which had the potential to power 4.9 million homes worldwide, and prevented 4.8 million tons of CO₂ from polluting the atmosphere, equivalent to the pollution caused by 2.2 million cars.

Green bonds growth was largely attributed to world economies' orientations toward green finance since long-term investments were essential for this purpose. Green bonds have a finite period of maturity. Governmental authorities can invest in green bonds for other sectors as well, aside from green economy projects, since these investments have a positive impact on the job market and generate increases in the national GDP.

Restructuring the economy following a green economy approach demands structural reforms of credit institutions (central banks, commercial banks, investments banks, etc.). For this reason, the support of credit institutions is vital since investments in sustainable business activities can mitigate carbon emissions, and generate green growth and economic development [29]. In 2012, the Sustainable Banking Network was established to promote knowledge sharing among members. By 2017, there were already 37 countries within the Sustainable Banking Network, which were willing to support and promote green finance initiatives.

The principles of a green economy stem from various sources such as: the Stockholm Declaration, Rio Declaration, Johannesburg Declaration, Earth Charter, "One Planet Living" Principles, Green Economy Coalition, New Economic Foundation, along with other international agreements. There are fifteen such principles [30]:

- Equitable distribution of wealth;
- Economic equity and fairness;
- Intergenerational equity;
- A precautionary approach;
- The right of development;
- Internalization of externalities;
- International cooperation;
- International liability;
- Information, participation and accountability;
- Sustainable consumption and production;
- Strategic, coordinated and integrated planning to deliver sustainable development; and green economy, and to eradicate poverty;
- Just transition;
- Wellbeing;
- Gender equality;
- Safeguard biodiversity and prevent environmental pollution.

Many economies around the world implemented the green economy principles. Some countries updated their tax regimes and enacted green taxes in order to control emissions and finance innovative green projects [31–33]. In addition, countries established standards regarding the limitation of green gas emissions during business activities. It goes without saying that all stakeholders and the civil society should be consulted when setting such mandatory limits.

In the United Kingdom, almost one-third of the biomass comprising food, fibers and biofuels is imported with the purpose of reducing emissions [34] and not affecting the ecosystem. Moreover, the UK imports 45–60% of its oil and 70% of the natural gas to reduce emissions [35]. In the period 2010–2011, over 110,000 new jobs were created in the country in relation to green economic activities.

Barbados identified five core sectors to achieve a transition to a green economy: agriculture, fishing, construction, transportation and tourism. As a small Caribbean island, Barbados faces two challenges regarding the price fluctuations of imported fossil fuels and the impact of climate change on its coastal ecosystems. According to Green [36], the

country is focusing on investment, development, technological advancement, strength of institutions and good governance.

South Africa also supported the green economy initiative by signing the Green Economy Accord in 2011. The main purposes of this important agreement were the following: job creation, technological innovation, and the involvement of government authorities, companies and citizens alike in the protection of the environment. Aside from South Africa, other countries from the BRICS group joined this agreement.

Jordan supports key projects related to energy, water, transport, waste management, agriculture and tourism [17,18]. Nepal aims to protect its natural resources and mitigate poverty levels in the country via green economy initiatives [37]. At the same time, countries such as Canada also favor green economy projects that will generate important financial resources [38].

In 2007, the state of Borneo, a small South Asian country, signed the Heart of Borneo (HoB) Declaration, together with Indonesia, Malaysia and Brunei. The purpose of this jointly signed document was the conservation of the biodiversity, ecosystems and natural resources of the countries. Among the strategies selected for this purpose, one could find ecosystem services, renewable energy incentives and public–private partnership programs for conservation. Moreover, the declaration mentioned the importance of establishing capacity building measures in order to train skills and knowledge sharing through the Green Economy Centre of Excellence, HoB Partnership Forum, Green Growth Generator and Sustainable Finance Facility for Green Growth [39].

African Initiatives on Economic Development

Several initiatives were consistently pursued on the African continent with the purpose of achieving growth and development. The following paragraphs list some of the most relevant initiatives in recent decades.

The Monrovia Declaration of 1979 aimed to achieve a high degree of self-sufficiency and a democratic national development through solidarity among citizens. The Lagos Plan of Action of 1980 aimed to promote self-reliance and self-sufficiency through development, equity in wealth distribution, expansion of the public sector, and inter-African economic cooperation and integration. The Final Act of Lagos (1980) became the Abuja Treaty of 1991 and established the African Economic Community, a common market across the continent.

In 1985, the Organization of African Unity Assembly adopted the Economic Recovery Program. Later on, the United Nations changed the name of the program into the Action of African Economic Recovery and Development, which was implemented in the period 1986–1990.

Economies on the African continent are constantly growing. For this reason, countries on the African continent generated 32% of their GDP from natural resources [7] in the period 2000–2008. The remainder of the GDP was generated by transportation, telecommunications and manufacturing. Since 2000, due to increases in oil and mineral prices, the GDP has experienced an ascending trend. As a case in point, in 1999, the oil price per barrel was USD 20 and, in 2008, this value increased to USD 145. African countries host 40% of global gold resources, 10% of global oil resources, and 80–90% of global mineral reserves of chromium and platinum.

The fast urbanization across the continent resulted in multiple private investments in infrastructure development. In the period 2006–2008, for instance, investments in infrastructure tripled, reaching up to USD 19 billion.

Egypt, Morocco, South Africa and Tunisia diversified their economies and have achieved consistent GDP growth rates since 2000. Seventy percent of GDP was generated by industries such as banking, constructions, retail and telecommunications. One-third of this GDP was generated by oil-exporting countries (e.g., Algeria, Angola, Chad, Congo, Equatorial Guinea, Gabon, Libya and Nigeria). On the other side of the spectrum, low-income countries such as Cameroon, Ghana, Kenya, Mozambique, Senegal, Tanzania, Uganda and Zambia diversified their economies at a slower pace. In these countries,

35% of GDP was generated from agriculture and the use of natural resources, while the remainder was generated via exporting processed fuels and food, chemicals or apparel. Other countries such as the Democratic Republic of Congo, Ethiopia, Mali and Sierra Leone have registered average GDP growth rates of 7% since 2000 [7].

6. Restructuring Models for Green Economy

In 2005, during the Fifth Ministerial Conference on Environment and Development (MCED) organized at Seoul, and with representatives from 52 governments and stakeholders from Asia and the Pacific, it was stated that the green economy model was beyond sustainable development. A green economy became an important regional initiative that aimed to achieve the Millennium Development Goals (especially goals 2 and 7 concerning poverty reduction and environmental sustainability) [40].

In 2008, South Korea adopted the restructured model of “low carbon green growth” and implemented the National Strategy for Green Growth and the Five-Year Plan for Green Growth.

In 2009, thirty members and five prospective members of the OECD Ministerial Council Meeting, which accounted for 85% of the global economy, established that a green economy was an adequate approach in the near future. In 2010, during the Association of Southeast Asian Nations (ASEAN) summit organized at Hanoi, participating countries adopted the “Sustained Recovery and Development” Plan to promote green growth by long-term investments in environmental sustainability and a sustainable use of natural resources. The G20 Seoul Summit organized in 2010 recognized that green growth was an inherent part of sustainable development.

Moreover, the OECD has recommended the adoption of green growth strategies, which are focused on preventing environmental degradation and the inefficient use of sources while combatting climate change. According to the OECD, green growth is defined as an initiative that promotes economic growth and development while ensuring the availability of natural resources for the wellbeing of citizens [12–14].

Multiple actions were proposed to achieve the goals of the green economy, namely: promoting investment in innovation and R&D, using technological advances across the entire industry, promoting the creation of new companies, and transitioning to a green economy via small and medium-sized enterprises. Among the other strategies chosen, the following are worth mentioning [41]:

- Imposing high taxes on pollution;
- Reforming and rationalizing subsidies for environmentally harmful economic activities;
- Developing skills that were fit for the labor market;
- Promoting private investment in green infrastructure technologies;
- Increasing green consumption knowledge and behavior.

A green economy is considered a tool to achieve sustainable development and it links economic activities to development levels. There is no specific model on restructuring economic activities toward a green approach. In terms of the standard model of economic growth, generating income facilitates industry growth, business and trade. In addition, the market economy promotes competition and the elimination of poor performance, while company profit is the main type of incentive. Nevertheless, this economic growth model has not benefitted large populations. For this reason, there are 1.3 billion people in the world who do not have electricity, 2.6 billion people who do not have sanitation and 900 million people who do not have clean drinking water [15].

According to the European Environment Agency [42], a green economy aims to achieve wellbeing for citizens through sustainable natural ecosystems. Moreover, the efficient use of natural resources can be ensured without notable environmental impacts and can secure economic prosperity. The European Union aims to reduce its greenhouse gas emission levels by 40% before 2030 and by 80–95% before 2050, as compared to the 1990 level. In addition, all developed countries aim to cap the global mean temperature rise by no more than 2 degrees Celsius. Developing nations will also contribute to this

reduction so that, by 2050, global emissions will be mitigated by 50%. In this sense, the United Nations Framework Convention on Climate Change (1992) and the Kyoto Protocol are regulating agreements on greenhouse gas emissions. In December 2019, EU members agreed to phase out hydrochlorofluorocarbons (HCFC) and, as a consequence, they stopped producing HCFC.

The EU focused on various environmental and resource policy issues, such as the following:

- energy;
- greenhouse gas emissions and ozone-depleting substances;
- air quality and air pollution;
- transport sector emissions of greenhouse gases and air pollutants;
- waste;
- water;
- sustainable consumption and production;
- chemicals;
- biodiversity and land use.

A focus on green economy is expected to reduce losses in life expectancy by 47%, mortality levels from exposure to polluted air by 10%, acid deposition levels in forest areas by 74% and losses of freshwater sources by 39%. Such aims are attainable only on the condition that sulphur dioxide emissions are reduced by 83%, nitrogen oxides emissions by 60%, volatile organic compounds by 51% and ammonia by 27%.

The EU has also adopted certain policy initiatives to reduce transport emissions that cause greenhouse gases and other air pollutants. Two such initiatives are to reduce by 50% the number of conventionally fueled cars until 2030, and to completely replace all the existing cars with electric models until 2050. Thirdly, the EU aims to shift 30% of road freights, which travel distances of over 300 km, to water or the railways by 2030, increase this rate to 50% by 2050. Fourthly, the EU aims to shift medium-distance passenger transport to the railways by 2050. Fifthly, EU members plan to reduce by 20% the CO₂ emissions from transport until 2030 (as compared to 2008), and by 60% before 2050 (as compared to 1990). Sixthly, they request that urban cities implement CO₂-free transport by 2030. Seventhly, they aim to reduce the carbon fuels of airline companies by 40% before 2050. Last but not least, the EU plans to reduce the CO₂ emissions from ships by 40% before 2050 (as compared to 2005).

In 2000, after 10 years of preparations and negotiations, the EU Water Framework Directive was published in the Official Journal of the European Community regarding water protection policies.

The EU also formulated certain non-binding objectives with respect to sustainable consumption and production [43], such as the following:

1. Removing environmentally harmful subsidies;
2. Imposing environmental taxes to increase public revenues;
3. Providing incentives for healthier and more sustainable food production;
4. Reducing the input within food chains by 20%;
5. Reducing the disposal levels of edible food waste by 50%;
6. Decoupling economic growth and wellbeing from resource input;
7. Achieving economic growth until 2050 following the requirements of resource constraints;
8. Managing resources (raw materials, energy, water, air, land and soil) in a sustainable manner.

According to the EU Sustainable Development Strategy [44], manufactured, handled and used chemicals (including pesticides) should not be harmful to human health and the environment.

In 2002, the Convention on Biological Diversity concluded that the reduction in biodiversity should be stopped at the global, regional and national level. In 2006, the EU adopted its Biodiversity Action Plan to monitor biodiversity reduction.

The EU revised its priorities in the Seventh Environment Action program by focusing on target domains such as the eutrophication of terrestrial ecosystems, efficient manage-

ment of resources and ensuring outdoor air quality in urban areas [45]. The program also promoted the conservation of natural capital. Nevertheless, the program has certain limitations. First, the application of the program is limited only to the European Union. Second, climate change and global warming are not exclusive to the European Union alone but are global problems. Third, the wellbeing of EU members should not be achieved through the environmental degradation of world resources. Fourth, the achievements regarding environmental protection within the EU will be insufficient to mitigate pollution levels outside the EU in the long run.

During the period 2007–2014, all regions, except Asia, registered decreases in economic growth after the global financial crisis [46]. Nonetheless, despite considerable income decreases, welfare expenditure across countries remained constant. For this reason, certain welfare expenditures were fixed and did not vary with economic growth. In the Sub-Saharan region, welfare expenditures are financed through international financial assistance. In the aftermath of the 2008 global financial crisis, the flow of international assistance and aid declined. Welfare tends to remain constant unless governments attract more investment. Healthcare depends upon available income and there is a direct link between the quality of healthcare and life expectancy.

Economic markets and institutions follow inclusive and exclusive principles and practices. Inclusive principles advocate for collective wisdom in economic activities. Exclusive principles have the purpose of distinguishing between several approaches to certain problems. From the perspective of sustainable development, inclusive principles become exclusive principles and vice versa. In this context, exclusive principles are related to a green economy, while inclusive principles are related to green growth.

In 2012, the UNEP, the World Bank and OECD organized the Rio+20 Conference where they advocated for the necessity of a green economy as a new approach across world economies. At the same time, the UNEP has strived to implement the green economy paradigm.

7. Conclusions

The present article addresses the topic of a green economy and the need to restructure the standard models of economic growth, starting from various principles of green economy. Hence, while aiming to increase productivity, government authorities should also target an efficient and equal distribution of resources in order to achieve sustainable development goals regarding poverty reduction and citizens' wellbeing [47].

In such a green economy that facilitates the implementation of the Paris agreement and other international agreements, one major goal is to mitigate the effects of global warming and climate change by considerably reducing greenhouse gas emission levels. Moreover, a green economy promotes innovative and efficient solutions in terms of renewable energy sources. A green economy is consistent with scientific and technological developments in the quest to reduce the burden on conventional energy and natural resources.

The solutions proposed through implementing green economy initiatives across developed, emerging and developing economies from North and South America, Europe, Africa and Asia involve substantial mitigations in terms of greenhouse gas emission levels, global warming and a judicious use of global resources. Applying such solutions will benefit not only the wellbeing and living conditions of the current populations, but also the wellbeing of future populations.

Author Contributions: Conceptualization, M.M.R.; methodology, M.M.R.; validation, M.C.P.; formal analysis, M.M.R.; resources, M.-I.R.; data curation, I.B.; writing—original draft preparation, M.M.R.; writing—review and editing, L.B. and I.B.; visualization, M.C.P. and M.-I.R.; project supervision, I.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Babeş-Bolyai University, grant number GS-UBB-FSEGAPop CiprianMarcel.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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