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## Circular Economy and Environmental Protection

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### Abstract:

*Circular economy (CE) is a model of production and consumption that involves leasing, sharing, reusing, repairing, refurbishing and recycling. It deals with the global issues like climate change, biodiversity loss, waste and pollution. It is basically related to waste management. Circular economy and sustainability are closely related to each other. While the aim of sustainability to manage productive resources, on the other hand CE is try to make our production process more efficient. Majority of our natural resources are finite therefore the role of CE is critical in the context of Indian economy. This article paper aims to ascertain the current situation of circular economy in India and also discussed about its future prospects in country. This paper also articulated how this would help India to protect its natural resources. The Paper also discussed many positive impacts of circular economy to environment that helps to reduce the effect of negative environmental effects. This study will contribute to future*

*decisions and actions taken by government. The study based on secondary data that includes various types of journals, articles and websites that include domestic as well as foreign sources. It will help in better formulation of policies regarding circular economy and protection of environment.*

**Keywords:** *circular economy, waste management, environmental protection, linear economy, recycling.*

### **Introduction:**

The world's population had reached 8 billion and it is expected to reach 9 billion in 2037 and 10 Arab in 2058. Most of the population is situated in Asia and Africa. That will increase the demand for food and energy and other natural resources and to fulfill the required demand a lot of production activities will take place and consequently a lot of waste would be created. That's why the sustainable management of resources will be crucial to face these challenges. Therefore there is an urgent need to make a balance between economic growth and economic protection. Economics and Environment cannot be separated they are closely interrelated. If there is any economic activity then it must have environmental consequences in the form of waste generation. To tackle these types of problems many initiatives and methods have been developed by economists and global institutions and the circular economy is one of them. The concept of Circular economy depends on three principles that are reducing, reusing, and recycling. It develops a strong linkage between Environment and Economics. Since ancient times, the Indian civilization has focused on the preservation of resources. This has been an essential part of the Indian and is reflected in our religious practices, folklore, art, and culture pervading every aspect of the daily lives of people. The principles of sustainable development and climate consciousness had been followed by our ancestors and they were treating 'waste as wealth', where commodities are being reused and recycled through a circular economy approach. Changes do not

occur very fast, but with time, new behaviors and conscious efforts about recycling have become increasing day by day. At the time, developed countries are attempting the transition from linear to circular economies. India too are making efforts towards transition from a linear economy to circular economy. According to renowned foundation analysis, the Adoption of a circular economy in India will result in yearly benefits of \$624 billion by 2050 and 445 reductions in greenhouse gas emissions Hence, the circular economy plays a pivotal role in conserving the environmental condition and

Creating a reward system to encourage recycling of wastes. And furthermore, it can help India towards Atmanirbhar Bharat and the key to an Atmanirbhar Bharat is sustainable growth. The need of the hour is a development model that leads to the optimum utilization of resources. With increasing population, climate change, rapid urbanization, and environmental pollution, India need a circular economy model.

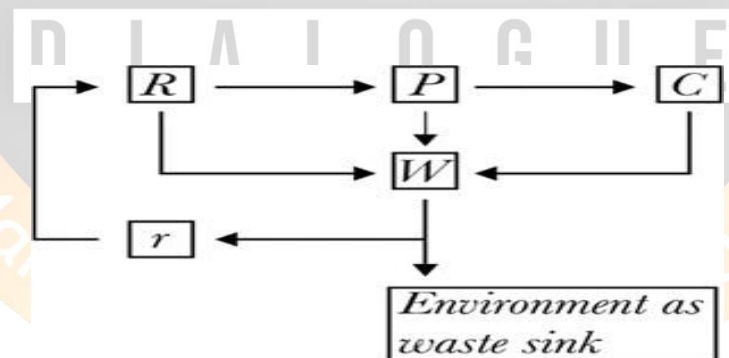
#### **Historical background:**

The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. The idea of circular flow for materials and energy is not new, appearing as early as 1966 in the book by Kenneth E. Boulding, who explains that we should be in a "cyclical" system of production. The term "circular economy" appeared for the first time in 1988 in "The Economics of Natural Resources"(Wikipedia). And soon after that was used by Pearce and Turner. And after this it is used by Pearce and turner. They said that ignoring the environment means that we are ignoring the Economy.

In his paper Boulding while explaining the circular economy, made a famous distinction between Cowboy and spaceship economies. Prior to Boulding it was assumed that Earth was without limit and they could exploit natural resources infinitely and. there is no problem of disposal of waste. According to him human is exploitative and destructive, after using one area they would move to another area to exploit. They don't care about natural resource depletion and pollution. Therefore

more and more consumption and production activities will take place. Cowboy economy assumes that Earth can dispose any amount of waste but Boulding criticize it and states that natural resources are finite and earth is a closed system unlike cowboy economy where earth treated as open system. Boulding called it spaceship economy where whatever the waste would be created will retain on the earth. In this economy all natural resources have to be recycled. This concept is based on minimization not on maximization i.e. Minimization of production, consumption and therefore minimization of waste. After nearly twenty year the concept of spaceship economy became the heart of the sustainable development in the Brundtland report.

Till 1990 the concept of circular economy was not clearly defined in economic terms it was Pearce and turner who defined it in 1990. In fact Kelly turner should be credited to invention of the term “Circular economy”. Pearce and turner simple model of circular economy consider recycling as the dominant process in circularity. Pearce and turner also talked first time about exhaustible and non-renewable resources. Circular economy model of these two gave us complete picture of circularity.



Note: key: R= resources, P= production, C= consumption, w= waste, r= recycling

Source: Pearce and Turner 1990: 38

Linear economy and circular economy:

Traditional industrial manufacturing methods have led to unsustainable levels of production as well as consumption. This system driven by a high rate of natural

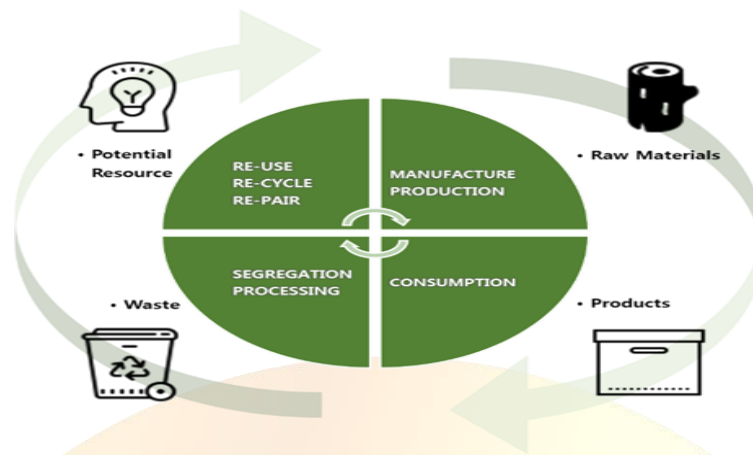
resource extraction, processing, distribution, use, and disposal – is known as a linear economy. A linear economy based on over-exploitation of natural resources, unsustainable production, and environmental degradation. These results, especially environmental damages, indicate that the linear economy is not a sustainable way for economic activities. This business-as-usual approach will stall production processes and lead to continued resource depletion, polluting the soil, air, and oceans and, that will destroy our essential ecosystem functions.



**Figure 1:** Current Linear Economy

A Circular Economy is a type of Economy that focuses on 3R principles i.e. Reducing, Reusing, and Recycling. The Circular Economy is also known as the “Closed-Loop Economy”, which means that it closes the loop by using the least number of raw materials and also by reusing and recycling the existing products and materials as many times as possible. This Circular Economy helps in creating a better Eco-friendly and Environment Sustainable Economy for any country. When the materials reach their End-of-life period they are recycled and can be reused for a longer period.

The transition from a linear economy to a circular economy demands a collective effort from all sectors and stakeholders: businesses, governments, and the general public, within a wide range of fields such as agriculture, industry, and energy production. Policy stakeholders at different levels have introduced circular economies with varying degrees of success.



**Figure 2: Circular Economy**

### **Circular economy in municipality waste in India:**

In India Municipal solid & liquid waste can be divided into five sub-categories namely dry waste, wet waste, construction and demolition waste, wastewater, and treated sludge. In India, an estimated 55 million tonnes of Municipal Solid Waste has generated annually by 377 million citizens residing in urban areas. India's urban population is expected to grow to 600 million by 2030 & to 814 million by 2050. Accordingly, India is set to generate 165 million tonnes of waste by 2030 and 436 million tonnes by 2050. As a result, the annual greenhouse gas emissions from Municipal Solid Waste are expected to go up to 41.09 million tonnes by 2030. The need of the hour is therefore a development model based on the circular economy approach that looks at sustainable waste management and optimum utilization of resources - key to an AatmaNirbhar Bharat.

Municipal solid waste may be categorized into wet waste, dry waste, and construction and demolition waste. An analysis by Ministry of house and urban affairs identifies the significant potential for resource recovery from these waste categories through a circular economy. For example, dry waste recycling has the potential to generate approximately ₹11,836 crores per annum, and compost and Bio-CNG from wet waste can generate revenues of nearly ₹365 crores and ₹1,679 crores per annum respectively. Similarly, C&D waste has the potential to generate

revenues of approximately `416 crores per annum. A similar trend is seen in the liquid waste space with revenues amounting to `6,570 crores and `3,285 crores per annum for treated sludge and wastewater respectively.

### **Policy efforts for circular economy:**

The government is formulating many policies to promote circular economy in country. Niti Ayog too taking many steps towards sustainable growth. From moving from linear economy to circular economy, Nity Ayog have formed 11 committees for 11 focus areas. That will increase the process of circular economy in country. These are:

<b>S. No.</b>	<b>Focus Area</b>	<b>Concerned Line Ministry</b>
1.	Municipal Solid Waste and Liquid Waste	Ministry of Housing and Urban Affairs
2.	Scrap Metal (Ferrous and Non-Ferrous)	Ministry of steel
3.	Electronic Waste	Ministry of electronics and information technology
4.	Lithium ion Batteries	Niti Ayog
5.	Solar panels	MNRE
6.	Gypsum	Department for Promotion of Industry and Internal Trade
7.	Toxic and Hazardous Industrial Waste	Department of Chemicals and Petrochemicals
8.	Used Oil Waste	Ministry of Petroleum and Natural Gas
9.	Agriculture Waste	Ministry of Agriculture and Farmers' Welfare
10.	Tyre and Rubber Recycling	Department for Promotion of Industry and Internal Trade
11.	End-of-life Vehicles (ELVs)	Ministry of Road Transport and Highways

Besides this Niti Ayog also organizing many national and international conferences for the promotion of circular economy in the country. many step have been taken by government also regarding circular economy like plastics waste management rules(2016), e-Waste Management Rules, solid waste management rules (2016), Construction and Demolition Waste Management Rules(2016), Metals Recycling Policy, etc.

### **Other important policies:**

- National Resource Efficiency Policy (NREP), 2019
- Management Manual on Municipal Solid Waste (2016).
- Manual on Municipal Solid Waste Management (2000).
- TAG report on Municipal Solid Waste Management, (2005).
- National Environmental Policy, (2006).
- Environment (Protection) Act, 1986
- The Environment (Protection) Rules, 1986
- The Water (Prevention and control of pollution) Act, 1974.

**Conclusion:** The circular economy has got importance across the world in recent years and it is able to give us a proper solution to the present sustainable development challenges including waste management. A circular economy minimizes waste and pollution and gives a long life cycle to products and materials and all these are done by 3R i.e. reduce reuse and recycling approach. In 2014 waste processing in the country was 18 percent which has gone up to 68 percent in 2021. It shows that waste management in the country increased significantly since 2014 but still a lot of work that needs to do toward a circular economy. Preservation of finite natural resources is necessary not only for India but also for the world and in this regard role of the circular economy is significant. The implementation of swachh Bharat mission is also inspired by the 3R approach. The Circular economy approach strategy can accelerate the implementation of SDG goals



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