Tackling Mali's seed value chain(s) by using value modeling.

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Problem context

- SDG 2: zero hunger by 2030 for the entire world
- 256 million people are undernourished in Africa
- 60% of sub-Saharan Africa works in agriculture
- Seed value chain is of large importance



Mali as a country



Problem definition: Mali's seed value chains



(a)

Problem 1

- There **is** knowledge at a macro-level
 - Lack of information
 - Lack of communication channels
 - Drought insecurity
 - Cultural resistance
- The more detailed micro-level knowledge **is limited** and **unstructured**

Problem 2

- Malian government is indecisive on dealing with the two systems
- (Inter)national political bias for improved seeds
- Officially, the traditional system is not illegal, but also not recognized
- Intellectual property rights on seeds might pose human rights issues

Researsch questions and methods

Research question 1 (Design science)

What are the differences between the commercial and traditional Malian seed system, seen from a value chain perspective?

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Research question 2 (Qualitative study)

How can E3-value contribute to gaining insights into a seed/food value chain in a low resource environment?



Two seed systems: characteristics and context

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Traditional unimproved seeds	Improved seeds
Locally selected	Genetically improved
No fertilizers & pesticides	Need fertilizers & pesticides
No certification needed	Needs certification
More environmentally adaptive	Less environmentally adaptive
Better for biodiversity	Pesticides kill insects
Better for soil quality	Demanding for soil quality
Part of village heritage	Part of organizations
Not officially recognized	Officially recognized
Mainly own consumption	Mainly for trade
No state interference	State driven before 1970
No state interference	Today both private and public
Only planted once	/ Planted multiple times
	Seeds→R1→ R2→R3→Food

(a)

Pictures of field visits



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E3 – value crash course

E3-value is a visual modeling language that is build to analyse value networks



E3-value model of improved seeds

- 1. Basic seeds are offered by Icrisat to Cooperatives
- 2. Cooperatives spread the seeds to their farmers
- 3. Farmers sell the seeds directly to small customers or to their cooperative
- 4. Cooperative certifies the seeds
- 5. Cooperatives also sell directly to small customers, or to their union
- 6. Union sells to small (15%), medium (30%) and large customers (55%)
- Value transfers of organizational representation
- Radio broadcasting



E3-value model of traditional unimproved seeds

- Farmers have three ways of obtaining seeds:
 - Via the commercial seed market (gate the other model) (7%-10%)
 - NGO
 - Traded/gifted between and among communities



Results for research question 1

What are the differences between the commercial and traditional Malian seed system, seen from a value chain perspective?



Large difference in formality

- Improved seeds model is relatively clear
- Traditional model is still a black box



The differences in planting process

 Because the improved seeds have to be planted several times, they are probably more suitable for transportation and preservation.



A way of living vs. A business model

- Traditional model is based on trade and survival
- Improved model has investments, risk and bureaucracy



Results for research question 2

How can E3-value contribute to gaining insights into a seed/food value chain in a l



Get to know the unknown

- For example, finding out who sells the seeds
- E3-value offers knowledge structuring



E3-value as a conversation starter

- Visuality helps to verify info with research population
- Standard simpler version



(a)

Values with a story

- Quantifying them model helps to analyse feasibility
- Values can tell a story in itself



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Conclusions & Discussion



- The (inter)national political bias towards the improved seeds model also goes for (scientific) knowledge
 - Is it really so arbitrary?
 - Are there many variations?
- E3-value language is very suitable for mapping the food chain in a low resource environment
 - A standard simplified version would be nice
- Research limitations led to not fully quantifying the E3-value model
- This research formalized knowledge and proposed new methods to solving the puzzle of how Mali should handle their two different seed systems.