

# Reviving Agro-Biodiversity: Co-Creating Pecking Orders with Buyers

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## Abstract

This paper proposes a novel approach to address agro-biodiversity decline by engaging purchasers in the co-creation of pecking orders. Agro-biodiversity is crucial for food security and ecosystem resilience, yet it faces significant threats from industrialized agricultural practices. By involving purchasers, such as retailers and consumers, in establishing preferences for diverse agricultural products, this approach aims to incentivize farmers to diversify their crops and cultivation methods. Through collaborative decision-making processes, buyers can influence supply chains to prioritize agro-biodiversity conservation and promote sustainable farming practices. This abstract discusses the potential benefits of this co-creation strategy and highlights its implications for biodiversity conservation and food system resilience.

**Keywords:** Agro-biodiversity; Revival; Co-creation; Pecking orders; Buyers; Conservation; Sustainable agriculture

## Introduction

Agro-biodiversity, encompassing the variety and variability of plants, animals, and microorganisms in agricultural ecosystems, is indispensable for global food security and ecosystem resilience. However, in recent decades, intensive agricultural practices and monoculture cropping systems have led to a concerning decline in agro-biodiversity worldwide. This decline poses significant risks to agricultural sustainability, food production, and environmental health. Addressing this challenge requires innovative approaches that engage stakeholders across the food supply chain [1,2].

This paper introduces a novel strategy for reviving agro-biodiversity by co-creating pecking orders with purchasers. Pecking orders, traditionally used in the context of animal behavior to establish social hierarchies, are adapted here to denote the prioritization of agricultural products based on their diversity and sustainability attributes [3-6]. By involving purchasers such as retailers, restaurants, and consumers—in the decision-making process, this approach aims to incentivize farmers to diversify their crops and adopt more sustainable farming practices. In this introduction, we provide an overview of the current status of agro-biodiversity decline and its implications for food security and environmental sustainability [7,8]. We then introduce the concept of co-creating pecking orders with buyers as a promising strategy to address this challenge. Through collaborative efforts between producers and purchasers, we envision a pathway towards revitalizing agro-biodiversity, promoting sustainable agriculture, and ensuring the long-term resilience of our food systems [9,10].

## Methods and materials

Conduct interviews, surveys, and focus group discussions with key stakeholders in the agricultural supply chain, including farmers, retailers, distributors, and consumers, to understand their perspectives on agro-biodiversity and sustainable agriculture. Review existing literature on agro-biodiversity conservation, sustainable agriculture practices, and consumer preferences to inform the development of the co-creation process. Organize workshops and co-creation sessions with stakeholders to collaboratively establish pecking orders based on criteria such as crop diversity, cultivation methods, environmental impact, and nutritional value. Collect data on current agricultural practices, crop diversity, and market demands through field surveys, market assessments, and farm inventories. Analyze collected data

using quantitative and qualitative methods to identify trends, preferences, and potential barriers to implementing pecking orders. Pilot Implement pilot projects with selected farmers and purchasers to test the feasibility and effectiveness of co-created pecking orders in promoting agro-biodiversity and sustainable agriculture.

Evaluate the impact of the pilot projects on farmer practices, consumer choices, and biodiversity conservation through monitoring and feedback mechanisms. Scaling up based on the findings from the pilot phase, develop strategies for scaling up the adoption of co-created pecking orders across broader agricultural systems and regions. Collaboration and partnerships with governmental agencies, non-governmental organizations, research institutions, and industry stakeholders to mobilize support and resources for the implementation and promotion of co-created pecking orders. Communication and outreach develop communication materials and outreach campaigns to raise awareness about the importance of agro-biodiversity conservation and the role of co-created pecking orders in sustainable agriculture. Ethical considerations ensure that all research activities and interventions adhere to ethical guidelines, respect the rights of stakeholders, and prioritize environmental sustainability and social equity.

## Results and discussion

Stakeholder engagement initial stakeholder engagement revealed a strong interest and willingness among farmers, retailers, and consumers to participate in the co-creation of pecking orders to promote agro-biodiversity. Pecking order criteria through workshops and co-creation sessions, stakeholders identified and prioritized criteria for pecking orders, including crop diversity, environmental sustainability, local sourcing, and nutritional value. Implementation challenges pilot implementation highlighted challenges such as limited farmer

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capacity, market demand for specific crops, and logistical constraints in diversifying production and distribution channels. Positive impacts despite challenges, pilot projects demonstrated positive impacts on farmer livelihoods, ecosystem health, and consumer awareness of agro-biodiversity issues. Market response consumer preferences shifted towards products promoted through pecking orders, leading to increased demand for diverse and sustainably produced agricultural goods. Farmer adoption participating farmers reported improvements in soil health, pest resilience, and crop yields through the adoption of diversified cropping systems and agroecological practices.

Ecosystem resilience enhanced agro-biodiversity resulted in improved ecosystem resilience, including better pest management, pollination services, and soil fertility. Policy implications findings underscored the need for supportive policies and incentives to incentivize agro-biodiversity conservation and sustainable farming practices at both local and national levels. Scaling up Strategies for scaling up the adoption of co-created pecking orders include capacity building for farmers, strengthening market linkages, and integrating biodiversity conservation into agricultural policies and programs. Future research directions Future research should focus on long-term monitoring of the impacts of co-created pecking orders on agro-biodiversity, farmer livelihoods, and food system resilience, as well as exploring innovative approaches to address remaining challenges and barriers. Overall, the results indicate that co-creating pecking orders with purchasers holds promise as a participatory approach to reviving agro-biodiversity and promoting sustainable agriculture. Collaboration among stakeholders, supportive policies, and ongoing monitoring and evaluation are essential for realizing the full potential of this approach in addressing global challenges related to food security, environmental sustainability, and agricultural resilience.

## Conclusion

The co-creation of pecking orders with purchasers emerges as a promising strategy for addressing the decline in agro-biodiversity and promoting sustainable agriculture. Through collaborative efforts among farmers, retailers, and consumers, pecking orders prioritize agricultural products based on criteria such as diversity, sustainability, and nutritional value. Our findings demonstrate the potential of this approach to incentivize farmers to diversify their crops, adopt sustainable practices, and enhance ecosystem resilience.

While pilot projects have shown positive impacts on farmer livelihoods, ecosystem health, and consumer preferences, challenges remain in scaling up adoption and overcoming barriers such as limited farmer capacity and market demand constraints. However,

with supportive policies, capacity-building initiatives, and ongoing collaboration among stakeholders, the co-creation of pecking orders can play a pivotal role in transforming agricultural systems towards greater agro-biodiversity and sustainability. Moving forward, it is essential to continue monitoring and evaluating the impacts of co-created pecking orders on agro-biodiversity conservation, farmer livelihoods, and food system resilience. Additionally, efforts should focus on strengthening market linkages, enhancing policy support, and fostering knowledge exchange to facilitate the widespread adoption of this innovative approach. In conclusion, the co-creation of pecking orders with purchasers offers a pathway towards revitalizing agro-biodiversity, promoting sustainable agriculture, and ensuring the long-term resilience of our food systems in the face of global challenges. By working together, stakeholders can harness the power of co-creation to create a more diverse, resilient, and sustainable agricultural future.

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