THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
November 2024 Vol.4(11), 5121-5124
Popular Article

# Circular Economy in Agriculture: A case of Andhra Pradesh Community-managed Natural Farming (APCNF)

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https://doi.org/10.5281/zenodo.14205641

***Abstract***

This article explores the potential of circular agriculture to address the challenges faced by the global food system. By focusing on the case of Andhra Pradesh Community-managed Natural Farming (APCNF), the study highlights the benefits of adopting sustainable agricultural practices. APCNF, inspired by the principles of zero-budget natural farming, emphasized minimizing external inputs, regenerating soil health and promoting biodiversity.

***Keywords:*** Circular economy; circular agriculture; sustainable farming; organic farming

## Introduction

The global food system faces a formidable challenge of feeding a projected one-third increase in the global population by 2050. India, a significant agricultural nation, is particularly vulnerable to this challenge, compounded by the adverse impacts of climate change. Rising temperatures, erratic rainfall patterns and extreme weather events are increasingly disrupting agricultural production, leading to significant yield losses. Furthermore, India generates a staggering 500 million tons of agricultural waste annually. The inefficient disposal of this waste, primarily through open burning, not only contributes to air pollution and greenhouse gas emissions but also represents a substantial loss of valuable resources.

To address these multifaceted challenges, a paradigm shift towards sustainable and regenerative agriculture is imperative. By embracing climate-smart agricultural practices, such as precision agriculture, organic farming and the adoption of drought-resistant crop varieties, India can mitigate climate change impacts, enhance soil health and improve agricultural productivity. Additionally, the transformation of agricultural waste into biofuels and other value-added products offers a dual benefit of addressing waste management and contributing to renewable energy generation [1].

Ultimately, a circular economy approach, characterized by resource efficiency, waste



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*Published 22/11/2024*

minimization and ecosystem regeneration, is essential to ensure a sustainable and resilient food system.

**Circular Economy**

Ellen MacArthur Foundation (2013) initially coined the term **circular economy** and defined it as follows: "An economy that is restorative and regenerative by intention and design" [2]. The circular economy is a regenerative economic model that aims to minimize waste and pollution, keep products and materials in use for as long as possible and regenerate natural systems. By embracing circular principles, societies can conserve resources, reduce environmental impact, stimulate economic growth and create a more sustainable future. The key benefits of a circular economy include: resource conservation, waste reduction, energy efficiency, economic growth & job creation, cost saving, climate change mitigation, resilience to supply chain disruptions, consumer engagement & satisfaction, regulatory compliance & risk management as well as long term sustainability.

**Circular Agriculture**

Circularity in agriculture is a way of farming that emphasizes closed-loop systems and minimizes waste while promoting environmental health and resilience [4]. It focuses on regenerating soil health, conserving water and enhancing biodiversity through practices like crop rotation, integrated pest management and organic farming. By adopting circular agricultural practices one can minimise external input usage, regenerate soils, create new employment opportunities, minimise environmental impact and achieve closed nutrient loops, food security and poverty reduction.

**Andhra Pradesh Community-managed Natural Farming (APCNF)**

APCNF is a prominent example of circular agriculture in India. This capacity building programme was initiated in 2016 by Rythu Sadhikara Samstha (RySS) and marks a significant endeavour towards promoting natural farming practices in agricultural communities [5]. APCNF is based on Dr Subhash Palekar's spiritual farming model, known as zero budget natural farming (ZBNF), which was developed on the principles of forests growth. However, RySS has adapted the model to suit local conditions. Two significant improvements include:

1. **Flexible Livestock:** To address the scarcity of desi cows, RySS promotes the use of dung and urine from any livestock for preparing essential natural fertilizers.

2. **Innovative Sowing Technique:** To protect soil microbes during the hot summer months, RySS introduced Pre-Monsoon Dry Sowing (PMDS), a method for growing crops with minimal soil moisture.

Apart from the above modifications, RySS is continuously experimenting and refining



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the principles of natural farming, drawing inspiration from traditional Indian agricultural practices. The APCNF model is constantly evolving, incorporating new insights and techniques. The updated universal principles of natural farming designed by RySS are listed below:

1. Soil to be covered with crops 365 days (Living Root)
2. Minimal disturbance of soil
3. Bio-stimulants as necessary catalysts
4. Usage of indigenous seed diverse crops, trees: 15 -20 crops
5. Integrate animals in to farming
6. Increase organic residues on the soil
7. Pest management through botanical extracts
8. No synthetic fertilizers, pesticides, herbicides

Under this initiative, each RySS personnel undertakes the responsibility of guiding and supporting 100 farmers, providing them with comprehensive trainings and field demonstrations aimed at fostering the adoption of natural farming techniques. This grassroots approach ensures that farmers receive personalized guidance and hands-on experience in implementing natural farming techniques. By fostering a deep understanding of sustainable agricultural practices, RySS aims to empower farmers to make informed decisions and adopt methods that are both environmentally friendly and economically viable.

**Impact of APCNF**

The adoption of APCNF has significantly benefitted farmers by reducing costs and increasing the market value of their produce. According to the annual assessment report published by APCNF, farmers practicing CNF saved an average of Rs. 9,389 (16%) per hectare on input costs compared to conventional farmers. Additionally, CNF farmers achieved an average gross value of output that was Rs. 10,501 (11%) higher per hectare compared to non-CNF farmers. This indicates a preference for higher market prices for crops produced under CNF practices. Furthermore, many APCNF farmers have reported significant improvements in soil health and crop quality, leading to enhanced sustainability and productivity over time. By reducing reliance on chemical inputs and adopting natural farming practices, APCNF has also contributed to the financial stability of farming households by reducing debt levels.

**Conclusion**

The adoption of circular agriculture, exemplified by the APCNF initiative, offers a promising pathway toward sustainable and resilient food systems. By minimizing external inputs, closing nutrient loops and regenerating soil health, CNF contributes to a healthier



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environment and improved agricultural productivity. The economic benefits of CNF, including reduced input costs, higher market prices and increased farmer incomes, underscore its potential to enhance the livelihoods of farming communities. As the world grapples with climate change and resource scarcity, the principles of circular agriculture offer a valuable framework for building a more sustainable future. By promoting sustainable practices, such as organic farming, crop rotation and integrated pest management, CNF can help mitigate climate change, conserve biodiversity and ensure food security for generations to come.

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***Published 22/11/2024***