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kuslpdl@gmail.com
Kushal Poudel[1], Dario Valarezo[2], Ioanna Mauratiadou[1], Tor Arvid Breland[3], Dominique Barjolle[1,4]
1 ISARA Lyon, France
2 Origin for Sustainability, Switzerland
3 Norwegian University of Life Sciences, Norway
4. ETH Zürich, Switzerland

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Title: Adoption of circular economy in the coffee sector and improvement of food security and nutrition in Rusizi, Rwanda.

Abstract:

Coffee is an important cash crop contributing to the livelihood of millions of farmers, particularly in developing countries. Nonetheless, its processing creates a substantial amount of waste material, posing a significant environmental threat. Coffee waste holds the potential for converting into cost-effective and easily manageable high-quality compost. This study aims to get behavioral insights about coffee compost adoption in low-income settings and develop compost interventions leading to improving food security and nutrition. The research uses a participatory, and action-oriented approach guided by a mixed-method study including 10 field visits, 30 semi-structured interviews, and a workshop with 15 farmers, coffee washing station leaders and local government officials in the Rusizi District of Rwanda.

Thematic analysis revels that age, gender, perception of benefit and risk, belief about benefits over other composting practices, choice of soil management practices, farm location, financial capacity and governance were the major factors influencing the coffee compost adoption. Farmers applying coffee compost report higher yields and reduced production costs, contributing to enhanced food security through improved coffee and food crop outputs. However, gap in knowledge and financial capacity pose major obstacles. Shared visioning and co-created action plans can help coffee stakeholders to drive change from the local level. Designing composting interventions that focus on use of locally available materials and training on know-how of composting is critical for widespread adoption. The findings suggest that building farmer and cooperative capacity and improving market access are vital to achieving food and livelihood security in resource-poor settings. This study highlights that integrating behavioral insights and agroecological understanding ensures that circular economy models like coffee composting are culturally relevant, collectively owned, and capable of driving lasting adoption.