TOWARDS CIRCULAR PRODUCTION IN THE COCONUT VALUE CHAIN: ACTOR ROLES, LINKAGES, AND CONSTRAINTS IN KILIFI COUNTY, KENYA

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INTRODUCTION

Coconut waste management is a significant challenge in Kenya

In the coconut value chain, waste is generated at various nodes such as production (coconut leaves and husks), distribution (coconut shell and husks), processing (copra meal), and consumption (coconut shell). Dulo et al. (2022) estimated that the total coconut production in Kenya in 2018 was 105,000 metric tons (MT), of which 47% was estimated to be potential waste, translating to 49,000 MT.

In Kenya, like many other developing countries, coconut waste generated is mismanaged and often disposed of in landfills or water bodies, left in the open to rot or burning without energy recovery, which leads to environmental pollution and amplifies the effects of climate change through greenhouse gas (GHG) emissions(Ajien et al., 2023; Doe et al., 2022). Furthermore, owing to the prevalent tropical climate, the pile of coconut waste left to rot often becomes a habitat for mosquitoes, pests, and rodents, and hence becomes a nuisance with corresponding health implications.

Circular economy (CE) offers potential solutions for sustainable waste management

Research has shown that coconut waste can be used at the production and processing levels to produce technical materials such as mats; cocopeat and compost; briquettes and activated charcoal coconut flour and livestock feed(Munib, 2021; Stelte et al., 2023; Side et al., 2022; Nunes et al., 2020; Obeng et al., 2020 Karandeep et al., 2019; Silva et al., 2021). Therefore, the utilization of coconut waste biomass from a circular economy perspective can meet the current and future societal needs for food, feed, fuel, and fiber while promoting social, economic, and environmental benefits by minimizing trade-offs.

OBJECTIVES

- Identify key actors in the coconut value chain
- Analyze roles and linkages of stakeholders
- Assess stakeholder influence on circular economy transition
- Identify perceived benefits and constraints of CE adoption

METHODOLOGY

- Study area: Kilifi County, Kenya
- Data collection: Participatory workshop using Net-Map methodology
- Social Network Analysis (SNA) tool
- Key informant interviews
- Data analysis: UCINET 6 software for socio-grams and centrality measures

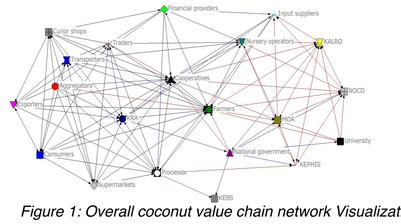

Figure 1: Overall coconut value chain network Visualization.

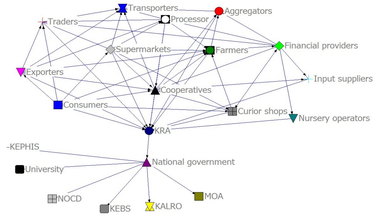

Figure 2: Information network visualization.

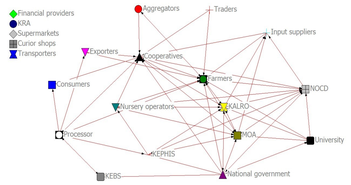

Figure 3: Product network visualization.

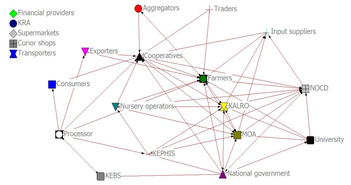

Figure 4: Finance network visualization.

RESULTS

Stakeholders identified

A diverse group of 21 stakeholders were identified during the discussions, who influenced the transition towards a circular economy within the coconut value chain.

Key influential actors:

The key actors include processors, the Ministry of Agriculture, Livestock, and Fisheries (MOALF), National Coconut Development Authority (NOCD), Kenya Agricultural and Livestock Research Organization (KALRO), farmers, and consumers. These actors collectively engage in a range of roles and collaborative efforts that enhance and promote various circular practices in the coconut value chain.

Information network:

The information network map is shown in Figure 2 reveals that most actors in the network are linked, with the majority of nodes being around farmers and cooperatives. Net-Map reveals that government-owned stakeholders, such as MOALF, NOCD, and KALRO, play a key role in information dissemination.

Product network:

For product flow, Net-Map (Figure 3 shows that the product flow was mostly one-way links, from farmers, cooperatives, or traders. It was noted that Net-Map was dense around farmers and cooperatives.

Finance network: KRA and private sector financial institutions dominant

The findings of the sociogram (Figure 4) indicate that financial providers and the Kenya Revenue Authority (KRA) play a major role in finance flow in the coconut value chain. The centrality measures revealed that KRA had the highest number of ties in relation to finance flow.

Perceived benefits: Reduced pollution, economic opportunities

According to Geissdoerfer et al. (2017) and Velasco-Muñoz et al. (2021), the adoption of circularity innovation value chain actors can repurpose coconut by-products once considered waste to produce food, fiber, and fuel. Value chain actors can sell eco-friendly products, bolster their financial inflows, and foster economic resilience. The utilization of coconut biomass offers a sustainable source of renewable energy with a low carbon footprint compared with non-renewable fossil fuels (Arena et al., 2016; Azeta et al., 2021).

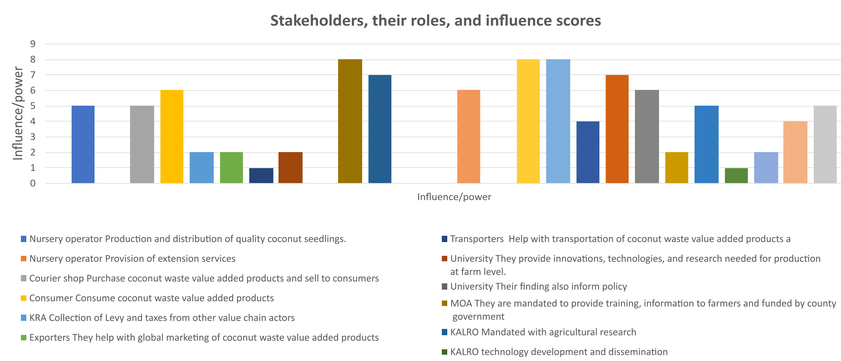

Figure 2: A Column chart showing stakeholders,their roles, and influence scores

CONSTRAINTS

Due to inadequate institutional capacity, such as extension staff and resources in most developing countries, dissemination of information regarding sustainable waste management practices, such as circular economy, is limited. Kimani et al. (2016) and Weyori et al. (2018) stress that the resources and funding provided to extension agents are inadequate to meet the demands of local farmers and other actors. Financial constraints limit the capacity of value chain actors to mechanize coconut production and processing and invest in circular innovations, thereby limiting the adoption of a circular economy. Furthermore, low product awareness limits the market for value-added coconut waste products.

CONCLUSION

- Formation of inclusive farmer groups and cooperatives recommended
- Enhance access to finance for CE adoption
- Implement supportive policies for circular economy practices
- Strengthen partnerships among value chain actors

REFERENCES: List available on request

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