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A Study on Circular Economy and its Influence on Economic Development

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ABSTRACT

The circular economy is clearly beneficial to sustainability efforts, but it also offers economic benefits to organizations. Moreover, consumers are increasingly demanding more sustainable practices from the brands with which they interact and expect to see positive outcomes for the planet through their purchases. The innovation to enable circularity will drive new opportunities for growth, greater resource security and sustainability and a more competitive economy. However, the circular economy model could provide a strong framework for development and a basis for setting principles to guide business innovation, policy, and education. Therefore, the paper largely focuses on the circular economy and its growth on economic development and the methodology of the study is purely based on the secondary data.

KEYWORDS: *Circular Economy, Sustainable practices, Innovation, Competitive economy.*

INTRODUCTION

Circular economy is a model inspired by nature that advocates a more frugal and optimized consumption of resources, and a limited generation of waste. It is a model of production and consumption, which involves sharing, leasing, reusing, repairing, remanufacturing, and recycling existing materials and products as long as possible, in order to extend the life cycle of products.
The circular economy is based on three principles, driven by design:

- eliminating waste and pollution,
- keeping products and materials in use,
- and regenerating natural systems to decouple economic growth from the consumption of finite resources.

A circular economy suggests, at the macroeconomic level, severing the link between economic growth and the consumption of natural resources and inputs. In an ideal world, resource extraction rates would be lower than resource consumption rates, and trash generation rates would be lower than the capacity of the environment to absorb and process waste. A circular economy can also be thought of as a regenerative system, where long-term design, maintenance, repair, reuse, sharing, remanufacturing, refurbishing, and recycling operations minimize resource input and waste, emissions, and energy leakages.
For the circular economy, sustainable procurement translates firstly into an approach of reducing the consumption of natural resources and materials, and then into reducing the environmental impacts of the materials used, focusing on renewable, bio-based materials, secondary (recycled content) raw materials and in all cases materials from certified and traceable sources.

The circular economy is a holistic approach, integrated into all stages of a value chain, from:

- The supply side of the economy: sustainable resource procurement, eco-design of goods and processes, development of industrial and territorial ecology and implementation of the functional economy (switching to the use of a service rather than the possession of a good);
- The consumer demand and behaviour: responsible purchasing behaviour, good product use, and product's duration of use extension.

• The management of waste that could not be avoided, which should favour recycling and, where necessary and possible, energy recovery, thus closing the loop.

SIGNIFICANCE OF THE STUDY

Building on past ideas about the limited nature of resources, the circular economy emphasizes the need for a paradigm change in which civilizations must abandon unidirectional "take-make-discard" processes of production and consumption. The circular economy addresses the complete cycle, encompassing design, production, usage, and the waste phase, rather than just the final link in the chain, which is recycling and recovery of garbage. The creation of innovative business strategies and more intelligent, energy-efficient goods that are long-lasting, require less maintenance, and are simple to repair or refurbish are all part of the eco-design movement. It also has to do with cutting back on wasteful spending.

OBJECTIVES OF THE STUDY

The study was conducted taking into consideration the following objectives:
To focus on the study of circular economy and its growth on economic development.
To examine the key indicators of circular economy for the development of the country.

METHODOLOGY OF THE STUDY

The research study is purely based on the secondary sources of data are used for analyzing and interpreting the data and results.
Reducing waste (i.e., goods with negative value) is the cornerstone of the circular economy. This waste can be material, such as construction materials, metals, and plastics; organic, such as agricultural residues; or informational, such as incomplete or absent information that causes a mismatch in supply and demand. The latter speaks of the chances lost because there was a lack of information, awareness, or resources available to society to utilize idle capacities, such as unoccupied car seats, vacant rooms, or underutilized equipment (that might be needed by another business). This led to wasteful production, increased expenses, and negative environmental effects because there was insufficient knowledge about these capacities.

In the medium run, the circular economy concept's adoption is probably going to have significant macro repercussions. When it is gradually implemented, there will be structural changes in investment, employment, capital depreciation, and sectoral growth as the focus moves to managing end-of-life resources, designing for durability, and the growing role of services in the economy. Because material loops may be more readily handled on a national and regional level, the circular economy is also expected to result in closer production and consuming locations. As with many manufacturing sectors and industrial locations, inputs are primarily imported. A circular economy can help reduce imports of inputs and move supply chains closer to their regional hubs.

GOVERNANCE AND POLICY

• Waste management policies with priority toward efficient use of resources, waste prevention and minimization, safe disposal of toxic waste and minimized pollutants. Implemented waste policy and strategies need to be in line with SDGs.
• Supporting frameworks for waste reduction, and using waste as resources, including targets for
collection, recovery and recycling operations
• Mechanisms for review and reform. An important aspect of the policy is to ensure that the weight and balance of policy across the different dimensions are appropriate. Overinvestment in final disposal, for example, may reduce the incentive to reduce waste generation and discourage reuse, recovery, and recycling (depending on other elements of policy, e.g. prices).
• Legislation and subsidiary regulations (including legislation in compliance with relevant obligations under international law), along with implementation, compliance, and enforcement
actions to ensure their effectiveness
• Clear delineation of responsibilities and mandates among actors (e.g. national and local authorities, producers, importers) and adequate allocation of resources, authority, and power to fulfil these responsibilities (including sub-national or regional cooperation mechanisms).

WASTE TREATMENT INFRASTRUCTURE

• Sufficient waste treatment infrastructure is needed that require adequate investments in the facilities for waste collection, sorting, treatment, recovery and disposal of non-recoverable fractions, which is a barrier for ongoing improvement of resource efficiency in the countries
• Sharing technologies and best practices, and where appropriate, regional cooperation Extended Producer Responsibility
• Introduction of Extended Producer Responsibility (EPR), recognised as an internationally applied policy principle helping to reduce waste generation and promote re-use and recycling operations, is making producers of the product responsible for the entire live cycle of the product, including
the end - of - use stage.

Taxation system and economic instruments:

• System of economic instruments including taxes and financial incentives supporting the sector to be implemented as an effective policy tool in the prevention, minimisation and sound
management of waste.
• Fees and charges need to support costs recovery of waste management, polluter pays, and ensure the financial sustainability of waste management services.

Education and awareness:

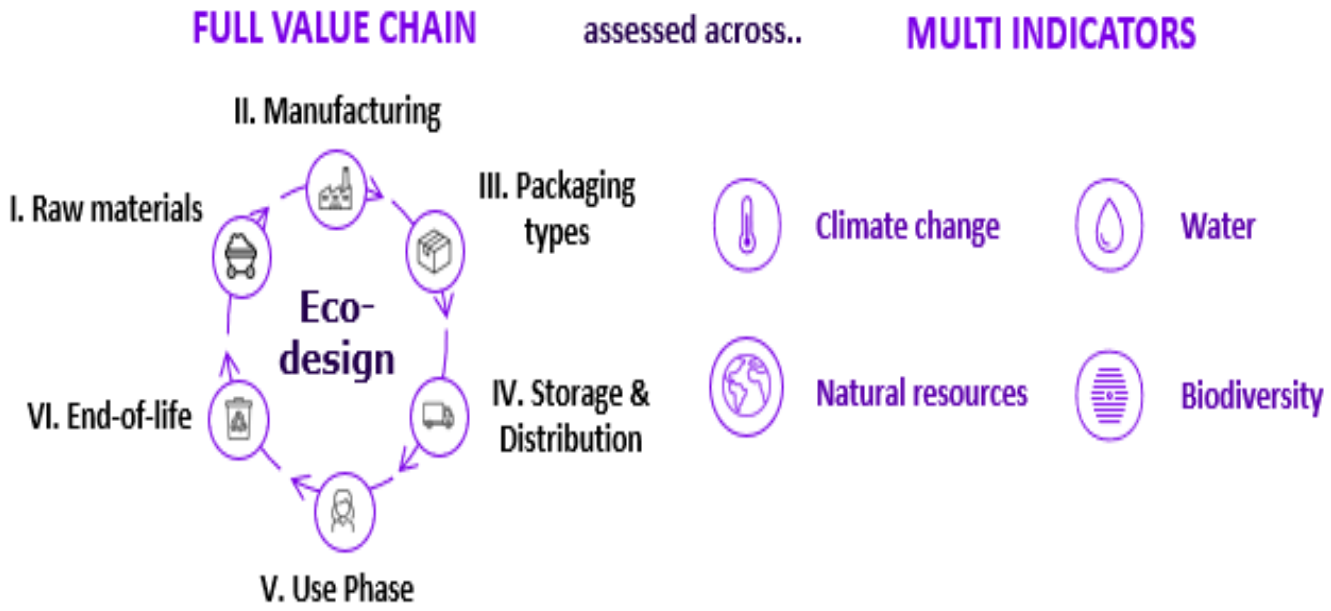
- Education and publicity programmes to change public attitudes and behaviour
- Programmes to train and maintain teams of skilled and committed waste management workers, not only in the waste management industry itself but also in public waste management services

and in those enterprises which are major generators of waste.

ECO-DESIGN PRODUCTS AND PROCESSES

The eco-design concept is a "rethink" approach that aims to improve our medicines' environmental performance by integrating environmental criteria into our product design and development. We have a holistic approach which considers:

- All steps of the life cycle (Raw material extraction & transformation, Manufacturing, Packaging, Distribution, patient use phase, End of life treatment);
- Multi-criteria indicators (Climate change, water scarcity, resource use, circularity …);
- To reduce the environmental impacts in a global perspective.



One of the main tenets of India's policy objectives has been green growth, as the budget plan for 2023–24 reflects. This is evident from the finance minister's budget address, which placed a strong emphasis on green growth. The emphasis on energy transition has been one of the most significant features of this green growth concept. The budgetary provisions set aside for this purpose demonstrate the government's commitment to achieving this. The budget allots Rs 35000 crores for energy transition, which is a big step toward realizing the objective of sustainable growth. Nonetheless, there are important matters that must be considered in order to comprehend the difficulties that lie ahead and how this budgetary allocation can be best utilized to address these challenges.

The extension of the circular economy concept is a crucial component of this energy revolution, as it will enable us not only meet our green goals but also reuse and recycle products for our own consumption. The foundation of an effective energy transition is a circular economy. This working paper aims to identify India's current position as a circular economy and to comprehend the obstacles that it faces. To do so, it is critical to clarify what the circular economy entails and what its constituent parts are.

Without a doubt, the increasing global trend in waste poses a challenge to the sustainability of the eco-economic system. The waste management process needs interdisciplinary research and cooperation, as well as revolutionary reforms and enhancements, in order to achieve the preventative approach. This challenge affects a wide range of stakeholders, including the government, local and regional government bodies, the general public, academic communities, and corporate groups. It calls for behavioral changes, a reinterpretation of current waste management practices, and a shift toward the increasingly popular circular economy (CE) principles.

Basic principles of "3R" circular economy: 1. Reduce 2. Reuse 3. Recycle The state government bodies will face the need to refer to principles of circular economy for achievement of required extent of eco-economical sustainability and competitive power at global level more often.

The tremendous amount of waste produced is one of the most visible effects of the linear economy. Many products are still single-use. More people have started becoming aware of the damaging side effects of a linear economy. Depleting resources and international tensions make many people realize how dependent they are on goods from far away markets. This awareness has helped the circular economy rapidly gain ground. Sound waste management, which includes the 3-R strategy "REDUCE, REUSE, RECYCLE", can be a precursor and catalyst to a circular economy. By tackling waste management, countries can improve health, hygiene, the environment and bring resources back into the economy.

THE KEY PRINCIPLES OF THIS APPROACH ARE

- (i) Cradle to Cradle design takes inspiration from natural systems, where there is no concept of waste: everything is a resource for something else. Biological nutrients should be safely returned to the soil, while technical nutrients should be used again and again at high quality.
- (ii) The second principle is to use clean and renewable energy. The argument goes that natural systems thrive on current solar income and human systems could too. Renewable energy is clean (at the point of use), low-cost to operate, creates no emissions in use, and utilizes abundant resources.
- (iii) Finally, celebrate diversity: diversity builds resilience in natural systems, and can do so in human systems, too. Equally, no two places are the same: a diverse approach is often necessary to overcome the challenges and meet the opportunities offered by different geographies.

EFFECTS OF CLIMATE CHANGE

India is highly vulnerable to the impacts of climate change. We are already experiencing the adverse effects of climate change, such as more frequent and severe droughts, floods, heat waves, and extreme weather events. More frequent and severe heat waves have led to increased mortality and morbidity.

Over 2,000 people died in India during a heatwave in 2015. Certain parts of India are experiencing increasingly frequent and severe droughts as a result of altered rainfall patterns brought about by climate change. Water shortage as a result has an impact on both human and animal populations. Keralans experienced one of the worst floods since the historic floods of 1924 in August of 2018. 96% more rain fell in the state than was expected, causing severe flooding in most areas. The state's natural flora and wildlife, as well as industries related to agriculture, housing, fishing, animal husbandry, and other sectors, suffered severe losses. About 330 landslides were recorded by the State Land Revenue Department, with an estimated INR 31,000 crore in economic losses.

The sector most susceptible to climate change is agriculture, which generates 43% of employment in India and 15% of the country's GDP. Extreme rains, frequent heat waves, a lack of water, and degraded soil all have a direct effect on India's agricultural output and earnings. Reduced output thus leads to a decline in rural income and a reduction in demand. Additionally, heatwaves lower worker productivity. Production of cereals is especially sensitive. According to IPCC estimates, a 1-4 degree increase in temperature in the 21st century will result in a 10–30% reduction in rice productivity and a 25–70% loss in maize production in India.

India has a long coastline of around 7517 kms and rising sea levels due to climate change pose a significant threat to coastal communities. Cyclones and storm surges can cause widespread damage to infrastructure and homes.

INDIA'S TRANSITION TO A CIRCULAR ECONOMY

The Indian economy and middle-class risk missing out on a regenerative development route that leads to long-term prosperity if they keep expanding under the existing linear supply-chain model. On the other hand, the circular economy model might offer a solid foundation for growth and a basis for establishing values that direct corporate innovation, public policy, and educational initiatives. By employing the current building blocks to embark on a circular development path and reap its benefits, applying these principles will help India expand its current circular economy practices and scale them across industries and value chains.

The concepts of the circular economy can help create a system that would satisfy the expanding demands of the Indian populace, particularly in urban areas. It might aid in reducing harmful externalities including pollution, traffic, and greenhouse gas emissions. This shift is centered around three essential components.

REDUCING NEGATIVE EXTERNALITIES

Indian cities see significant noise pollution. Major Indian cities like Mumbai, Hyderabad and Delhi exceed the government noise limits. The major contributors to the noise pollution are industry, transport, and construction. High noise pollution levels have been linked with various health issues like cardiovascular diseases.

India is vulnerable to air pollution. It has a negative impact on the residents' health. Cardiovascular and respiratory disorders are brought on by air pollution. The World Health Organization (WHO) estimates that outdoor air pollution killed 620,000 people in India in 2012—more than any other country in the world, second only to China. Vehicle emissions, industrial processes, and the burning of biomass are the main causes of air pollution. Pollution levels in the air have been determined to be much higher than most big cities' air quality limits. India's per capita carbon emissions are projected to climb over the next 20 years, although they are still expected to be substantially lower than the global average49.

However, if we look at the CO2 emissions in absolute terms, it has tripled between 1990 and 2014 in India. This is the third highest in the world. India has committed to reduce the Greenhouse emission intensity of its GDP by between 33 and 35% by 2030 (considering 2005 as base year).

Economic activities are associated with negative externalities like land degradation, air, water, and noise pollution, the release of toxic substances, and greenhouse gas emissions. They not only disturb the ecological balance by disrupting the natural cycles, it impacts the flora and fauna including humans.

Adopting a circular economy development route has the potential to greatly reduce adverse environmental externalities. For instance, compared to the current development scenario, greenhouse gas (GHG) emissions may be 23% and 44% lower in 2030 and 2050, respectively, assisting India in meeting its commitments under the recently signed Paris Agreement. The cumulative emissions in the three target areas are used to create this comparison. Other negative externalities, such as those coming from the linear use of raw materials and water, and the consumption of synthetic fertilizers, would also diminish.

STEPS TAKEN TOWARDS CREATING A CIRCULAR ECONOMY

The circular economy is being promoted by India through a multifaceted policy framework that combines financial incentives, awareness campaigns, regulatory measures, and capacity training. This section examines some of the major programs and policies that the Indian government has put in place to support the circular economy.

(i) National Resource Efficiency Policy (NREP):

One of the most important policies to achieve the goal of a circular economy is the National **Resource Efficiency Policy (NREP).** The NREP was launched in 2019 with the objective of promoting sustainable production and consumption patterns, enhancing resource efficiency, and reducing the environmental impact of economic activities.

The policy includes measures to encourage the adoption of circular business models, such as product-as-a-service, leasing, and sharing, and promotes the use of recycled materials. In addition to the NREP, the framework of **Extended Producer Responsibility (EPR)** is another element of the policies designed to facilitate the creation of a circular economy. EPR is a regulatory framework that makes manufacturers and producers responsible for the post-consumer waste generated by their products. The EPR framework encourages producers to adopt sustainable product design practices, increase the use of recycled materials, and support waste management and recycling initiatives.

(ii) Swachh Bharat Mission (SBM)

This is another critical policy intervention when it comes to aspects of waste segregation and recycling. The Swachh Bharat Mission was launched in 2014 with the objective of promoting cleanliness, hygiene, and waste management. The mission includes initiatives to promote waste segregation, recycling, and composting, and aims to make India a "zero-waste" country. A reduction in waste generation is central to the goal of a circular economy.

(iii) Atal Innovation Mission

Another policy intervention which stands out in terms of its rationale for a circular economy is the Atal Innovation Mission. The Atal Innovation Mission was launched in 2016 to promote innovation and entrepreneurship in India. The mission includes initiatives to support the development of circular business models and encourage the adoption of sustainable technologies.

(iv) Financial Incentives

In addition to these policy initiatives, a number of interventions have been made which revolve around financial incentives for the efficient utilization of resources. In line with these, the Indian government has implemented various financial incentives to encourage the adoption of circular business models and promote sustainable consumption patterns. These incentives include tax benefits, subsidies, and low-interest loans to the recycling industry.

FUTURE SCENARIO

This science-based expertise allows us to evaluate potential environmental impacts and take action to supply eco-innovative products.

That is why Sanofi is committed to deliver the following:

1. By 2025, 100% of our new products will be eco-designed
2. By 2027, 100% of our vaccines packaging will be blister-free
3. By 2030, 100% of our top-20-selling products will be eco-designed

Fully integrated in our “Planet Care” roadmap, Eco-design is one of our Corporate Social Responsibility flagships.

The absence of suitable infrastructure for recycling and garbage management is one of the main problems. To facilitate the efficient and effective processing of garbage, India must make investments in waste processing and recycling facilities as well as enhance waste collection and segregation systems. The ignorance of businesses and customers regarding the principles of the circular economy is another problem. In order to stimulate the adoption of circular economy practices and persuade people to adopt sustainable consumption habits, the government must launch awareness campaigns and education initiatives.

India's policy framework to promote the circular economy also includes a range of measures to encourage the adoption of circular business models, promote resource efficiency, and reduce waste generation. These policies and initiatives are critical to achieving India's sustainable development goals and ensuring a more sustainable and prosperous future for the country. However, India still faces several challenges in transitioning towards a circular economy.

A circular economy may also help India in its fight against climate change. The circular economy is in line with India's obligations to the Paris Agreement since it encourages the use of renewable energy sources, lowers greenhouse gas emissions, and minimizes waste generation. The circular economy's emphasis on resource optimization and energy efficiency may also help India become less dependent on imported resources and the resulting transportation-related greenhouse gas emissions.

CONCLUSION

Applying the circular economy's (CE) methods and ideas is increasingly seen as a crucial component in achieving sustainable development objectives. This is because, in the context of the circular economy, economic activity aims to minimize the quantity of waste produced and emissions that are harmful while simultaneously maximizing the conservation of the value of goods, materials, and resources. It is evident that the increasing global trend in waste poses a risk to the sustainability of the eco-economic system. The waste management process needs to be transformed and improved by breakthrough research, interdisciplinary collaborations, and groundbreaking innovations in order to attain the most favored waste avoidance plan.

As of right now, figuring out how to reuse, recycle, and reduce trash in a way that is both environmentally safe and economically viable is a crucial objective, wherein environmental assessment of waste components and assessment of their long-term impact on the environment remain a high priority objective.

In conclusion, India stands to gain a great deal from the shift to a circular economy, including increased economic growth and the creation of jobs as well as environmental preservation. India's pledges to sustainable development and climate change mitigation are in line with the circular economy's emphasis on lowering greenhouse gas emissions, encouraging local production and resource optimization, and minimizing waste output. Thus, India needs to move quickly to hasten the shift to a circular economy. Some of these proactive measures include making infrastructural investments, promoting technological advancement and innovation, and raising public knowledge of and support for the circular economy.

Finally, India's resource security and resilience could be enhanced via a circular economy. India is primarily dependent on imported minerals, coal, and oil. India's resource security and resilience may be enhanced by the circular economy's focus on localizing production and using locally obtained commodities, which would lessen its susceptibility to changes in global prices and supply chain disruptions.

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