

Research Article

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Role of Sugar Industries in Development of Circular Economy (With Special Reference to Boramdeo Cooperative Sugar Industry, Ramhepur, Kawardha District of C.G. State)

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Keywords

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Optimum
Utilization.

Abstract

Sugar industries play a very crucial role for the development Indian economy. Not only it is concerned towards production of sugar through canes but it also uses the waste obtained during the production of sugar at its best. Thus, in this way it encourages the growth of circular economy by transforming the waste into productive thing. There are many by-products of the sugar that are obtained during the production of sugar. Each of the by-products obtained signifies the best use of waste from canes. These resultants obtained through the waste helps in shaping the financial structure of the industry and the country as well. So we can easily say that circular economy helps in the development of economy and sugar industry plays a vital role in development of circular economy.

Introduction

Sugar industry plays a vital role in boosting up the economy of the country. It not only focuses on the development by producing sugar but also by doing effective management of the waste obtained by the residues of the cane. This effective management of the waste that is mainly known as by-products of the sugar industry helps in encouragement of circular economy. With reference to the above fact Boramdeo Cooperative Sugar Industry which is located in

Ramhepur village of Kawardha district of Chhattisgarh state plays a key role in the enhancement of the circular economy. It has many by-products that help in raising circular economy. It is not only indulging in the activity of producing sugar, but has certain other products that have been made with the help of remains of sugarcane. These all by-products of the industry gives economic support to the factory, all together it results in the development of country's economy.

Circular Economy: Circular economy refers to the process in which emphasis on model of production and consumption is made in order to management of waste where materials are reused and recycled and all these activities are done by looking into the importance of sustainable development. This aims in reducing the waste and efficient use of resources in which the resources can come into use as long as possible. This helps in obtaining maximum value from the resources and using the material up to end of their service life.

Features of circular economy:

- **Waste management:** Circular economy helps in the management of waste by creating new products from the waste. By the creation of new product out of waste it helps in the development of economy in so many ways. Circular economy manages waste in anonymous ways.
- **Biodegradable material:** Here the materials are formed in such a way that is causes no harm to the environment. Here the wastes are converted in such a way that it could be taken back into the earth naturally.
- **Sustainability:** It helps in the sustainable development by reusing the waste and producing certain beneficial item out of it. By reusing the waste we can conserve the resources for our future generation. So circular economy plays a vital role in the development of sustainability. For an example with the use of baggasse the industry can produce electricity by its own.
- **Creation of new product:** Certain new products are created out of waste in the process of circular economy. By creating the new products through waste, it helps in giving the new value to the regenerated product. As a result of which it helps in boosting the economy of the country. So circular economy helps in the generation of new and unique design products.
- **Innovation:** Creation of new products out of waste helps in the development of innovative ideas that facilitate research and development. Raising innovative ideas helps in economic development of the country. So circular economy helps in the development of innovative ideas that encourages newness in the product line.

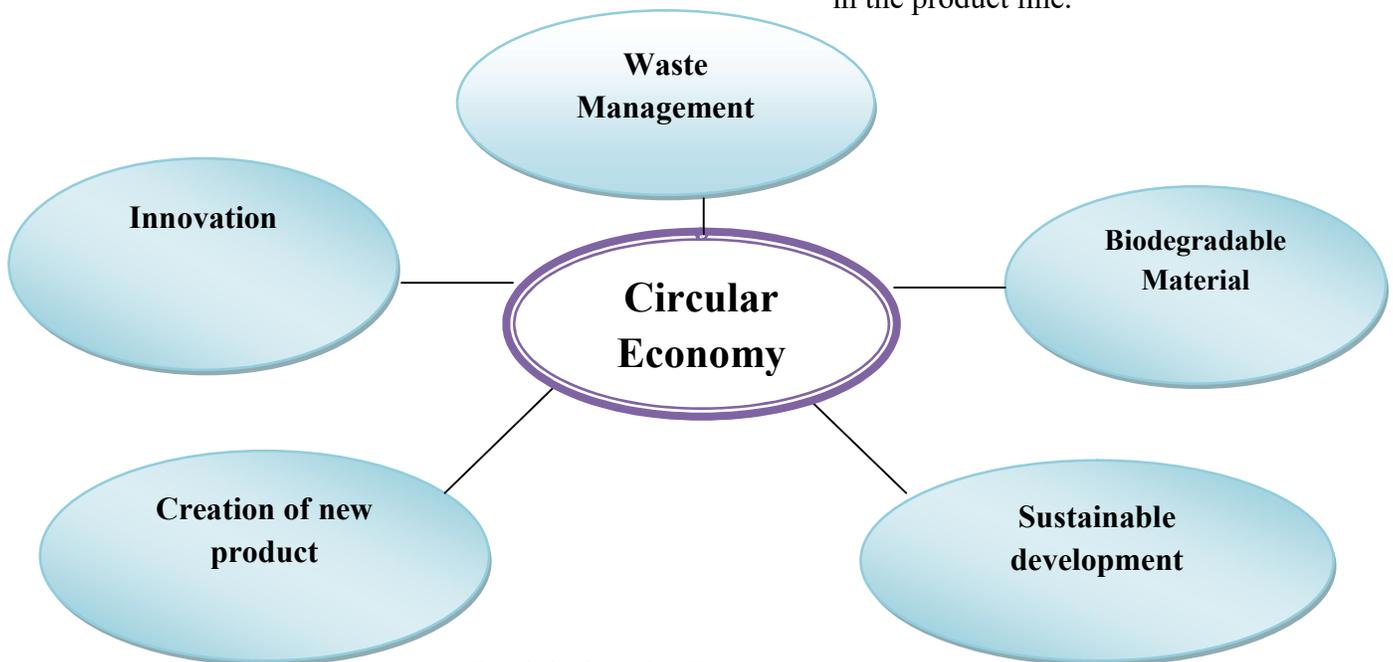


Fig 1.1. Circular Economy at a glance

Research Area

Ramhepur, Kawardha: Ramhepur is a small village located in Kabirdhsm district of Chhattisgarh state. As per the statistical record of 2009 Ramhepur village is also a gram panchayat. As per the census of 2011, the code of the village of is 439906. The geographical area of the village is 38,199 hectares, and the locality's pin code is 491559. The nearest town associated with the village is Pandariya . [Villageinfo]

Bhoramdeo Cooperative Sugar Industry, Ramhepur

Bhoramdeo Sahakari Shakkar Karkhana Maryadit, is being located at Ramhepur village in Kabirdham district of Chhattisgarh state. The site of the factory is being located near NH-30. The factory has well connectivity with the cities and towns nearby. The nearest railway station and airport is Raipur which is about 130 Km. from the village. The registration number of the factory is A.R./KWD/01; this registration has been done under Chhattisgarh State Societies Act on 03-04-2001. The sugar industry is cooperative. It began its first operation from season 2002-03 with the initial capacity of 2500 TCD. With time slowly and gradually the production of sugarcane and its area increased as a result of which the management of sugar factory decided to expand the capacity of crushing. The first expansion that was done by the factory was from 2500 TCD to 3500 TCD. In the year 2011-12 and 2012-13, 6MW power plant was installed in the factory premises by Chhattisgarh biomass based (Bagasse) Electricity board. It is the first sugar industry of the state for producing ethanol that is being used for the blending in petroleum. [Bssukm.com]

Some of the important by-product of Bhoramdeo sugar factory that helps in the development of circular economy.

- **Molasses** – Molasses is the byproduct of sugar formed from “C” grade sugar, during the centrifuging of sugar crystals. The yield

of Molasses Per ton of cane is in the range of 4 to 4.5% of the sugarcane's weight. Entire quantity of molasses produced is being used for captive consumption in one distillery. [The sugar association. (2020)]

- **Press mud-** It is the organic waste that is produced during the process of sugarcane juice filtration. It is rich in nitrogen, phosphorus and potash nutrients. It has several uses such as it is being used for conditioning the soil and it plays the role of organic fertilizer and pesticides. This encourages biodegradable production in the factory. [Vajiram Editor(2023)]
- **Bagasse:** It is one of the main byproduct of sugar. It is being produced when the sugarcane is crushed for its juice extraction to produce sugar. It is the fibrous waste. It helps a lot for energy generation making factory self reliable for energy need. It is used as bio fuel. This helps in bringing self sufficiency for energy resources facilitating sustainability. [BioPak]
- **Ethanol:** Ethanol is again one of the important byproduct that is being produced by the help of Molasses. Molasses is the main source of production of ethanol. It is 99.9% pure alcohol that can be used to blend with petrol that further leads to cleaner fuel alternative and it also helps in the reduction of prices of petrol. Bhoramdeo sugar industry is the first in state to produce ethanol.[Drishti IAS]

Objectives of the study

- To know about the efficient waste management of Bhoramdeo sugar industry.
- To know factory's contribution towards circular economy development.
- To know about factory's economical growth through circular economy.
- To know about factory's contribution towards sustainability.

Hypothesis

- Waste from canes is optimized efficiently in the factory.
- Innovative produces are done with the help of waste management practices.
- Circular economy practices help in shaping the factory's economical structure.
- Factory's waste management structure helps to achieve the goal of sustainability and biodegradable production.

Methodology

The survey method is used to collect the data from different employees of the Boramdeo Cooperative Sugar Industry, Village- Ramhepur. Structured questionnaires supported with personal interview are the main source of data. Discussions are also done with the participants those who were willing to give their views Therefore both the primary and secondary methods are used for data collection. About 50 different occupational respondents were selected randomly. And simple percentage method is used for the data analysis as the size of the sample being collected is small.

Result and Analysis of Concerned Topic

Table – 1 Age Wise Distribution

S. N.	Age Group	Number of Respondent
1.	0-25	05 (10%)
2.	25-35	12(24%)
3.	36-45	18 (36%)
4.	45 Above	15 (30%)

36% of the respondents were from the age group of 36-45, 30% of the respondents from 45 and above, 24% of the respondents from 25-35 and 10% from 0-25.

Table – 2 Evaluation of Opinion of Boramdeo Cooperative Sugar Industry

S. N.	Statement	Yes	No
1.	Does the waste from canes fully utilized in the factory?	27	23
2.	Does the waste management helps in economic stability of the factory?	40	10
3.	Does the factory facilitate biodegradable production in the factory?	33	17
4.	Does the factory helps in sustainable development?	32	18
6.	Does the factory facilitate innovative production encouraging circular economy?	31	19

By the above analysis we can easily figure out that waste from sugarcane are utilized maximum in the factory, proper waste management helps in bringing economic stability in the factory, factory facilitates in the biodegradable production,

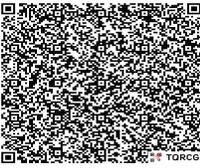
factory helps in facilitating sustainable development, factory fulfill their energy needs through proper waste management system and factory also facilitates in innovative production.

Conclusion

Thus by the above research we can easily figure out that Bhorandeo sugar industry plays vital role in development of circular economy as it efficiently manages its waste from the canes. It produces many by-products from the cane that help in shaping factory's economic structure as the by-products obtained are sold in the market, by producing press mud as a by-product it encourages biodegradable activity, use of bagasse in electricity production helps in sustainability, use of ethanol in blending petrol helps in shaping factory's economic structure and it also helps in cost reduction of petrol. As a whole it facilitates in innovative ideas of production.

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