

# REGENERATIVE AGRICULTURE: CIRCULAR ECONOMY IN AGRICULTURE

Regenerative agriculture emerges as a valid alternative to the agro-industrial business that has caused environmental degradation and led to the loss of natural resources over the past 200 years. The problems arising from urbanization and agribusiness, such as extensive agriculture, desertification, genetic erosion, and climate change, are particularly pronounced in peripheral and developing countries.

Regenerative agriculture and the circular economy have gained relevance in the current context, where food security and sustainability are central issues. In this framework, a critical analysis can be carried out on the need to adopt a sociopolitical approach to promote the development of circular agriculture. The COVID-19 pandemic has highlighted social vulnerabilities in the food system, revealing in an alarming increase in global food insecurity, which has risen from 8.4% to 10.4% of the world's population in just one year. This increase not only poses immediate challenges in terms of nutrition but also underscores the urgency of transforming agricultural systems toward more sustainable practices.

Carbon emissions in agriculture hinder the achievement of crucial climate goals, such as the limit of 1.5°C on global warming. In this context, the application of the circular economy in agriculture is presented as a key strategy. The goals of the circular economy are to minimize or eliminate the use of non-renewable materials and maximize their reuse. This shift from a traditional linear model to a circular one not only seeks to reduce waste and pollution but also has the potential to decrease greenhouse gas emissions through the recycling of raw materials, agricultural waste, and fertilizers.

One aspect to highlight is the role of bioenergy, which can act as an important ally in circular agriculture. The production of biogas, generation of clean energy, and production of biofertilizers are some of the practices that can complement each other to foster a more sustainable agricultural system. Thus, the development of bioenergy and

the reduction of carbon emissions become recurring topics in the discussion on circular agriculture. We establish a theoretical framework that addresses current challenges and proposes innovative solutions for the intersection between regenerative agriculture and the circular economy.

The intersection between circular agriculture and the social challenges that have emerged as a result of the COVID-19 pandemic highlights how the growing food insecurity and the increase in global hunger in 2020 underscore the vulnerability of the food system, indicating an urgent need to rethink current agricultural practices.

The traditional linear agricultural development model is characterized by inefficient resource use and pollution generation. This approach not only contributes to environmental degradation but also hampers the achievement of global climate goals. In contrast, the circular economy in agriculture presents a viable solution that seeks to minimize the use of non-renewable materials and maximize their reuse. This strategy not only has the potential to reduce greenhouse gas emissions but also promotes sustainability through the recycling of raw materials, waste, and fertilizers.

Regenerative agriculture, in its essence, offers a holistic vision that combines ecosystem health with agricultural production. Therefore, it provides a new perspective and opportunities to address current issues of degradation and environmental sustainability. Ultimately, it will not only benefit environmental health, but also be more profitable and sustainable for producers as they transition to the circular economy model.

LEONARDO A. VIQUE GONZÁLEZ  
Faculty of Agrarian Sciences  
Universidad de la Empresa  
Uruguay