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Value Chain Laboratory: Alternative Impact Assessment methods of value chain development

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Introduction

To alleviate poverty, fostering of inclusive value chains is considered a promising approach. This approach requires alternative impact assessment tools to measure behavioral change in vertically structured value chain relationships. This explorative study takes place in the context of the 2SCALE program implemented by the International Fertilizer Development Center (IFDC).

Background

2SCALE aims to improve rural livelihoods in 9 African countries. 2SCALE provides support to supply chain agents through training, certification, information exchange and market positioning. The assessment of changes in the relationships between supply chain agents is considered fundamental for market transformations.

Objective

The Value Chain Lab (VC-Lab) has been developed as an alternative assessment tool. The VC-Lab has been tested to evaluate 2SCALE, a development program among the sorghum value chain in Kenya. A participative gaming approach was used that enables to identify changes in mutual trust and risk attitude and an agent based model was developed. The agent-based model mirrors simulation games with actual value chain participants and provides future prognoses on developments and potential impacts of development programs.

Concepts

Figure 1 outlines the 3 key elements that influence the relationships between value chain agents, namely: (i) risk, (ii) mutual trust and (iii) transaction cost. These three aspects are of importance to support coordination between agents and to enhance adoption of Good Agricultural Practices and Good Business Practices finally leading to improved welfare and sustainability.

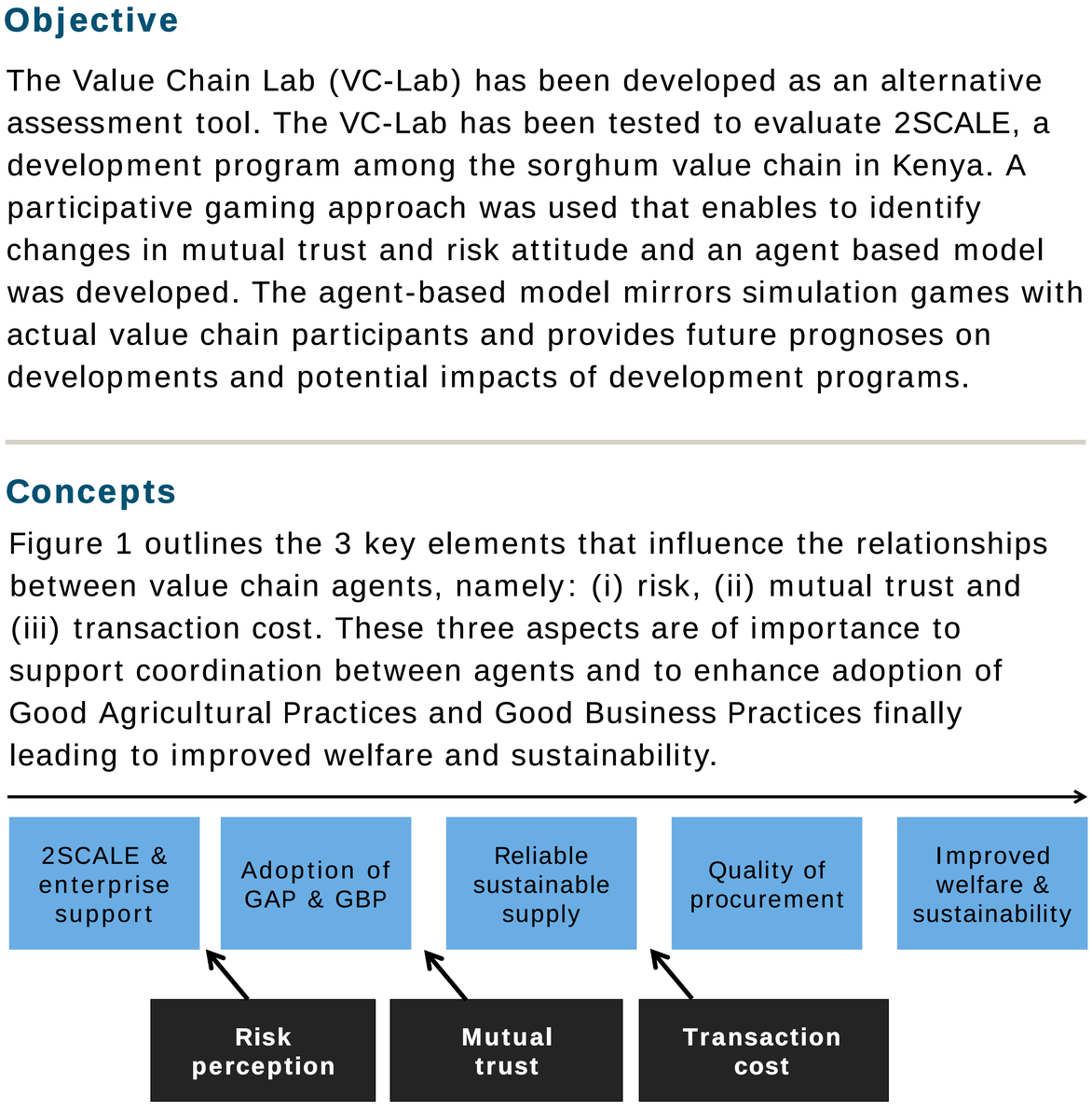

Figure 1 Agency behaviour and value chain interactions

Methods

The VC-Lab consists of 3 tools: Value Chain Analysis (VCA), Value Chain Games (VCG) and a multi-agent Simulation Model.

1. Value chain mapping & analysis of sorghum;
2. Games measuring risk attitude, (mutual) trust & collective action;
3. Agent-based simulation testing hypotheses.

Main results on methodology

- The VC games provided accurate and important data on behavioural aspects of value chain actors and their interrelations:
  - Games enable a good measurement of change in trust levels among producers, between producers and other VC actors and in collective action;
  - Games enable a good measurement of risk attitude;
  - Transaction costs cannot be measured with the games.
- The games provided crucial parameters for agent based modelling if conducted over time and with counterfactual.
- The agent based model provided good simulations of trust and risk.
- For simulating intervention impacts more data is needed.
- More data on transaction costs over time is needed.

Main results on intervention

	Trust	Risk	TC
Games	++	++	
Agent based model	+	+	+

Table 1 Results on trust, risk and transaction costs . ++ high increase, + increase,

Conclusion & discussion

The VC-Lab is a promising method in measuring behavioral and relational changes, to simulate decision making of value chain actors and potential impact of VC development interventions. However further development is required.

Related to VC games:

- No computerized game possible in these contexts;
- High costs of psychical presence and real life game setting;
- Simulation needed of behavior of VC actors other than producer;
- No anonymity, so possible socially desired behavior;
- No data over time complicating parameters for the model;
- Comparison group is too small or absent.

Related to the agent based model:

- Highly depending on the data collected during games;
- Not all necessary parameters and data for modelling available via literature and desk study, implicating high costs.

References

- Youri Dijkxhoorn, Ruben Oldenhof, Christine Plaisier, Koen van Wagenberg, Jos Verstegen and Tim Verwaart (forthcoming) Simulating trust in supply chain: supporting market transformation. Wageningen Economic Research
- Tim Verwaart, Youri Dijkxhoorn, Christine Plaisier and Coen van Wagenberg (2016) Simulating the role of trust and supply development. 12th Artificial Economics Conference AE2016, Rome, 21-22 September 2016

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