

ANALYSIS OF SUSTAINABLE DEVELOPMENT IN AGRICULTURAL SECTOR THROUGH CIRCULAR
ECONOMY IN INDIA

PAPER
ON
SUSTAINABLE DEVELOPMENT

ON THE TOPIC

ANALYSIS OF SUSTAINABLE DEVELOPMENT IN
AGRICULTURAL SECTOR THROUGH CIRCULAR ECONOMY IN
INDIA

SUBMITTED BY
Pragnya Patnaik

UNDER THE GUIDANCE OF

1) Dr. H. K. Patnaik

- Director of EIC Sustainable Solutions Pvt. Ltd., India

2) Dr. Vijay Kumar Singh

- Dean, School of Law

University of Petroleum and Energy Studies, Dehradun, India

INDEX

Sr..No.	CONTENTS	Page No.
1.	Cover Page	1.
2.	Index	2.
3.	Abstract	3.
4.	Introduction and Background	4-6
5.	Sustainable Development and Circular Economy	7-13
6.	Circular Economy in Agricultural Sector, Challenges in Implementing Circular Economy in Agricultural Sector and Promoting SDGs through Circular Economy in Agricultural Sector in India	13-16
7.	Recommendations and Suggestions	16
8.	Conclusion	16-17
9.	Bibliography and References	17

ABSTRACT

Sustainable Development is an emerging and rapidly growing concept in today's era. There has been a lot of history in the evolution of this concept. According to the report "Our Common Future", published by Brundtland Commission, Sustainable Development was defined as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In other words, Sustainable Development is maintaining the economic progress and growth without compromising on the protection of the Environment. There needs to be an interdependence and integrity amongst the stability of the environment and the advancement of the economy. The three pillars of sustainable development are to be balanced for an effective outcome. These three pillars are: Environment, Economy and Social aspect. They, together are called "the Triple Bottom Line."

In recent times, the concept of Circular Economy is well connected with achieving Sustainability. The concept of Circular Economy entails an economic system whose purpose is to produce goods and services in such a manner that limits the consumption of resources and reduces the production of waste.

The two Models of Economy, that is, a) the Linear Economy, whose concept is to take→make→use→waste, and b) the Recycling Economy, which is take→make→use→recycle→make→use→waste, is different than the Circular Model. In Circular economy the flow is to reduce, reuse and recycle products in production, consumption, and distribution process. This not only eliminates the waste but also helps in utilising the resources to its fullest. In short, circular economy is optimum utilisation of resources without hampering the profits generated by the company and protecting the resources obtained from the environment.

Agricultural sector is known to be largest producing sector in the Indian economy. It is known to have the major population employed here and is a major contributor to the nation's GDP. Agriculture over the years has been resource intensive and this sector is known to produce most of the wastes. The ever increasing population and consumption within this population have forced agricultural activities to expand. However, in doing so the wastes produced have also increased with no feasible and effective way which leads to sustainability in this area. The paper focuses on why this concept should be used in the agricultural sector and how this concept can be implemented.

This paper deals with the following sections. The 1st section of this paper will deal with what is circular economy and how it is related to sustainability. The 2nd section will deal with circular economy in the agricultural sector and the current challenges being faced by the agricultural sector and if there is clarity in the concept of circular economy in the existing legislations. The final section will deal with how the Circular Economy promotes the Sustainable Development Goals in the agricultural sector with emphasis on Sustainable Development Goals number 2, 6 and 12.

Key Words: Sustainable Development, Sustainability, Circular Economy, SDG, Agriculture

I. **INTRODUCTION AND BACKGROUND**

A. INTRODUCTION

In the present times, the need to protect our environment has increased more than it ever was. We are well aware about the theory of the economies, that humans have unlimited wants and very limited resources to fulfill those needs. Keeping in mind the increasing population, advanced technological use, era of industrialization and urbanization, climatic changes, etc., the destruction of the environment has reached its peak. It is no news to us that the pace at which we exploit the resources available to us, we would not find an alternative for billions of years that can recover these resources and that in turn, can never be well for the human race.

Protection of the environment has been recognized and measures for the same have been taken in many countries. India, as well, has recognized and realized the importance of protecting the environment and in this regard, various legal measures have been taken in order to secure the environment along with improvising it. The Constitution of India has provided us with several provisions towards this cause. Apart from the Constitution of India, there have been a lot of laws which have been enacted with the aim to protect our scarce resources and our biodiversity. But even then, when we go through the surveys or the calamities we witness in our nation or even globally, we observe that the Statutes or the Bills passed by the Centre or the States have been unsuccessful to check the degradation caused to our environment and has also been the reason for ecological imbalances. The Indian Courts, too, have played an integral part towards creating an Environmental Jurisprudence in the hope that it creates and maintains a balance between environment security, eco- system balance and sustainable development. Despite the efforts, the core problem lies in the law-making body. The legislators do not have adequate and sufficient awareness about the causes, effects and impacts of environmental degradation and ecological imbalances, and the implementation techniques required to safeguarding the environment. Due to this very reason, the law makers are not able to formulate or draft a comprehensive, reliable and efficient legislation which can deal with the environmental problems. A law provision cannot make the environmental problems disappear but will rather, only add on to the pages to the book of laws. In order to avoid it, it is necessary that the enforcement of laws regarding environment has to be taken in an absolute manner.

B. BACKGROUND AND HISTORY

History has revealed that human activities have not only exploited the resources in the most severe manner but also have produced tons of wastes. These wastes were either in the form of solid, liquid or gas. The framework given by the regulatory institutions at national as well as the international level, have distinguished between the wastes based on the following parameters. The first involves the origin or the source of their production, that is, from where the wastes come, from mining sector, construction sector, agricultural sector, factories, etc. The second parameter is the degree of their hazardous nature. The last parameter involves the quality of the waste produced and the type of waste produced.

The Basel Convention of 1989¹, considered what waste was depending upon their end use. As provided under Article 2(1) of the Basel Convention of 1989, waste was defined as –

*“Wastes are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of the national law.”*²

Considering the Basel Convention, 1989 as their base, two other conventions as well adopted the same definition of the wastes. There were certain differences but the core remained the same. These were:

- a) The Bamako Convention, 1991³. Article I (1) of the Bamako Convention defined wastes and Article I (2) defined hazardous wastes.
- b) The Waigani Convention, 1995⁴. Article I of this Convention defined wastes. The slight difference between the Waigani Convention and the Basel Convention, 1989 was that, Waigani Convention mentioned about the Radioactive Wastes as well which was absent in the Basel Convention, 1989.

As one can interpret from the above given definition, it was an essential element that the waste has to be disposed of. In other words, only those substances or objects were considered

¹ The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)

² Article 2(1) of Basel Convention, 1989

³ The Bamako Convention on the Ban of the Import to Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa. This Convention came into force on April 22, 1998, but it was adopted on January 30, 1991.

⁴ The Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region. This Convention came into force on 21st October, 2001, but was adopted on 16th September, 1995.

to be wastes or in the category of this definition, which had reached their end life for use. Any other substance or object which could be used further, or had a probability to be used as something else, chances were, those substances or objects would not be regarded as wastes.

Another convention or law had described waste in a similar manner. The European Union Law of 1975⁵, in their treaty defined waste in Article 1(a). This Convention treated or referred waste as –

*“Waste is any substance or object which the holder disposes of or is required to dispose of pursuant to the rules of national law.”*⁶

After this, there came the OSPAR Convention(1992)⁷ which redefined the definition of waste. The main purpose of the OSPAR⁸ was to prevent and eliminate the pollution caused due to dumping or burning of waste. The Basel Convention and the European Union Law had based their definitions on the end use of waste. These conventions told us what waste is. But after OSPAR Convention, that perspective changed. OSPAR Convention stated what is not or cannot be considered as waste. Article 1(o) of the OSPAR Convention defined waste as –

“Wastes or other matter does not include the following:

- a) Human remains*
- b) Offshore installations*
- c) Offshore pipelines*
- d) Unprocessed fish and fish offal discarded from fishing vessel.”*

Following this, another Convention was introduced and gave another definition of waste. This was the London Protocol, 1972⁹ (amended in 2006). The 1996 Protocol, provided under Article 1(8) the definition of Waste. According to it –

“Wastes or other matters means any material or substance of any kind, form or description.”

⁵ Council Directive of 15th July, 1975 on “Waste” (75/442/EEC)

⁶ Article 1(a) of European Union Law, Council Directive (1975) (75/442/EEC)

⁷ The Convention for the Protection of the Marine Environment of North- East Atlantic, 1992

⁸ Named after Oslo and Paris Convention

⁹ The 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter, 1972. Also called the 1996 Protocol.

In the same year, 1972, an important and the most pivotal Convention known in the field of International Environmental Law, was introduced. This was the Stockholm Declaration, 1972 which was followed by the Rio Declaration, 1992. These two conventions have known to be the milestones of Environmental Law throughout the globe since the impact it created was quite significant. Two significant global conferences on the environment had resulted in the formation of these two Conventions. The basis of these two conventions were and it stated, that even when the Countries have sovereignty over their own natural resources, they cannot exploit it unnecessarily. It was their duty or their responsibility to use these resources judiciously and sustainably, without causing any harm to the environment.

The first international conference on environment was conducted at Stockholm. This conference was conducted in the year of 1972 and is also known as the United Nations Conference on the Human Environment, 1972¹⁰. Now this first conference in 1972 had mentioned about the depletion of our resources. It mentioned and stated that –

“The resources available on our earth must be used in such a way so as to safeguard the benefits derived from those resources for the present as well as the future generation. This can be achieved through careful planning and management, as is seemed fit by the States.”

This convention was the very first time when it was realized by the States that they have endangered the flora and the fauna of the earth and there is a need to put in efforts by the stakeholders in order to protect the environment. The protection of the environment needs to be viewed as the fundamental obligation for the State Governments and the industries. The resources were under- utilized by the developing states whereas, on the other hand, the developed states had exploited the resources or over- used them.

II. SUSTAINABLE DEVELOPMENT AND CIRCULAR ECONOMY

A. SUSTAINABLE DEVELOPMENT AND ITS HISTORY

¹⁰ Stockholm Declaration was adopted in the year 1992 on 16th June.

International Union for the Nature Conservation had published a report¹¹ on global environment in the 1950s. The report aimed to find a balance between our economic needs and development, while also considering our ecological system. The concept of Sustainable Development was first introduced in the year of 1970, by Barbara Mary Ward. The word “Sustainability” has derived its root from the Latin phrase, “*Sustinere*” whose literal translation is to “*hold*” or “*the ability to hold.*”

As mentioned above, the Stockholm Convention was the most significant convention for the betterment of the environment. It is said to be the Magna Carta of safeguarding the environment and also of Sustainable Development. The 19th century is known to be the era of industrialization and the stakeholders of all the countries were ignorant towards the use of natural resources and their activities in consuming them. This affected the environment and in order to make the people aware of their impulsive actions and its possible consequences, the United Nations Environment Program was made. The United Nations Environment Program (UNEP) was formed with the aim that a clear understanding of the environment can be given to all.

The second vital global conference on the environment was held in Rio de Janeiro. This conference was conducted in the year 1992 and is known to be the largest summit ever. The Rio Summit¹² had laid down the roadmap towards Sustainable Development. Sustainable Development is the concept where the needs and the wants of the present are fulfilled without compromising on the future needs of the generations to come.

In the Rio Summit, some crucial points were stated and implemented successfully:

- i) A declaration called the Rio Declaration of Environment and Development was mentioned. This declaration stated certain principles which emphasized upon the rights and liabilities, freedom and responsibilities regarding the Environmental safety, balance between the eco- systems and utilization of natural resources.
- ii) The human activities, so far were destructive to mankind and to our natural resources. This approach had to change in order to align itself with the sustainable development which was provided under Agenda 21.

¹¹ Deemed to be the first report towards environment protection

¹² United Nations Conference on Environment and Development (UNCED), 1992. Also called the Earth Summit.

- iii) There were also certain principles with the purpose of supporting the sustainable management of forests and biodiversity on a global level.
- iv) Ensuring the adoption of international conventions in the national law provisions such as, the Convention on Climate Change¹³ and the Convention on Biodiversity¹⁴, along with implementing and penalizing any environmental disruption in the form of degradation or damage caused to the environment. It also stated the provision to provide for compensation to those who are affected due to the pollution.¹⁵

Sustainable development has been based on the cooperation and the balance between the three dimensions, that is, the economic, social and environmental sections. These three dimensions together are called the Triple Bottom Line. It is essential to balance these three segments for harmony and order. If even one of the dimension gets disrupted, the other two will suffer. There has been a flexible list on the Sustainable development indicators. The States, in this matter, are free to choose to adopt the indicators as per their own policies and the needs of their country.

B. EVOLUTION OF ENVIRONMENTAL STATUTES IN INDIA

The Rio Declaration of Environment and Development has been significant in India. The Bhopal Gas Tragedy and the period after that (1984 onwards) has been crucial part of development and emergence of Environmental Jurisprudence in India. In the case of *R.L.E.K. Dehradun v. State of Uttar Pradesh*,¹⁶ the courts of India identified and accepted the concerns and the concepts mentioned in the Stockholm Convention held at Stockholm. Following this case, in another one of the cases, *Kanpur Tanneries Case*,¹⁷ the Apex Court quoted the declarations of Stockholm Conference, yet again, and gave importance and recognition to the fundamental right to environment. This was one of the cases where priority was given to environment over employment and revenue generated (which is the economic dimension of sustainability). In the case of *Law Society of India*,¹⁸ the principles which were

¹³ United Nations Framework Convention on Climate Change. This convention has been signed by 154 countries.

¹⁴ Convention on Biological Diversity. This convention has 196 parties and has been ratified by 30 countries.

¹⁵ Principle 13 of Rio Declaration of Environment and Development.

¹⁶ AIR 1985 SC 652. Also known as the Doon Valley Case.

¹⁷ AIR 1988 SC 1057. Also known as the *M.C. Mehta v. Union of India*. This is the most significant case in the history of environment developments in India.

¹⁸ *Law Society of India v. Fertilizer and Chemical Travancore Ltd.* AIR 1994 Ker. 308

established in Rio Declaration of Environment and Development in the year 1992, was expressly quoted.

In India, prior to the recognition of the International Conventions, the Government of India had started responding to the ever increasing environmental problems since the 1970s. But, the Conventions and to act upon those concerns initiated in the 1972. During the beginning of the 1970s, the environmental concerns raised were regarding the following sectors, like sewage disposal, sanitation and public health. These categories of concerns were divided amongst the various ministries under the Government of India. But still, there was improper coordination between the states, federal and the inter- governmental levels.

In the year 1970, Pitamber Pant was appointed to prepare reports on India's stand on environment protection and the policies and programmes aimed at it. The Pitamber Committee¹⁹ had emphasized in their report that there was a need to establish coordination and incorporation among the environmental policies and programmes as well as at the federal and the inter-governmental level.²⁰

Right after the Stockholm Conference which was held in 1972, the same year, India decided to set up a committee called the National Committee on Environmental Planning and Coordination. The National Committee on Environmental Planning and Coordination was supposed to act as an absolute advisory body for the Government of India. This committee was set up towards the aim of achieving the following purposes:

- a) Assessment of environment protection for the developmental projects
- b) Natural eco- systems protection surveys
- c) Planning on human settlement
- d) Spreading awareness about environment protection and sustainable development.

This committee, although, had a limitation. The National Committee on Environmental Planning and Coordination was only an advisory committee and therefore, the suggestions or their inputs were only treated as a guiding path and not as binding verdict. Due to this, another committee was set up which was the Tiwari Committee.

The Tiwari Committee made some vital changes to the pre-existing legislations. It strongly urged that there was a need to review and reform the Central and the State legislatures

¹⁹ Committee on the Human Environment. This committee was under the chairmanship of Pitamber Pant.

²⁰ Kailash Thakur, Environmental Protection law and Policies in India (2013)

regarding the Environment protection. Apart from that, it also suggested that there was a need to amend the law with the changing environmental outlook. It also introduced the idea of involving the environment protection laws in the Concurrent list. The Tiwari committee also recommended that a separate independent body or department of environment needs to be set up.

C. STATUTORY PROVISION ON ENVIRONMENT IN INDIA

The provisions and the statutes that provide for the protection and the advancement of the Environment in India include:

i) Constitution of India

The Indian Constitution, by the 42nd Amendment²¹, included Article 48- A and 51- A(g) have expressly provided for the provisions towards the protection and the improvement of the environment. Article 48A of the Constitution of India states that –

“Article 48A- The State shall endeavor to protect and improve the environment and safeguard the forests and wildlife of the country.”

Article 51 A(g) of the Indian Constitution states that –

“Article 51 A(g)- It shall be the duty of every Indian citizen to protect and improve the natural environment including forests, rivers, and wildlife and they must have compassion for living creatures.”

Despite these provisions, there has not been no mention of any mechanism through which this can be enforced. The state does have the power to enforce it, and yet this authority hasn't been exercised.

ii) The Environment (Protection) Act, 1986

This Act was formulated to deal with the aspects of environmental degradation and environmental protection. This Act has laid down various provisions towards safeguarding the environment from hazardous wastes. This Act also ensures the

²¹ In the year 1976

prevention of pollution and penalizing violations with regard to environmental protection.

- iii) The Air (Prevention and Control of Pollution) Act, 1981
- iv) The Water (Prevention and Control of Pollution) Act, 1974

D. CIRCULAR ECONOMY AND ITS HISTORY

Sustainable Development, since 1970, has evolved in itself. At first, the concept of Linear Economy was used. The process of Linear Economy was to procure the natural resources, make a product out of it, use that product or the resource and the rest is thrown in the wastes. In short, this economy had the process of take, make and waste. This was no way a path towards sustainable development.

There came another method. This was the Recycling Economy. The Recycling Economy was different than the Linear Economy since this mechanism recognized the need to recycle what can be recycled. But still, this economy wasn't that effective as it should have been. This was due to the fact that despite the resources being recycled, a lot of it was still going to be wasted and again, this wasn't fulfilling the aim of sustainable development.

This is where the concept of Circular Economy was introduced. According to the historical findings, around 6,000 BC the concept of Circular Economy was used near the island of Delma situated in the Gulf Basin. The findings have shown that the people of this island used the by-products they got after the cultivation of date palms. These agricultural by-products were used in the process of house construction. The leaves, the fiber, even the pollen was used in various other products. The biological waste was recycled and used in every possible way which a person could think of.

This is the concept of Circular Economy. In simpler terms, circular economy is the process wherein the life of the resources does not cease until and unless it has been used in every alternative way possible. By the time the resource comes out of the cycle, it has been used much more than its capacity and the waste produced is substantially reduced. The concept of Circular Economy, officially, was introduced in the year 1976. The traces of the same could be found on the report of European Commission. This mechanism was commenced by Robert Ayres. He also gave the theory of industrial metabolism, which is when this concept

was introduced. He called this as an ideal state for industries. He stated that the resources so used in the process must be rotated in the cycle in such a way that the usage of resources in the complete internal cycle leads to no waste. The unsustainable approach in the form of linear economy was eliminated by introduction of this method.

Germany was the first country to implement the concept of Circular Economy. The legislation of Germany, The Closed Substance Cycle Waste Management Act, 1994 was based on this economic approach. Following Germany, Japan also reviewed its waste management system and opted for such measures which would recycle the waste produced in an efficient, comprehensive and systematic manner. Japan made such reforms in the year 2000. After Germany and Japan, China was the country to adopt the Circular Economy practices. China accepted this concept in the year 1998. It started working towards the model, the design, the structure of Circular Economy and in 2002, the Central Government of China accepted and adopted this practice. According to sources, China is thought to be the first country to use the term “Circular Economy” with respect to the waste management and the policies regarding the resources.

The first ever definition of Circular Economy was as follows –

“Circular Economy means an economic system that aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles.”²²

The World Economic Forum had defined Circular Economy in the following manner:

“The concept of circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems, and business models.”

According to Ellen McArthur Foundation, the concept of Circular Economy was:

“Looking beyond the current take-make-dispose extractive industrial model, the concept of circular economy aims to redefine growth, focusing on positive society-

²² After Robert Ayres introduced the concept, this concept was researched upon and advanced by McDonough and Braungart. These two, along with Ayres, combined gave the first ever definition of Circular Economy.

wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles: design out waste and pollution; keep products and materials in use; regenerate natural systems. In other words, it is the economic system which is based on business models which redefines the end-of-product life concept with the utilization of the 3Rs known- Reduce, Reuse and Recycle. It creates environmental quality and friendly product, advances economic prosperity, social equity and in achieving the true spirit of sustainable development. ”

What we can deduce from all these definitions is that the core of Circular Economy is relied heavily upon the concept of Reduce, Reuse and Recycle. The concept of Circular Economy will entail the optimum utilization of the resources, designing the product in such a way which can be used for a long time, and also, which causes minimal pollution. The usual production and the consumption pattern, is designed differently under Circular Economy. Circular economy extends the product life-cycle and also reduces the use of natural resources to make that product.

In the present times, Europe has emerged above all regarding the policy developments adopting the concept of Circular Economy. The year 2014-15 marked the introduction and strategies to adopt circular economy in the legislations of the Europe effectively. After the European Union, we can also see, Finland, Netherlands, Scotland, and France have initiated their work towards Sustainable development achievement through Circular Economy. Currently, this concept has also been recognized in the African States.

There are a lot of benefits of Circular Economy. To mention a few, these are:

- a) A substantial reduction in the generation of pollution, harmful emissions, waste and resource use.
- b) A balance is met between the human race and eco- system which ensures the survival and maintenance of ecology.
- c) An increase in the competition in the global markets
- d) Helps to create employment.

Relating the benefits of Circular Economy in terms of the components of Sustainability, the benefits could be categorized in the following manner:

- a) Economic Benefit – The profits attained in this concept helps secure maximum optimization of resources and also increases the shareholders' wealth.
- b) Ecological Benefit – When there is reduction in the emission or production of pollutants, the environmental balance is restored. Also, reducing the use of natural resources ensures that there isn't any over- exploitation of the natural and scarce resources.
- c) Social Benefit – Under this heading, we can observe that the benefits reaped in form of reusing the natural resources, helps in achieving social prosperity.

The circular economy is based on the following principles and can also be characterized by the same:

- i) Reduce – The element of reduce is to reduce the utilization of scarce and non-renewable resources. Rather, emphasis is laid on utilization of renewable resources.
- ii) Reuse – This principle states that a product till its very best state, has to be used and after that instead of throwing it in the waste, it needs to be utilized in some alternative manner.
- iii) Recycle – The structure of circular economy is a closed loop or a closed circle which means that the product or the waste needs to be recycled and used again. The used product or the waste needs to be utilized as a secondary resource.
- iv) Re- manufacture – The concept of re- manufacture entails that the waste products must be utilized in such a manner so as to create a new product altogether.
- v) Repair – The products needs to be designed in such a manner so that the product lifetime is increased and the maintenance of the same can done with a cost-effective as well as low- maintenance service.

Circular economy, no longer is the method for good corporate governance or a step towards environmental protection. It also helps the three main stakeholders of circular economy, that is, the industries, government and the society. Circular economy is now viewed as a profitable way of doing business. The need of circular economy is to sustain and maintain the resources available and to reduce the waste production.

Like every other concept or principle, the concept of Circular Economy as well faces some drawbacks. These drawbacks include barriers in form of social acceptance and international market constraints. It is observed that the customer satisfaction or their lack of interest

towards this initiative is a hurdle. Despite the innovative strategies, the concept of Circular Economy has still not gained prominence throughout. This is mainly due to the lack of awareness amongst people regarding this concept. We may also notice that there has not been much government interference towards the planning or the implementation of this concept in the most effective method.

III. CIRCULAR ECONOMY IN THE AGRICULTURAL SECTOR AND THE CHALLENGES INVOLVED IN THE IMPLEMENTATION OF CIRCULAR ECONOMY IN INDIA

A. CIRCULAR ECONOMY IN AGRICULTURE SECTOR IN INDIA

The agricultural sector of India contributes around 16-17% to the National GDP of the country. It is also known to employ so much as two- third of the total population of India. By reviewing the statistics²³, we can see that India is known to be the second largest producer of agriculture around the globe. India is also accounted for around 7-8% of total agricultural products on the international level.

Circular Agriculture²⁴ is referred to as:

“Circular agriculture is an ecological concept that is based on the principle of optimising the use of all biomass. Circular agriculture is aimed at closing the loop of materials and substances, and reducing both resource use and discharges into the environment.”

There is known to be a lot of benefits by inculcating circular economy in the agricultural sector. The benefits are:

- a) There are fewer Green House Emissions.
- b) Healthy and Resilient Soil
- c) Fewer Negative Externalities in ways of chemical discharge
- d) Reduction in use of Fresh Water Resources
- e) Use of Bio fertilizer and Bio- energy

²³ Given by Ministry of Statistics and Program Implementation.

²⁴ Van Berkum et al. gave this definition in the year 2019.

We have already witnessed how circular economy is an effective tool towards achieving sustainability. Incorporation of this concept in every sector would be towards a greater and a good cause. But it is also a fact that the agricultural sector of India, still relies upon the linear economy. This not only costs a lot to the resources but also, the other resources involved, such as land, water, soil, etc., gets damaged as well.

B. CHALLENGES IN THE AGRICULTURAL SECTOR

The following challenges prevail in India which can be minimized by adopting circular economy in the sector. The challenges are:

- a) **Lack of Infrastructure:** India lacks the infrastructure which can efficiently process food. Since we lack the processing infrastructure, out of the total agricultural produce, 30- 40% of it is lost. This leaves us with an estimate of 4- 7% of the crops which are processed. Apart from that, availability of electricity is also not available, and lack of cold- storage systems leads to loss of more 10- 20% of the production in Indian agricultural sectors.
- b) **Water and Land Use:** It is estimated that out of the total fresh water available on the Earth, 4% of it is in India. In the agricultural production, 80% of this 4% fresh water, is used. There is poor water management in the field of agriculture. There is even the problem of improper land distribution, inefficient land records and restrictions on the tenancy which is faced by the farmers. The land used for agriculture and the income generated from it, is unaccounted for. Also, the land used for farming has been degraded throughout the years. The use of chemicals on the land as way of fertilizers, insecticides and pesticides have degraded the quality of land. The chemicals used, contaminates the land as well as the water.
- c) **Air Pollution:** The crop residues left after the agricultural production, most of it is burnt in the open field and this leads to air pollution.
- d) **Lengthy Supply Chain:** A lot of delays happens due to the fact that before the crops can reach the market, it has to undergo the hurdles of road transport, service toll tax,

inter- state checkpoints, etc. We can also observe the lack of market opportunities for effective handling facilities, grading of the crops and storage of those crops due to their perishable nature.

- e) Inadequate Farmer's Income: There are so many constraints on the connectivity of the markets to the agricultural lands that most of the time, the surplus cannot reach the markets. There is also a challenge to the farmer that there are a lot of agents or representatives present in the supply chain system. Thus, due to a lot of involvement of the people, by the time the profits that reach to the farmers, are nil.
- f) Lack of Inputs: Apart from this, the steps taken by the government in order to provide the farmers with the seeds, and inputs required to produce agricultural products at a subsidized rate is unavailable to all the farmers. The distribution mechanism is very poor.
- g) Loss at Production stage: There is even a possibility that the crops are lost while the production. It can be caused because of a number of reason. For e.g., in a particular year, the inputs to buy the seeds and the fertilizers and pesticides were enough, but due to lack of rains, the crops production was minimal or lost. In such a scenario, the agricultural production is lost at the production stage itself.
- h) Consumption: It is no news to us that the food available, when goes out for consumption is also wasted. Every year we can witness cases where food is wasted at a domestic household. There are even instances where food does not reach the population. This is also a challenge in the agricultural sector.

Apart from all this challenges, the intervention of the State and/or the Centre has not been significant throughout the years. The production, consumption and distribution mechanism is not influenced by the sustainable development. It is indeed a fact that the maximum pollution and degradation of natural resources happens because of the inefficient use and over- exploitation of resources in the agricultural fields. The legislations in this regard as well are silent. As discussed earlier, there are a lot of statutes

enacted towards the sustainable development and environment protection, but still, the laws regarding a sustainable use of agricultural produce is absent.

For e.g., in the Air (Prevention and Control of Pollution) Act, 1981²⁵ is silent on the open burning of the crop residues which is one of the major contributors to air pollution. Apart from that the water which is used on the agricultural field, when contaminated with the chemicals, there have been no provisions for treatment of those waste water in the Water (Prevention and Control of Pollution) Act, 1974.²⁶

Recently there was introduction of Farmer's Bill, 2020.²⁷ One cannot find the terms "sustainable development" or "circular economy" in the said Act. One can conclude from this that the challenges in the agricultural sector still are more focused on farmers' improvement on standard of living. But this can be achieved through the means of Circular Economy.

C. PROMOTION OF SUSTAINABLE DEVELOPMENT GOALS THROUGH CIRCULAR ECONOMY IN INDIA

We have discussed how circular economy is an effective mechanism in attaining sustainable development and thus also achieving, sustainable development goals. There are certain Sustainable Development Goals²⁸ which are directly interlinked with the Agricultural Sector.

a) SDG #2: Zero Hunger

According to various researches and surveys, the lack of food is because of the lack of proper infrastructure. Every year the food production is abundant but the distribution, or the storage facilities are so poor that the food produced is wasted. In India, there has been a significant increase in the food production but the challenges of improper infrastructure lead to those produces going to waste. There have been a lot of schemes and regulations in order to improve the productivity and to help the

²⁵ Amended in 1987. Read with Air (Prevention and Control of Pollution) Rules, 1982.

²⁶ Amended in 1988.

²⁷ It included the Farmer's Produce Trade and Commerce (Promotion and Facilitation) Bill, the Farmers' (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, and Essential Commodities (Amendment) Act.

²⁸ Sustainable Development Goals (SDGs) comprise of 17 goals which were designed towards the common goal of sustainable development. They were set by the United Nations General Assembly in one of their conferences in the year 2015. They are also known as Agenda 2030.

farmers but the food wastage is not eliminated by these strategies. There needs to be adoption of the climate smart sustainable agriculture.²⁹

b) **SDG #12: SUSTAINABLE PRODUCTION AND CONSUMPTION**

This SDG is focused on optimum utilization of resources and promoting sustainable infrastructure. The main concern of this goal is to use less resources and in the most effective and efficient manner (Circular Economy). It also states the importance of preventing and managing pollution and wastes. A sustainable food chain supply which involves the producer and ends at the consumer needs to be well educated about the importance of sustainability and circular economy.

IV. RECOMMENDATIONS AND SUGGESTIONS

The following are the recommendations and the suggestions:

- a) Introduction of Sustainable Development and the concept of Circular Economy in India through the legislatures.
- b) Usage of Drip Irrigation Method or Sprinkler System to avoid unnecessary use of Water
- c) Introduction of Storage Facilities so that the food processed is not wasted due to lack of storage infrastructure
- d) Empowerment of the Farmers and equity among all so that every farmer can avail the benefits of the schemes and regulations to aid them.
- e) Using the crop residues as a means to generate electricity. The agricultural produce has the ability to produce tons of electricity by burning them. But instead of open ground burning, proper institution to burn and generate electricity should be established.³⁰
- f) The wastewater must be treated and used again in the agricultural fields to avoid wastage.
- g) The crop residue can also be used as natural fertilizer. This will ensure the integrity of the land and the use of chemicals must be minimized.

²⁹ SDG India (Index and Dashboard) 2019-20; NITI AAYOG

³⁰ Such methods are already being practiced in the regions of Punjab, Haryana and Rajasthan.

V. CONCLUSION

In this paper we came across the history of wastes, of sustainable development and environmental protection so as to understand why there was a requirement of introducing the concept of circular economy. We later also see the concept of circular economy and its benefits to the society. Then in the next section we focus on the agricultural sector of India and the challenges it faces. In the same section we also come across how the implementation of circular economy in agricultural sector can help us attain the goals for this sector. During the current times, the production and consumption pattern has changed and in order to fulfill all the human needs and also look after the needs of the future generation, it is important to think of ways which can sustain the huge population of the world, the present as well as the future needs.

VI. **BIBLIOGRAPHY AND REFERENCES**

1. Daiva Banaite & Rima Tamosiuniene, *Sustainable Development: The Circular Economy Indicators' Selection Model*, Journal of Security and Sustainability Issues, Vol. 6 No.2, Dec. 2016
2. Reports of the Finnish Environment Institute, *Circular Economy for Sustainable Development*, 2018; syke.fi/publications
3. National Institute of Agricultural Marketing, *Handling of Agricultural Wastes in APMCs*, Research Report 2011-12
4. Organization for Economic Cooperation and Development, *Review of Agricultural Policies in India*, 2018
5. Yes Bank Limited, *Circular Economy: A Business Imperative for India*, 2018
6. NITI AAYOG, *SDG India: Index and Dashboard 2.0*, 2019-20
7. NSO INDIA, GOVERNMENT OF INDIA, *Sustainable Development Goals: National Indicator Framework Progress Report*, 2020
8. FICCI, *Accelerating India's Circular Economic Shift*, 2018
9. The Constitution of India
10. www.unenvironment.org
11. www.un.org

12. www.ellenmacarthurfoundation.org

13. www.reports.weforum.org