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Drivers and Barriers Towards Circular Economy in Agri Food Supply Chain

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Abstract: Over the past few years the concept of circular economy has captured considerable attention from researchers and practitioners as a potential solution for social, economic and environmental challenges. But in literature limited attention has been given to explore the circular economy initiatives in agri-food supply chain. This paper aims to address this gap by critically reviewing the existing literature and identify the drivers and barriers for implementing circular economy in Agri Food Supply Chain. The study adopts the systematic literature review approach proposed by Kitchenham (2004). In this study we examined the popularity of the Circular Economy drivers and barriers in Agri Food Supply Chain in accordance with the number of times the drivers and barriers appeared in the research studies which shows that environmental (67%), policy and economy (47%) and financial benefits (43%) are the three top drivers. Whereas institutional (64%), financial (48%) and technological risks (40%) are the top three barriers in implementing circular economy practices in Agri food supply chain.

Keywords: Circular economy, barriers, drivers, agri-food supply chain

Introduction: The Changing socio-economic and regulatory landscape, resources price instability, burgeoning regulatory pressure on waste, emission of greenhouse gases and climate change poses big questions for traditional linear economic business models approach (Jawahir and Bradley, 2016; Govindan and Hasanagic, 2018). Whereas, circular economy (CE) keeps the resources in closed loop supply chain. It replaces the traditional linear economy of “take-make-consume-dispose” into a circular system including maintenances, repair, reusing, refurbishing, remanufacturing and recycling to ensure the little or zero generation of waste. According to Food and Agriculture organization (FAO, 2011) about one-third (~1.3 billion tons) of the all food produced in the world is lost or wasted globally. Food loss and waste happening throughout the entire food supply chain from farm production to final household consumption (Parfitt et al., 2010; Kummu et al., 2012).

The research related to Agri-food supply chain (AFSC) integrated to CE philosophy has been scarce in the existing literature. The purpose of this paper is to address the gap by critically reviewing the existing literature and identify the key barriers that impede the process of Agri-circular economy and also identify the enablers that catalyse the implementation of CE concept in AFSC.

Methodology: A systematic literature Review (SLR) is a systematic, comprehensive and reproducible technique for identifying, evaluating and interpreting all the available research produced by researchers and scholars relevant to a particular research question or area of interest. For conducting Systematic literature review we are following Kitchenham (2004) guidelines.

For systematic literature review the author mainly used ScienceDirect, Willy, Tylor & Francis, SpringerLink, Emerald and Web of Science data bases. The selection of the research study is based on the predefined inclusion and exclusion criteria. These articles are scrutinised for full reading if they meet the inclusion criteria. In order to reach our final papers for review, initially 884 papers were found using the keywords designed (e.g. Circular Economy, Agri-Food Supply chain, Supply Chain Management, Closed Loop Economy, Sustainability). Finally, 58 papers were selected for the review. These papers were read to their entirety to ensure empirical

relevance. An inductive qualitative content analysis approach was used to identify the drivers and barriers related to circular economy in AFSC in the examined literature. There are six themes for drivers; policy and economy drivers, financial benefits, Environmental protection, health benefits, social benefits and innovative solutions. Whereas six themes came under barriers; financial and economic risks, Logistical and Infrastructural risks, operational risks, knowledge and skills risks, technological risks, public policy and institutional risk.

Findings: The key findings of the study are that government intervention to stipulates the adoption of CE initiatives plays an important role which was identified as second major driver in the study. It was found that adopting CE approach for producing food commodities and environmental restoration is highlighted as major driver in this analysis as most of agricultural products rely on a lot of environmental factors. Financial benefits in terms to pursue the highest profit by consuming the waste and reuse of it as “green” economy emerged as a third most important driver which can be an important factor toward attaining economies of scale in this rapidly changing and volatile industry.

The findings also depict that finance has appeared to be the most persistent key barrier. The high upfront investment costs regarding implementation of CE practices, generally increases the importance of government role to provide support and required subsidies. Enterprises are mostly profit oriented and profits come before environmental impacts, it is for government to impose laws and policies that the businesses should follow. Lack of waste treatment facilities and insufficient availability of relevant technology is a crucial challenge for the transition towards CE. Inadequate infrastructure facilities in reverse logistics is the fourth major barrier in adoption of CE initiatives and this failure is transmitted throughout the entire supply chain. Meanwhile lack of knowledge and skills is among the pressing barriers limiting the implementation of CE. The operational risks rank as the least persistent barrier in the existing literature.

Conclusion: The AFSC is one of the most important industries in terms of economic returns and feeding the nations. To maintain the industry competitiveness, preserve the natural resources and lessen the environmental afflictions created by it, an efficient and sustainable system is fundamental. Moreover, the soaring growth rate of world population is exerting more pressure on natural resources and this population pressure is making the shift from tradition linear system to circular economy imperative. This great need urges the researchers to explore the concept of CE particularly in Agriculture sector. The authors strongly believe that circular economy is a promising concept for sustainable development. It is also found that there is an utmost need for international communities to introduce internationally accepted standard and frameworks for circular economy practices to be used globally to eliminate the waste. Also limited available research regarding implementation of CE initiatives in AFSC requires further exploration of the advantages and scope associated with it.

References:

- Borrello M., Lombardi A., Pascucci S. and Cembalo L. 2016. The seven challenges for transitioning into a bio-based circular economy in the agri-food sector. *Recent patents on food, nutrition & agriculture* 8(1):39-47.
- Govindan K. and Hasanagic M. 2018. A systematic review on drivers, barriers, and practices towards circular economy: a supply chain perspective. *International Journal of Production Research* 56(1-2): 278-311.
- Jawahir I.S. and Bradley R. 2016. Technological elements of circular economy and the principles of 6R-based closed-loop material flow in sustainable manufacturing. *Procedia CIRP* 1(40): 103-108.
- Kitchenham B. 2004. Procedures for performing systematic reviews. Keele University, 33: 1-26.
- Food and Agriculture Organization of the United Nations 2011. Food Wastage Footprint Full-cost Accounting: Final Report. FAO, Rome, Italy.
- Kummu M., De Moel H., Porkka M., Siebert S., Varis O. and Ward P.J. 2012. Lost food wasted resources: Global food supply chain losses and their impacts on freshwater, cropland, and fertiliser use. *Science of the Total Environment* 1(438): 477-489.
- Parfitt J., Barthel M. and Macnaughton S. 2010. Food waste within food supply chains: quantification and potential for change to 2050. *Philosophical transactions of the royal society B: biological sciences* 365(1554): 3065-3081.