Moritz Egger[1], **Michael Curran**[1], **Lina Tennhardt**[1,2] **and Christian Schader**[1]
[1] Research Institute for Organic Agriculture (FiBL), Switzerland; 2 Université Catholique de Louvain
Contact: michael.curran@fibl.org | +41 62 865 04 30 | www.fibl.org

A multi-attribute model of smallholder resilience:

Assessing cocoa farmers' capacities to withstand socio-economic shocks caused by the COVID-19 pandemic in Ecuador and Uganda

1) Introduction

- Concept of **socio-economic resilience** gained relevance since COVID-19 disrupted global food supply chains.
- Cacao is an important cash crop in developing countries, was heavily impacted by the pandemic[1].
- Clear need exists to create resilient farms, yet lack of consensus on how resilience is operationalized[2].

2) Objectives

1. Review actor-orientated resilience concepts to apply to agricultural producers in the South.
2. Develop and validate a multi-attribute, indicator-based model for cacao farm resilience.

Figure 2. Graphical representation of sampled farmers.

3) Methods

Methodology steps shown in **Figure 1**, consisting**:**

- Literature review and resilience framework choice.
- Indicators of **"general resilience"** (i.e. not linked to a shock) collected before pandemic.
- Data on **"specified resilience"** (i.e. Covid-19 impacts/responses) collected during pandemic.
- Validation by comparing general resilience performance and outcomes during the pandemic (expect positive correlation).

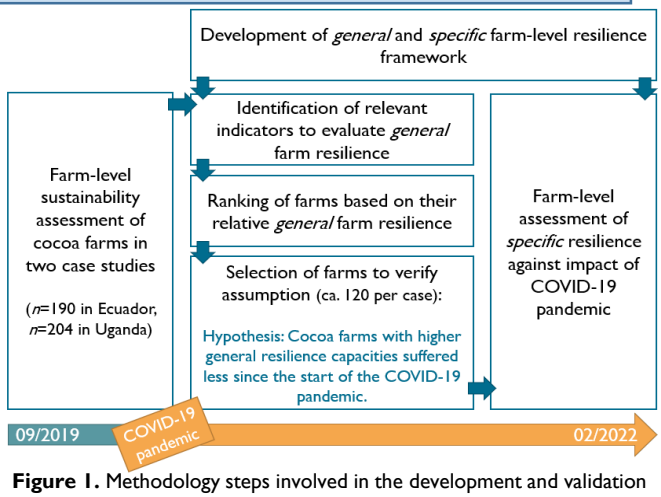
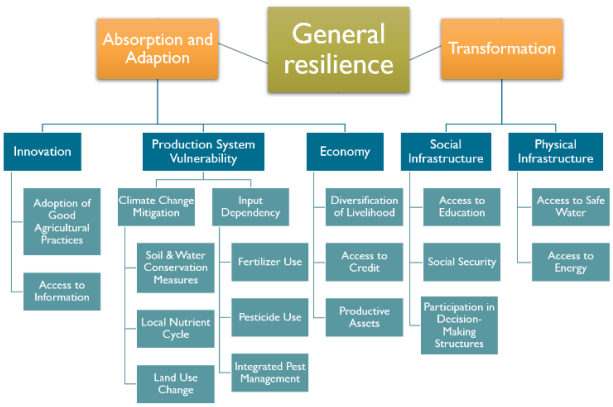


Figure 1. Methodology steps involved in the development and validation of the resilience multi-attribute indicator-based model

4) Results

- 394 farmers sampled in Uganda and Ecuador before Covid (**Figure 2**) using the SMART-Farm Tool.
- Relevant indicators arranged in multi-criteria resilience framework[3] (**Figure 3**).
- Criteria aggregated under three main capacities: short-term "Absorption", medium-term "Adaption" and long-term "Transformation".
- Indicator aggregation using DEXi decision-support system and expert-derived weights[4].

Figure 3. Multi-criteria framework for general resilience.



5) Outlook and conclusions

- Indicator weighting and aggregation ongoing with experts (Delphi method).
- Validation data (on Covid impacts) currently being collected in the field.
- Rare example of a resilience model validated against real-world data.

References

1. Teye, J. K., & Nikoi, E. (2021). The Political Economy of the Cocoa Value Chain in Ghana. https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/16676.
2. Meuwissen, M. P., et al. (2019). A framework to assess the resilience of farming systems. Agricultural Systems, 176, 102656.
3. Serfilippi, E., & Ramnath, G. (2018b). Resilience measurement and conceptual frameworks: a review of the literature. Annals of Public and Cooperative Economics, 89(4), 645–664.
4. Bohanec, M. (2020). DEXi: A Program for Multi-Attribute Decision Making (Version 5.05) [Computer software]. https://kt.ijs.si/MarkoBohanec/dexi.html