

Transforming food systems with agroecology: possible pathway and interactions for integrating sustainable mechanization

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Outline

- ▶ Introduction
- ▶ Current research
- ▶ Pathway for integration
- ▶ Possible interactions
- ▶ Conclusion

Introduction

▶ **Sustainable Agricultural Mechanisation (SAM):**

the application of tools, equipment, or machines in the agricultural production process – ideally, in a manner that is socially, culturally, economically, and environmentally friendly



Introduction

Impact of SAM

- ▶ Increase land productivity by facilitating timeliness and quality of cultivation
- ▶ Prevent the impact of labour shortages
- ▶ Decrease the environmental footprint of agriculture when combined with adequate conservation agriculture practices
- ▶ Improve people's livelihoods and achieve food security while reducing inequalities (social, income, employment etc.)

Introduction

Stages in the attaining full SAM



Power Substitution



Mechanization of the Human Control Functions

Adaptation of the Cropping System to the Machine



Adaptation of the Farming System and Production Environment to Facilitate Mechanization

Automation of Agricultural Production

Current Research



- ▶ **Scope**
 - ▶ Rice production in Ghana
 - ▶ Sustaining Conservation Agriculture practice in rice production
 - ▶ Smallholder farmers produce most of the rice consumed locally

- ▶ **Research Idea**
 - ▶ Investigate factors influencing smallholder farmers' access and use of farm machinery within the scope of the African Food Systems

Current Research

- ▶ Project focus
 - ▶ Understand the role of gender norms on machinery access, control and ownership
 - ▶ Understand the effect of machinery use on productivity and household income



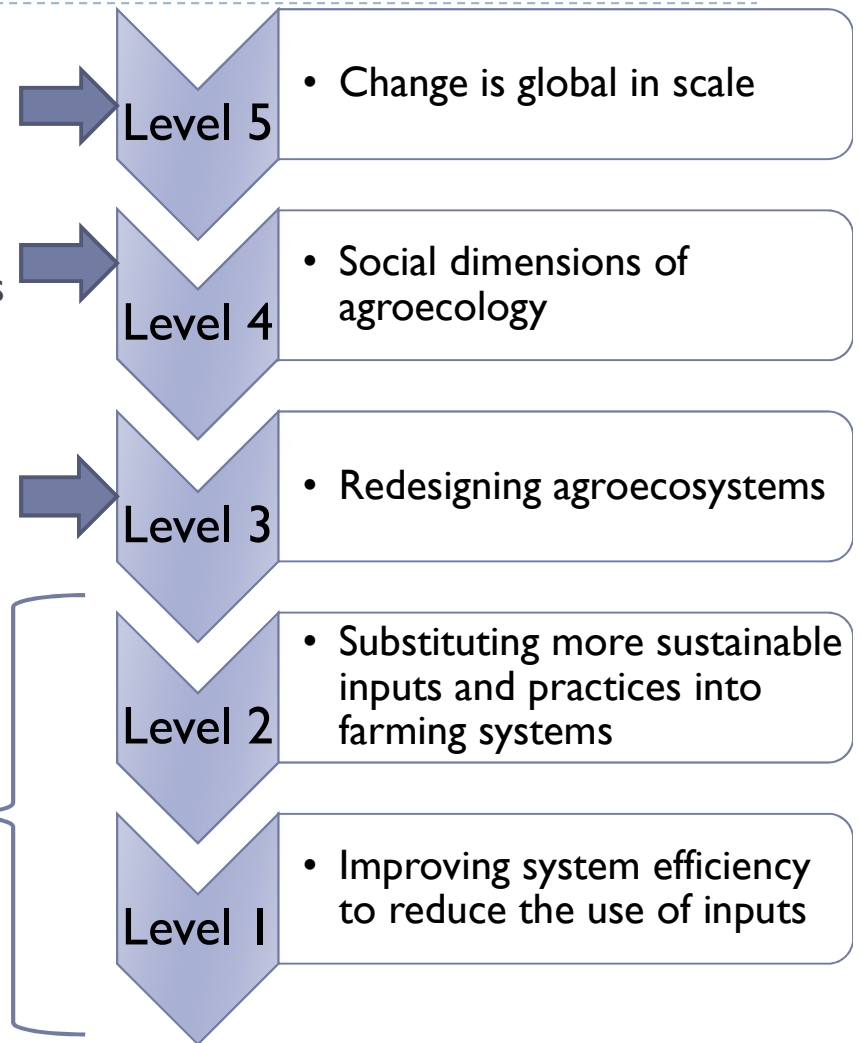
Current Research

Outcomes

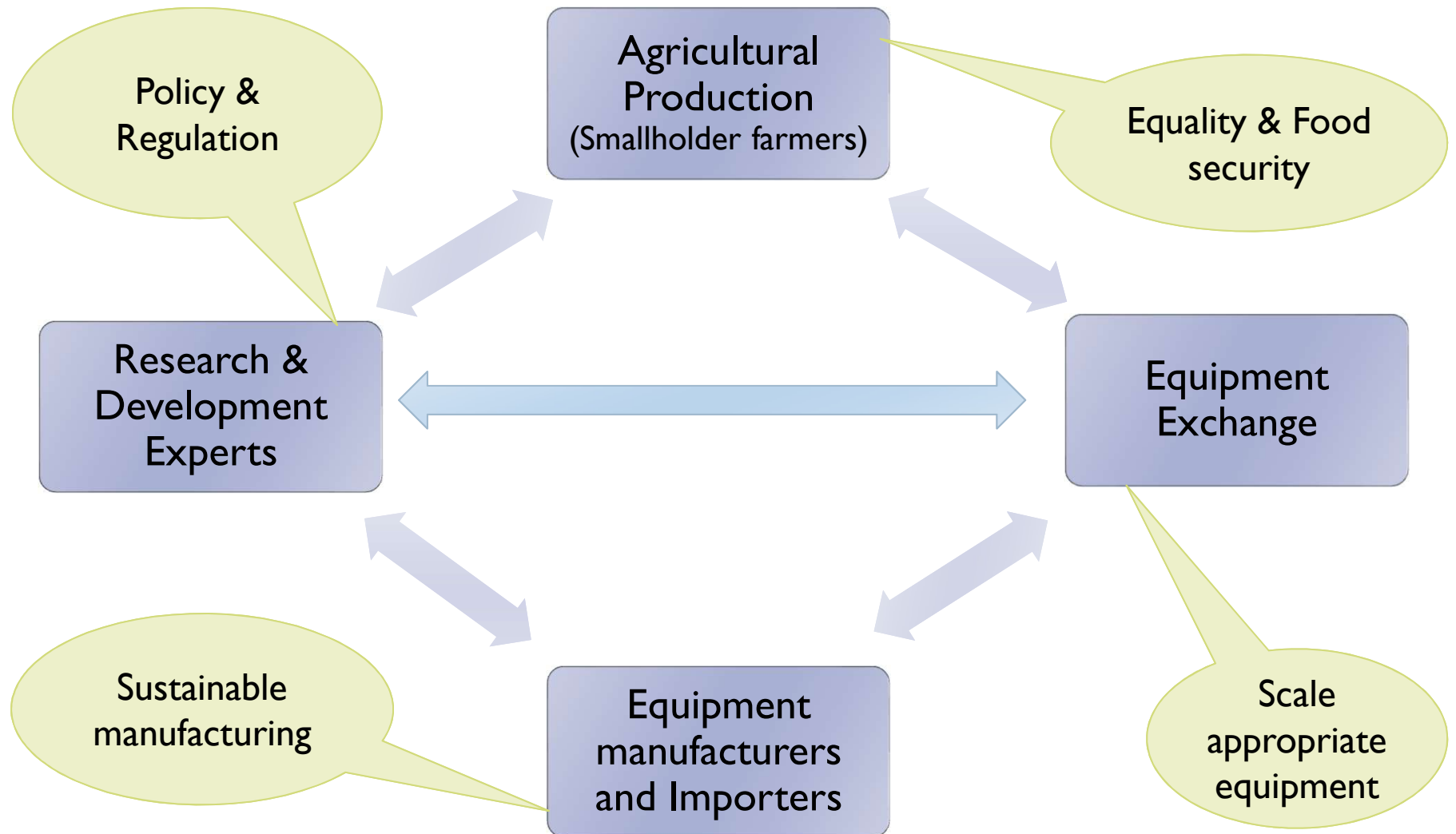
- ▶ Provide **gender transformative** policy guidelines that will influence machinery ownership
- ▶ Policy directions on effective **Conservation Agriculture Mechanization** in Ghana
- ▶ Framework to support machinery provision and utilization by smallholder farmers to promote **Conservation Agriculture practice** (reduce drudgery)

Pathway for integrating SAM into Agroecology

- ▶ Improve people's livelihoods and achieve food security while reducing inequalities (social, income, employment etc.)
- ▶ Provide **gender transformative** policy guidelines that will influence machinery ownership
- ▶ Policy directions on effective **Conservation Agriculture Mechanization** in Ghana
- ▶ Framework to support machinery provision and utilization by smallholder farmers to promote **Conservation Agriculture practice** (reduce drudgery)



Possible interactions for effective SAM in Agroecology



Conclusion

- ▶ Sustainable mechanisation integration into agroecology is needed.
- ▶ Using Gliessman's levels of transformation of the food systems with agroecology:
 - ▶ Sustainable mechanisation intervention activities targeted at levels 1-3 should be informed by aspirations from level 4-5
 - ▶ Global change can be promoted through adequate incentives and interaction between stakeholders



THANK YOU

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