

I. Glossary, Methodology and Research Questions

Adaptation and mitigation potential: farmers effectiveness to realize adaptation and mitigation opportunities, in terms of qualitative and quantitative improvements (IPCC,2014).

Resilience: the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation (IPCC,2014).

Questions:

1. How are the adaptation and mitigation capacity and resilience of a farm linked to the indicator *Farming intensity*?
2. Are the main adaptation and mitigation strategies *small-scale-proof*?

Qualitative study via **documental analysis and literature review**. Through a **systematic approach**, reviewing documents provided by peer-review

II. Problematization

Agriculture create pressure on the environment and depletion of natural resources

Worlds calories intake rising. At the same time, 820 million people were still undernourished in 2018 (FAO 2019)

In 2010, some 900 million of the estimated 1.2 billion extremely poor lived in rural areas

About 750 million of them worked in agriculture, usually as smallholder family farmers (Olinto et al., 2013).

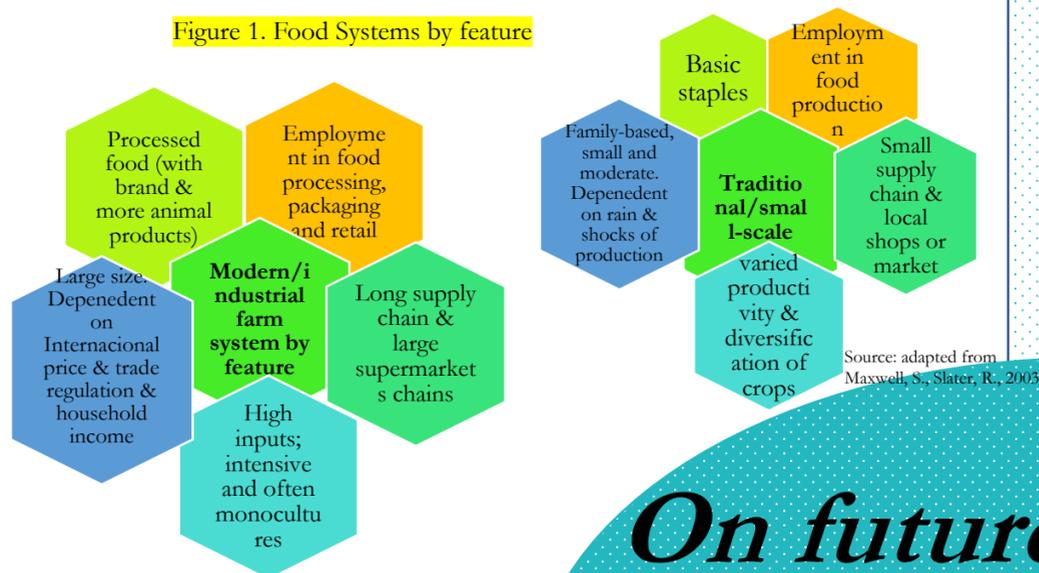
Without considering small-scale production: Impossibilities in attaining sustainable development in all the dimensions (social, economic and environmental)

III. Research Steps, Concepts and Framework

Research Steps:

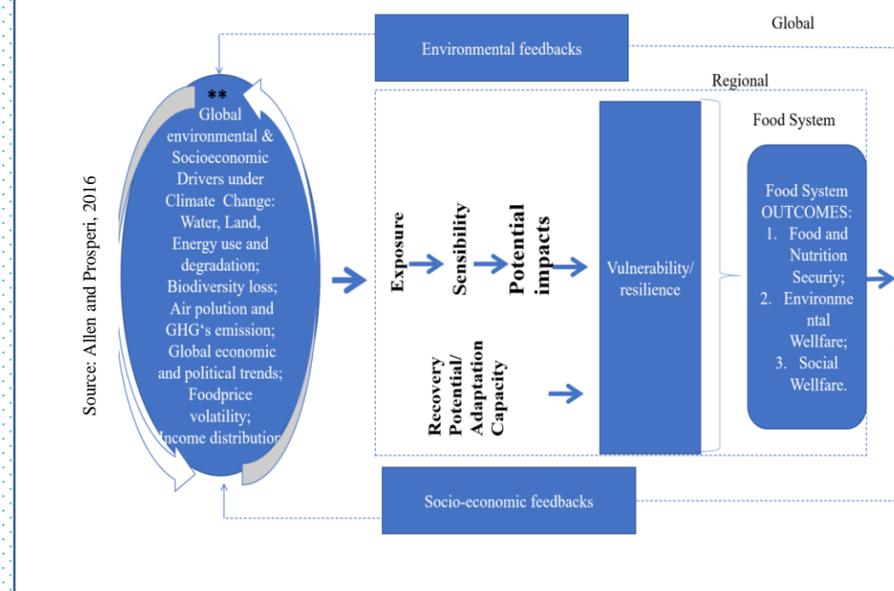
- Map food-systems types (Figure 1) and conceptualize the socio-ecological framework (Figure 2);
- Tabulate the existing practices and measures and relate it to adaptation and mitigation potential;
- Through a Complex System Dynamics perspective, assess (un)sustainable adaptation and mitigation measures and relates it to the total resilience of a given type of farming: small-scale vs agri-industry.

Figure 1. Food Systems by feature



Source: adapted from Maxwell, S., Slater, R., 2003

Figure 2. Socio-ecological framework:



On futures of food Assessing the Adaptation and mitigation potential of diverse agricultural pathways- The small-scale farming vs agroindustry

VI. Conclusions

IV. Main Mitigation and Adaptation strategies found in the sectors

A) Livestock:

Most of the adaptation and mitigation measures related to livestock production require a high farming intensity; demands more land-change, energy and water uses to produce feed additives.

Eventually, this practices are not linear, nonetheless they are very expensive and can have unintended consequences, as emitting more Co2, in practices as storage cover with straw and natural or induced crust.

Limitations, in the gaze of small-scale farming, were found mainly in terms of access to capital, knowledge, investment and education.

Are the mitigation and adaptation strategies of the livestock sector increasing the resilience of the small-scale farmer? **No, they require the monopolization of land and intensification of agriculture, possible only trough subsidies or direct financing, trough microcredits.**

B) Cereals and Horticulture

Higher Potential: sequestration and reduction of emission and less unintended/unknown consequences.

In this case, the adaptation potential are multiple and have only few limitations for the small-scale farmer. Some of these include high costs, for example in organic certification, lack of R&D, poor storage facilities.

Bigger increase in resilience, by increase of the adaptive capacity or by reduction of exposure and sensitivity.

Furthermore, a co-benefit of many of this measures is to guarantee the food-system agent much more autonomy and control over the inputs necessary for production (except for no-till farming, when it involves pesticide

Transition towards circular economy in the food system would be facilitated through giving priority to the needs of the small-scale farmer, evidencing the need to incorporate these agents' struggles and realities into the future research and political agenda.

This is not only justified by the big potential to mitigate and adapt to climate change by small-scale farmers.

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