

Combating Plastic Pollution with Renewable Resources

written by Saarani Vengadesen | 22/06/2023

[Plastic](#) is an essential part of daily life that could be produced to be more environmentally friendly using renewable resources. It is a material that humans depend on and has been widely used since hundreds of years ago in important fields, including medical industries, buildings, transportation, and packaging. Many consider it sustainable due to its inexpensiveness, light material, and convenience.

However, they are non-renewable resources derived from fossil fuels that can take many years for them to decompose. Fossil fuels are [hydrocarbons](#) that can take a million years to produce energy resources for various fields and uses.

The accurate time frame for the depletion of fossil fuel is hard to predict as it depends on the consumption rate by humans and the amount of supply left. The limited supply of this resource has become a bigger problem as the world's population rises.

Furthermore, a problem discovered during the production and burning of fossil fuels is the toxicity released to the air and the ocean when a high amount of [carbon dioxide](#), CO₂, is released. While limiting the usage rate is the only current solution, it is certainly not enough to sustain the massive energy needed to produce plastics.

Since plastics are critical to modern life, the discovery has brought scientists to develop a sustainable solution to produce plastics derived from renewable sources instead of non-renewable resources derived from fossil fuels.

One that has been introduced is biodegradable plastic. Specifically, it is [polylactic acid](#) (PLA), produced from fermentative lactic acid through dark fermentation of food waste. The bacteria can easily degrade them when certain conditions are met.

The decomposition of lactic acid by microorganisms would emit CO₂, but this is effectively carbon stored in the plant matter that originally produced them. As a result, the net [greenhouse gas emissions](#) are close to zero, significantly improving renewable-sourced plastics' efficacy.

The discovery has positively impacted economics as biodegradable plastics have caught the market's attention. Some companies, such as Ecoware, have also opted for green plastics to reduce their carbon footprint, which can benefit both producers and customers due to the increasing awareness of pollution.

Moreover, the production of renewable-sourced plastics does not compete with agricultural land. In 2019, only 0.016% of land was used for their raw materials to produce plastics, as stated in European Bioplastics, and it may grow to 0.021% in 2024.

This clearly shows how the production of food is not affected by the use of crops for plastic production, so this method should continue to limit the use of fossil fuels because the greenhouse gas emissions associated with the production are lower. Thus, it has served the economy and the environment greatly.

Despite all the benefits, biodegradable plastic is often viewed wrongly as material that can be freely thrown away in the environment and will be fully decomposed. Two years ago, a study was published regarding how scientists tested whether the supposedly biodegradable bag would break down after being left in the ocean for three years. They cannot break down in the ocean without meeting the requirements to decompose. Although the material is easier to break down, improperly discarding them is harmful to the planet and society.

In summary, using renewable-sourced plastics is a helpful initiative to reduce the use of fossil fuels and CO₂ emissions by identifying the economic and environmental impacts. Having sustainable plastics produced has benefited society in many ways, which is possible due to polylactic acid (PLA) derived from waste products. However, it is not the definite answer to combatting plastic pollution, as it depends on how responsible producers and consumers are. Therefore, scientists could develop a further enhanced solution to the problem.

Aisya Sofea Zamari is studying for a Bachelor of Arts in Psychology at the [University of Queensland](#).