

Some Overviews on Organic Agriculture Apply Circular Economy

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Abstract

The paper provides an overview on agriculture apply circular economy (CE). It provides the concepts of circular economy and organic agriculture. The paper used secondary researches from topics, documents related to organic agriculture apply CE. With results which the previous studies mentioned, the paper bases on different CE theoretical approaches to clarify the concept of organic agriculture in the direction of circular economy.

Keywords: organic agriculture, circular economy

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1.Introduction

A circular economy (CE) is 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 aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models (The Ellen MacArthur Foundation, 2013). Therefore, it is a viable alternative to a traditional linear economy, based on hyper production and based on the wastes: that is currently produced with frenzied pace, using the well for more limited periods (shrinking product life cycles materials) and grow the waste, even the most recyclable. (UCi, 2015). The circular economy (CE) concept is gaining traction as a sustainable strategy for reducing waste and enhancing resource efficiency. On the political agenda and in particular Europe, topic CE is mentioned strong and expected to promote economic growth (EC, 2015). The CE has been applied in the developed countries and in the manufacturing, agricultural, textile, and steel industries but its implementation varies.

With agricultural sector, to food Security and the 2015–2030 Sustainable Development Goals, a key role in the pursuit and implementation of circular economy is taken by investments in innovation and technologies that enhance the scraps of industrial and / or agricultural sectors (Adriano Ciani et al, 2016).

In the face of problems of environmental pollution and food safety for human health, changing the development method in order to effectively use scarce resources is a necessary requirement. One of the changes being made is the transition from a linear economy to a circular economy by countries in order to achieve sustainable development goals and respond to climate change. At the same time, organic agriculture has also become an agricultural revolution that many countries around the world have towards. It is more beneficial when select organic farming than conventional agriculture in sectors of a healthy environment, the economy, and the community. National action plans, including market access, consumer demand, and organic standards, are applied to organic agricultural plans in developed countries such as in Europe, Japan, North America, and Oceania (Constance & Choi, 2010; Janssen & Hamm, 2014; Offermann, Nieberg, & Zander, 2009; Vairo, Häring, Dabbert, & Zanoli, 2009).

Thus, organic agriculture development should be an option for farmers to live in a good environment, raise their income, and to become sustainable in the future.

This paper aims to contribute with an overview of organic agricultural development applying the CE principle and methodology the theory of planned behavior (TPB) (Icek Ajzen, 1991). That is introducing the Circular Economy, organic agriculture and the theory of planned behavior by presenting their origins, synthesising their conceptual definition. From there discussing about the contributions of this research, its limitations, and interesting fields for further research.

2. Research method

The paper collects and analyzes research datas including studies, topics that have been carried out in primary research, basic research and development research related to topic.

Firstly, the authors selected articles and research related to main keywords “organic agriculture”, “circular economy”. Secondly, basing on the quality and reliability of the studies, research team conducted filtering the content and range ones had a high degree of relevance with subject. From there, the issues, levels and scope posed in related works, point out research gap in previous studies.

3. Literature review

3.1. Circular economy concept and sustainable development

The concept of the Circular Economy (CE) has been gaining momentum since the late 1970s (The Ellen MacArthur Foundation, 2013) by describing how natural resources influence the economy by providing inputs for production and consumption as well as serving as a sink for outputs in the form of waste, they investigate the linear and open-ended characteristics of contemporary economic systems. CE has become a topic of interest to scholars, researchers, and development practitioners in many fields, and has recently been seriously considered by many countries when included in their policy systems. The contemporary understanding of the CE and its practical applications to economic systems and industrial processes has evolved to incorporate different features and contributions from a variety of concepts that share the idea of closed loops. Some of the most relevant theoretical influences are cradle-to-cradle (McDonough and Braungart, 2002), laws of ecology (Commoner, 1971), looped and performance economy (Stahel, 2010), regenerative design (Lyle, 1994), industrial ecology (Graedel and Allenby, 1995), biomimicry (Benyus, 2002), and the blue economy (Pauli, 2010).

The concept has also gained traction with policymakers, influencing governments and intergovernmental agencies at the local, regional, national, and international level (Martin Geissdoerfer et al, 2017). Germany was a pioneer in integrating the Circular Economy into national laws, as early as 1996, with the enactment of the “Closed Substance Cycle and Waste Management Act” (Su et al., 2013). Europe has recognised the risks and the benefits of moving to a more resource-efficient society, as set out in the Europe 2020 strategy for smart, sustainable and inclusive growth United States with market-based approaches to waste since 1677 (Nam Nguyen Hoang et al, 2018). In Asia, Japan initiated with the Basic Law for Establishing a Recycling - Based Society (The Basic Law for Establishing a Recycling - Based Society) in 2002 (OECD, 2002). The circular economy (CE) has been chosen as a national policy for sustainable development in China. The Chinese central government has adopted CE as a national regulatory policy priority introducing numerous regulations to support and build its implementation. The Circular Economy Promotion Law was approved. This law promotes the development of the circular economy, improving resource utilization efficiency, protecting the natural environment and realizing sustainable development. A methodological development initiative can ensure the enforcement of both the Cleaner Production Promotion Law and the Circular Economy Promotion Law and alleviate national environmental pressures. The indicator development policy also creates incentives and motivations for local governments to pay more attention to specified environmental issues. (Yong Geng et al, 2012)

Referring to the circular economy, Rashid et al. (2013) argue that in economic models and supply chains, circular economy is essential for sustainable production. Similarly, Lapple (2007) also argues that the circular economy is an important element of sustainable development. Ellen MacArthur Foundation (2013) evaluates the relationship between circular economy and sustainable development at a higher level when considering circular economy as a necessary condition of sustainable development. Webster (2015) also agrees with this view. Especially, in the environmental aspect, Backer et al (2014) consider circular economy as a mandatory condition for the sustainability of economic results. This view also received the consensus of the United Nations Environment Program (2006) when assessing the circular economy as a necessary condition for maintaining sustainable economic growth. When studying the relationship between green growth, green economy, circular economy and sustainable development.

3.2. Organic agriculture, circular economy in organic agriculture

The agriculture sector is relatively unique in that they rely on natural resources and cycles as their primary inputs. Resources such as water, soils, nutrients and biodiversity underpin the functioning of ecosystems and the land that provides the space in which we work.

There are many explanations and definitions for organic agriculture but all converge to state that it is a system that relies on ecosystem management rather than external agricultural inputs. “*Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system*” (FAO/WHO Codex Alimentarius Commission, 1999). One of the most accepted definitions is given by International federation of organic agriculture movements (IFOAM) along with its principles of health, ecology, fairness and care: “*Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved* (IFOAM, 2015).

Organic agriculture directly contributes to ecosystem preservation and restoration of natural resources, rural development and prevention of land abandonment. Organic farming leads to stabilization of farmers’ incomes by

entering new, emerging market of healthy food products. The development of organic agriculture can contribute not only to significantly reduced greenhouse gas emissions and carbon sequestration in soils and biomass but also to reduced use of transport fuels, fertilizers, plant protection against chemicals and others. On the other hand, appropriate crop rotation providing good soil water reserve and rapid water infiltration during heavy rains are the basis for adapting agricultural systems to climate change (European Commission, 2013).

Hence, the organic production is a production method which puts the accent on wise use of resources, environmental protection, health and safety to the greatest extent and responds to the concept of circular economy.

The concept of circular economy in agriculture has consensus among scholars. Accordingly, the circular economy in agriculture is understood as the application of the principles of the circular economy (3R principles: reduce - reuse - reuse) in agricultural production in the direction of reducing inputs, resources, reducing waste generation and discharge in the production process and in the product's life cycle to ultimately achieve the goal of agriculture and eco-friendly development (Qi et al, 2016; Jun 2011) .

Much developed countries such as in Europe, Japan, North America, and Oceania have national action plans, including market access, consumer demand, and organic standards, are applied to organic agricultural plans (Constance & Choi, 2010; Janssen & Hamm, 2014).

3.3. Organic agriculture development apply circular economy principles

Some researches have focused on motivational factors relating to the adoption of organic agriculture. They include socioeconomics characteristics, farm characteristics, attitudes, perception risks, sources of information, and national policies, influence farmers' decision making. The attitudes are direct determinants of intention and behavior. The decision-maker's opinion is dependent upon judgment and behavior and using the Theory of Planned Behavior (TPB) to explain a decision-maker's attitude towards performing behaviors (Fishbein & Ajzen, 1975).

The study about factors impacting on farmers' decision to convert from conventional to organic agriculture in Thailand. Waripas Jiumpanyarach used the theory of planned behavior and logit model to find out the impacting factors of farm in conversion from conventional agriculture to organic agriculture toward the intention to change behavior, attitudes, and decision-making. The result suggested that farmers' long-term benefits were implementation of agricultural policies supporting equipment, financial resources, knowledge, green technologies, training, and extension (Waripas Jiumpanyarach, 2021).

To evaluate production technique is more efficient between organic conventional farm. Analysis estimated that efficiency plays a crucial role into the factors affecting productivity in the organic process (Fabio A. Madau, 2007).

Koesling, M., Flaten, O. and Lien, G. (2008) used a 7-level Likert scale of future farming practices (2009) to identify/classify 4 groups of farmers: farmers are organic farming, farmers have potential/intention to convert to organic farming; uncertain farmer (no plan); and traditional farmers, with no plans to convert. The results of the polynomial logit model show that farmers tend to switch to organic farming if they have a lot of agricultural land, have a higher education level, have a degree in agricultural training, and are located near other areas urban, is a crop farmer. Farmers tend to switch to organic farming if they have a view of the goal of sustainable and environmentally friendly farming, and vice versa, if the farmer is for the goal of "reliable and stable income", "determined", "profit maximization" or "farm improvement for the next generation" tend not to switch to organic farming.

Most farmers in the study area decided to maintain conventional practices because of the appetite for, and aversion to agricultural risks (financial risks, production risks, quality and safety risks, and marketing risks). Thai farmers have opportunities due to good natural resources, but the infrastructure is limited.

The reasons for adopting organic agriculture were separated into three categories: (1) knowledge and understanding; farmers understood healthy farming but had little organic farm management information; (2) farm size impacts the costs of production; and (3) farm economics, including costs of delivery, storage, and markets, were a barrier to organic farming. These influenced attitudes, group norms, and perceived behavior (Waripas Jiumpanyarach, 2021).

Based on the theory of planned behavior, QinghuaZhu et al, 2013 develop a conceptual model which proposes that internal influencing factors of consumers mediate the relationships between external influencing factors and green food consumption intention while context factors such as purchasing convenience moderate the relationships between green food consumption intention and behaviors.

4. Conclusions

The circular economy is closely linked to agriculture and today is a topic of great current international political and economic agenda. Researches mention different aspects of circular economy, organic agriculture. For developing organic agriculture to be sustainable in the long term, it is necessary to reflect the principles and activities that are at the core of the circular economy and of the biological systems on which they depend. The goal of organic agriculture apply circular economy is to move toward sustainable development through making use of

organic waste to become a beneficial resource for the above agricultural activities and for many other fields. The efficient use of natural resources and ecosystems, saving production costs by considering use them optimally. The organic agriculture apply circular economy products safe products, protects famer and consumers as well as meet market demand.

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