Circular Economy and Sustainable Development Goals

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ABSTRACT

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Although governments, businesses, and organisations representing civil society have all shown an interest in helping to accomplish the Sustainable Development Goals, doing so is not always simple. Sustainability and the circular economy (CE) are connected but distinct concepts-While sustainability seeks to balance the use of non -renewable resources with their rising consumption, CE which may be the only sustainable economic model for the future aims to increase the productivity of the productive process by minimising, reusing, and recycling as many of the by-products as is practical. The aim of this paper is to present the solution by bringing in the concept of Circular economy and the Sustainable development goals. And to inform the various stakeholders about the importance of the circular economy as a tool to accelerate progress toward the Sustainable Development Goals.

Keywords: Circular economy, Sustainability, Sustainable Development Goals

Introduction: The sustainability of the earth is threatened by a number of factors, including deforestation, energy shortages, biodiversity loss, poverty, and inequality. Natural resources are scarce, and the capacity of the ecosystem to absorb waste from rising non-renewable energy and raw material use is in jeopardy. Numerous studies link human activities to these problems. It is obvious that maximising the effectiveness of human resource use is now a top priority given that, in 2014, the natural resources we consume each year required the regenerative capacity of 1.5 planet Earths, and that the world's population and consumption levels are currently rising.

The fundamental cause of the issue is human activity, so society must try to overcome these conflicts by sensibly and intelligently rethinking the market economy and production model currently in place. Institutions, societies, and organisations have taken a number of actions in an effort to address the problem and achieve more sustainable development, which is defined in the Brundtland report as "development that meets the needs of the present without jeopardising the ability of future generations to meet their own needs." There are numerous techniques related to this goal, but only the Sustainable Development Goals (SDGs) and associated 2030 Agenda, transforming our World, have the power to spark the essential changes on a global scale. To achieve sustainable development, organisations must be more actively involved. Additionally, economic and production systems that support this type of development must be implemented. These strategies must be added to the overarching framework. This makes the circular economy one of the most useful models for bringing about systemic change.

In order to adequately define the scope of the investigation, researchers have chosen just one meaning of the phrase "circular economy" from among the many that are available. After analysing 114 distinct definitions to come up with the chosen term, Kirchherr, Reike, and Hekkert came to the following conclusions:

“A circular economy is an economic system based on business models that replace the idea of "end-of-life" with methods for reducing, alternatively reusing, recycling, and recovering resources in both consumption and production processes, operating at the micro scale (products, companies, and customers), meso level (eco-industrial parks), and macro level (city, region, nation, and beyond), with the goal of achieving sustainable development, which necessitates creating New business strategies and cautious consumers make it possible.

The circular economy ought to be the preferred economic model, so it makes sense to consider it a tool towards achieving the sustainable development goals, which has been defined as economic growth that is harmonious with such a sustainable future.

Agenda 2030 provides a framework to attain this utilising the Sustainable Development Goals.
The new circular economy model seeks to achieve both environmental sustainability and social equality. The circular economy may be the only sustainable economic model for the future since it decouples economic growth from resource consumption, establishes international standards for product sustainability, limits resource use to the planet's carrying capacity, and encourages material recycling. Long-term, it might result in a healthier world and a wealthier human race; however, in the very near future, it might also result in new job opportunities and business models.
Beyond material consumption, the circular economy can help reduce activities that damage the air, water, and land and release greenhouse gases. It can also contribute to the creation of a more just and equitable world by ensuring that minorities have equal access to resources and a variety of safe, respectable professions. While there is a clear connection between circularity and some SDGs, particularly those that deal with the environment or the economy, its relationship with other SDGs also raises the possibility of great potential: when implemented globally and holistically, a circular economy can help achieve the SDGs.
The necessity to promote deeper understanding, skill development, and knowledge growth for the circular economy's less well-known social dimensions - which should include a circular society - is only highlighted by this. One should take into account how to meet the requirements of everyone with the resources one has while developing and implementing circular strategies, in addition to how to shut loops on material resources.

This study examines circular economy and share similar characteristics it to the SDGs in depth to find evidence that supports or negates the existence of a qualitative relationship between both the implementation of circular economy and the attainment of the SDGs. The study views the Sustainable Development Goals as a key catalyst for change for use by public authorities, businesses, as well as citizens in achieving sustainable development, and seeks to highlight the factors that are helpful in achieving these goals.

Linking CE and SDGs-

The literature on CE and SDGs is searched, arranged and analysed using a descriptive literature review approach. The use of narrative reviews is common in the area of development studies. Narrative review of literature is useful for connecting studies on various themes, and although they lack the rigour of systematic reviews. This is especially true when trying to reinterpret or show linkages between studies, as did in this study. In order to find academic and non-academic material on CE and the SDGs, a keyword search was conducted using online search engines Google and Google Scholar, academic databases Scopus, and search engines of academic publishers Wiley Online Library and ScienceDirect.

Definition of Circular economy concepts-

An industrial system which is restoring or regenerative by purpose and design is known as a circular economy. It substitutes the idea of end-of-life with restoration, moves toward the utilization of renewable energy, and forgoes the use of harmful chemicals that impede reuse and biosphere re-inhabitation. Through the improved design of the materials, products, systems, and business models, it seeks to eliminate waste.

The circular economy is based on the four principles which are-

- **Waste=food**, meaning there is nothing like the concept of waste in the circular economy. What is considered waste for one is considered as the food for the other organism.
- **Build Resillience Through Diversity,** meaning being able to change while continuing to develop. Greater biodiversity contributes to the general health of the system.
- **Energy From Renewable Sources**, meaning the focus should be on the usage of the renewable sources of energy.
- **Think in System,** meaning numerous actors working together to creative and effective flows of material and consumption.

It establishes a clear distinction between a product's consumable and durable parts. The majority of the consumable in the circular economy are made of biological components that really are non-toxic and perhaps even beneficial. They may be safely recycled into new products or used repeatedly before being returned to the biosphere. Contrarily, durables like computers and motors are built of technical materials like metals and the majority of plastics that are not suited for the biosphere. Both of these go to further reduce resource dependence and boost system resilience, the energy needed to power this cycle ought to be renewable by nature.

The idea of a consumer is replaced with that of a user, necessitating the formation of a new contract amongst companies and their clients based on the performance of their products. Wherever possible, the durable goods are leased, rented, or shared. If they are purchased, there are agreements or incentives in place to guarantee the product's return and subsequent reuse. The circular economy does have the ability to boost output, generate employment, lower carbon emissions, and protect priceless raw materials. It offers a means of producing value. Building knowledge and capability in the circular economy is the challenge, prone to rapid technological advancement are created with the goal of being upgraded.

Benefits of circular economy for economy, environment and employment.

Economy- Despite the emphasis on technical solutions, academic research, grey literature, and pertinent reports indicate that CE approaches may result in significant cost reductions and employment creation. Creation, innovation, productivity, and resource efficiency are increasing in both wealthy and developing nations (Yuan et al. 2006; Friends of Europe 2014; Ellen MacArthur Foundation 2015; Gower and Schroeder 2016). The estimated benefits are of a large order. By 2030, according to the Ellen MacArthur Foundation, a CE may result in a €600 billion yearly reduction in net hard - earned cash in the European Union (EU), a 3% annual increase in resource productivity, and a €1.8 trillion annual net benefit. Despite these encouraging financial advantages, just 6% of the materials processed by the world economy are recycled so far and help close the loop. Although the EU economy's level of circularity—roughly 13% of processed materials—is half as high as that of the global average, it is still low.

Environment- By structuring manufacturing in accordance with CE principles, reducing waste, and increasing material reuse and recycling, Sweden may become approximately 25% more energy efficient and enhance overall material efficiency by 25%. As per Ecofys and Circle Economy (2016), global CO2 emissions could be reduced by up to 7.5 billion tonnes through the use of CE practises like chemical leasing, nutrient recovery in agriculture, material substitution in the construction industry, and joint ownership models in transportation systems. This would close half of the current emissions gap, allowing to adhere to the Paris Agreement's 1.5°C objective.

Employment- Regarding employment, the CE in France is equivalent to about 800,000 full-time positions, or 3% of the overall labour force. According to Morgan and Mitchell (2015), the UK could create 517,000 new skilled employment by 2030 under a "Transformation" scenario with substantial growth in reprocessing (up to 85%) and remanufacturing (up to 50%), as opposed to just 31,000 low-skilled jobs under a "No new initiatives" scenario. By 2025, the European Environment Bureau predicts employment opportunities in the European CE sector ranging from 634,769 (in a modest scenario) to 747,829 (in an ambitious scenario). At the same time, it was determined that the lack of CE programmes at all educational levels and the skills deficit in the workforce were the two main obstacles to converting the linear to a CE

Literature review-

1- Ana Birliga Sutherland(2019); Circle Economy

The article demonstrates how the circular economy can assist governments in achieving the Sustainable Development Goals, which serve as a critical road map for sustainable development, and advance efforts toward a safe, just, and peaceful world for all. Reducing resource extraction and keeping warming to 1.5 degrees has been proposed as a way to alleviate ecological disintegration. Circularity, a paradigm shift, refers to a system where waste is eliminated, material value is kept to the maximum extent possible, and nature is renewed. Practitioners are now critically investigating how a CE with social and ethical issues at its core could open the door to a brighter and more inclusive future for everyone. If properly managed, the CE approach has the ability to produce new, well-paying jobs, enable more equitable resource management, prevent societal crises, and promote resilient local economies.

2-Jindal public Business school(2016)- The proposed Digital Circular Economy for Sustainable Development Goals Center (DCE-SDG) is shown in the report (focussing on Business, Society and Nature). This proposed development project is based on a basic understanding of the center's mission, vision, and objectives, taking into account the five major pillars (P1-P5).

3-Juan manuel (2019);Circular Economy as a Catalyst for Progress towards the Sustainable Development Goals: A Positive Relationship between Two Self-Sufficient Variables– the proposed study focuses on how both the concepts of

circular economy and sustainable development are inter related and what are its scope if both the concepts are taken care by the share holders.

Objectives-

1. To study the concept of Circular economy.
2. To study the importance of CE.
3. To study how Sustainable development goals are related to CE.

Research Methodology-

This study is very useful to know about the Circular economy as by 2050, India's adoption of a circular economy will generate $624 billion in benefits annually and cut greenhouse gas emissions by 44%. Therefore, the circular economy is essential for maintaining the environment's quality and developing a system of incentives for recycling electronic devices. This study also focuses on how the circular economy is related to sustainable development goals and how it can be helpful to achieve the same.

Methodology-

A method based on heuristics created by Polya was chosen since there isn't just one scientific approach; rather, there are numerous scientific ways to comprehend reality. In this qualitative methodology, the study question: Is there a beneficial relationship between the adoption of a CE and the Sustainable Development Goals is addressed through an analysis of the information gathered.

These steps are included in the study in order to adhere to this methodology:

- The goal of the study is to establish the link between CE and advancement toward the SDGs.
- The connection between CE and the SDGs.
- The results will be discussed to determine the concept's future.

In order to understand how the two concepts are interconnected and how it would shape the future of business, it is important to understand the relationship between the circular economy and sustainable development goals. The concept can provide prospects for the industry if it is fully understood.

Link between CE and SDGs-

A sizable number of SDG targets can be achieved by using CE practises as a "toolbox," or set of techniques.

1- SDGs directly benefitting from CE practices-

The study found that putting CE practises into practise can directly help achieve 21 SDG targets The following have the greatest influence CE linkages and synergies:

- SDG 6 - Clean Water and Sanitation: Environmentally friendly practises (ECE) like small-scale water treatment, sustainable sanitization, wastewater treatment, water reuse and recycling nutrient recovery, biogas systems, etc. can greatly boost access to clean drinking water and equitable sanitation, lower pollution, and improve water quality.

- Affordable and clean energy is one of the Sustainable Development Goals (SDG) 7, and it is supported by renewable energy systems, including small-scale biomass technologies and second-generation biofuels, energy (heat) recovery, and improved industrial system utilisation (such as industrial symbiosis).

- New circular business models are a potentially significant source of increased resource efficiency and effectiveness waste valorisation, and green jobs, which is a component of SDG 8 – Decent Work and Economic Growth. According to numerous additional estimates, the global possibility for CE implementation is in the multi-trillion Euro range, with a net benefit of EUR 1.8 trillion per year.

- SDG 15 - Life on Land: The goal of restoring natural capital lies at the heart of CE activities. This entails implementing sustainable and regenerative farming and agroforestry methods, which are essential for recovering terrestrial ecosystems. These practises embrace and safeguard biodiversity and return biological material to soils as nutrients.

2- SDGs indirectly benefitting from CE-

- SDG 1: "No Poverty": The creation of jobs through the adoption of CE practises like repair, remanufacturing, and recycling can help to indirectly reduce poverty. Resilience is also increased through CE practises, such as those pertaining to agriculture and water management. Strong connections exist between SDGs 8 and 9.

- Implementing CE concepts in local agriculture, such as composting and diverse integrated farming practises, improves soil, which raises agricultural

productivity and system resilience, in line with SDG 2: Zero Hunger. Farmland can be made available for human consumption when coupled with circular food chain initiatives that address these issues and/or cascade food waste into animal feed.

• Sustainable Cities and Communities SDG 11: A shift to a circular economy is essential to lowering cities' resource and ecological consequences because it is predicted that three-quarters of the world's population would live in cities by 2050. Additionally, CE principles like modular, adaptable, and adaptable building design can aid in facilitating low-income populations' housing access.

• SDG 14 - Life below Water: By using CE practises, land-based activities can be prevented from generating pollution and leaking waste into the oceans. Prior to entering the oceans, this also includes the recovery of minerals from waste water streams. The contribution of CE to combating climate change will also indirectly lessen ocean acidification.

3- SDGs facilitating the uptake of CE practices-

• SDG 4 - Quality Education: Enabling circular practises requires efforts toward a number of the targets related to, for example, equal opportunities for technical, vocational, and tertiary education - especially when combined with a concentrate on CE, systems thinking, layout for circular logic, entrepreneurship, and innovation.

• SDG 9 - Industry, Innovation, and Infrastructure: Achieving targets under this goal is crucial for establishing a CE, even though CE practises will directly contribute to upgrading industries to make them better resilient and sustainable. Reverse logistics, new infrastructure for renewable power, circular waste and water management, support for research and innovation, and ensuring access to proper funding are all included in this.

• SDG 10: Lessening Inequalities Promoting safe working conditions has strong synergies with social and economic inclusion; this is crucial, especially for those employed in the unregulated trash sector in developing nations. This objective also pertains to ensuring that poor nations are fairly represented in international cooperation, that they have equal access to scientific assistance and funding for CEs, and that trade agreements enable equal system rather than working against it.

• SDG 13 - Climate Action: CE practises help to mitigate climate change and boost resilience both directly and indirectly. According to the 2019 Circular Gap Report, in addition to currently available low-carbon technology, applying CE practises may reduce greenhouse gas emissions by more than one third by 2100. Additionally, accomplishing national, regional, or local climate policy goals, providing incentives and financing options, and raising public knowledge of climate change are likely to encourage the adoption of CE practises.

• Peace, Justice, and Strong Institutions (SDG 16): With the aid of CE practises, better and much more equitable access to basic supplies as well as higher natural system resilience contribute to environmental justice and can obviate social problems that are indirectly brought on by the environment.

• Partnership for the Goals, SDG 17: According to the report, achieving goals linked to debt restructuring for developing nations, more equitable free trade systems and agreements, improved macroeconomic stability, improved global sustainability policy, and developing nations' access to technical support can all help CE practises.

4- SDGs with no link with CE practices-

• Good Health and Well-Being: SDG 3 Although not clearly supported in the recognised literature, the analysis acknowledges a potential indirect benefit of CE to health, well-being, and lower child mortality through, for example, reduced pollution and improved water treatment. In contrast hand, there could be a cost associated with CE procedures like recycling human waste. A weak or non-existent direct correlation was found for the majority of SDG 3 targets.

• SDG 5 - Gender Equality: Weak or no connections were found between the goals of eradicating violence, discrimination, and harmful behaviours against women and girls, as well as the goals of enhancing their empowerment. Nevertheless, accomplishing goals regarding equal rights for women to possess and influence over land and other natural resources as well as involvement in leadership roles has the potential to encourage CE practises and related entrepreneurship.

• SDG10 - Despite the influence of "reducing inequality" on enabling CE, as previously indicated, there is a lesser link with other aims, such as those

involving eliminating discrimination and guaranteeing equality in policies and laws supervision of financial markets.

• Sustainable Cities and Communities SDG 11: As already mentioned, there is a direct connection between CE and several of the goals listed under this one. The study discovered a decreased correlation between CE and factors like enabling access to green spaces and public areas, as well as lowering disaster-related deaths and damages.

• Peace, Justice, and Strong Institutions (SDG 16): Finding a weak link between CE. practises and achieving goals on, for example, people smuggling, equitable access to justice, illicit trafficking, and organised crime, as well as providing legal identification for everyone and strengthening national organisations that address these issues, may not come as a surprise.

5-SDG cooperation promoting CE practices-

Nearly all of the SDGs feature targets that can support collaborations and cooperation that could support the promotion of CE practises, especially SDG 17 - Partnerships for the Goals.

Conclusion-

The research presented in this paper suggests that CE practises can assist in achieving a number of SDG targets. They help to achieve 21 of the aims directly and help to achieve another 28 targets indirectly. The aims of SDGs 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 15 have the strongest relationships with CE practises (Life on Land). Additionally, CE practises have the potential to foster synergies across various SDGs, such as SDGs 1 and 2 (which aim to end hunger and promote sustainable food production), 8 (which promotes economic growth and jobs), and 14 (which aims to safeguard biodiversity on land and in the oceans) (SDG 15). The SDGs can aid in both the development of CE practises as well as the achievement of various SDG targets. The adoption of CE practises will benefit from progress on many of the key SDGs goals, even those that are not specifically linked to CE. SDG 16 (Peace, Justice, and Strong Institutions), SDG 4 (Quality Education), which represents the "software" components of democratic accountability and skills, and SDG 9 (Industry, Innovation, and Infrastructure), which represents the "hardware" components of infrastructure and facilities for a circular economic system, are of particular importance.

Limitations of the study-

Given the limits of this analysis, the conclusion is drawn and additional in-depth research to produce more empirical proof of the relationship amongst CE and the Goals, to expand and strengthen this exploratory evaluation is recommended.

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