CS5- Role of policy framework and social cohesion for sustainable value chains and livehoods in Ghana

MATS Deliverable 3.3

MATS
making agricultural trade sustainable

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Introduction

The MATS project aims to expand and enhance the available knowledge on the relationships between agricultural markets, trade, investments, policy, environmental sustainability, human well-being, and hence the SDGs. It intends to set a new benchmark in agricultural trade policy analysis to deliver novel solutions for the necessary sustainability transition. The EU Green Deal, as an example of a policy programme that aims at improving sustainability, represents both a challenge and an opportunity for agrifood imports for all countries, in differentiated ways. To turn this opportunity into reality the improvement of the design, governance, and implementation of trade policies and regimes are required all the way from private sector to national, EU, African and global levels.

As the core part of the MATS project, an integrated modelling framework was developed and applied to seven case studies. The impact of unsustainable practices, as well as the multidimensional gains emerging from improved sustainability have been identified and quantified. The results provide guidance for assessing the impact of sustainable agricultural trade policy at local, national, regional and global level, across a range of social, economic and environmental indicators.

CS5 – Poultry (Ghana)[1]

The issue analysed is the sustainability of poultry production in Ghana. The methodology used for the creation of the Causal Loop Diagram (CLD) is called Systems Thinking (see Text Box 1). A CLD is a graphical representation of variables and their interconnections, giving shape to the dynamics of a given system (see Text Box 2).

The CLD is presented in Figure 1, and was created by Technical University of Madrid through a participatory approach with stakeholders from the poultry sector in Ghana, and in close collaboration with CSIR-STEPRI.

The Conceptual Model of the Poultry System in Ghana shows a dynamic system that connects various elements and dimensions influencing the sustainability and competitiveness of the poultry farming sector. This model reflects how different elements and dimensions interrelate within the industry, forming reinforcing loops that amplify trends and balancing loops that mitigate them.

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[1] https://sustainable-agri-trade.eu/role-of-policy-frameworks-and-social-cohesion-for-sustainable-value-chains-and-livelihoods-in-ghana/

At the core of the model are the strategic investments in quality inputs and improved farming practices which lead to increased performance rates thus enhancing profitability, represented by the Reinvestment – Farm Performance Reinforcement Loop (R1). In turn, this profitability is used as a start for further investment into poultry farming supporting continuous improvement within the sector. Moreover, investing in better farm practices improves compliance with quality standards, resulting in better prices and increased profitability, as shown in R2. This reinforces farmers' ability to reinvest in poultry farming. Farmers' investing capacity, represented by R1 and R2, is also reinforced when accessing to appropriate processing, storage, and retail facilities, which allows farmers to comply with quality standards and obtain better prices for their products, further improving profitability (as shown in R3). Farmers with higher reinvestment capacity are more likely to increase the flock size in their farms, which will give them better access to loans to invest in improving farm performance and products quality through better access to services, and facilities, reinforcing competitiveness of their products and thus the domestic poultry sector (R5). As a result, farmers' profitability is enhanced and thus their reinvestment capacity will stimulate increasing their flock size (R6). Besides, if farmers adopt better management practices, they have better access to low-interest loans, which reinforces their adoption of good practices and technologies, including management practices (R7). Improving management practices at the farm level puts farmers in better conditions to access loans, that will allow them to continue improving their practices.

Along with the improvements in poultry farming profitability resulting from the dynamics above, the competitiveness of domestic poultry meat is also enhanced. This more competitive domestic poultry sector can positively impact farmer's access to tailored knowledge and technology transfer services, reinforcing competitiveness (R4).

On the other hand, investing in the adoption of better practices and technologies leads to an increase in costs associated with improved husbandry practices, housing facilities, and equipment at the farm, as well as those related to processing, storage, and retail facilities. These costs balance the profitability of poultry farming and, therefore, the farmers' capacity to reinvest (B1). Moreover, a more competitive domestic poultry sector drives tailored knowledge and technology transfer services and improves the enforcement of regulations that support the sector. These two conditions help farmers to adopt better practices and technologies, which leads to an increase in costs that balance the competitiveness of the domestic poultry meat (B2).

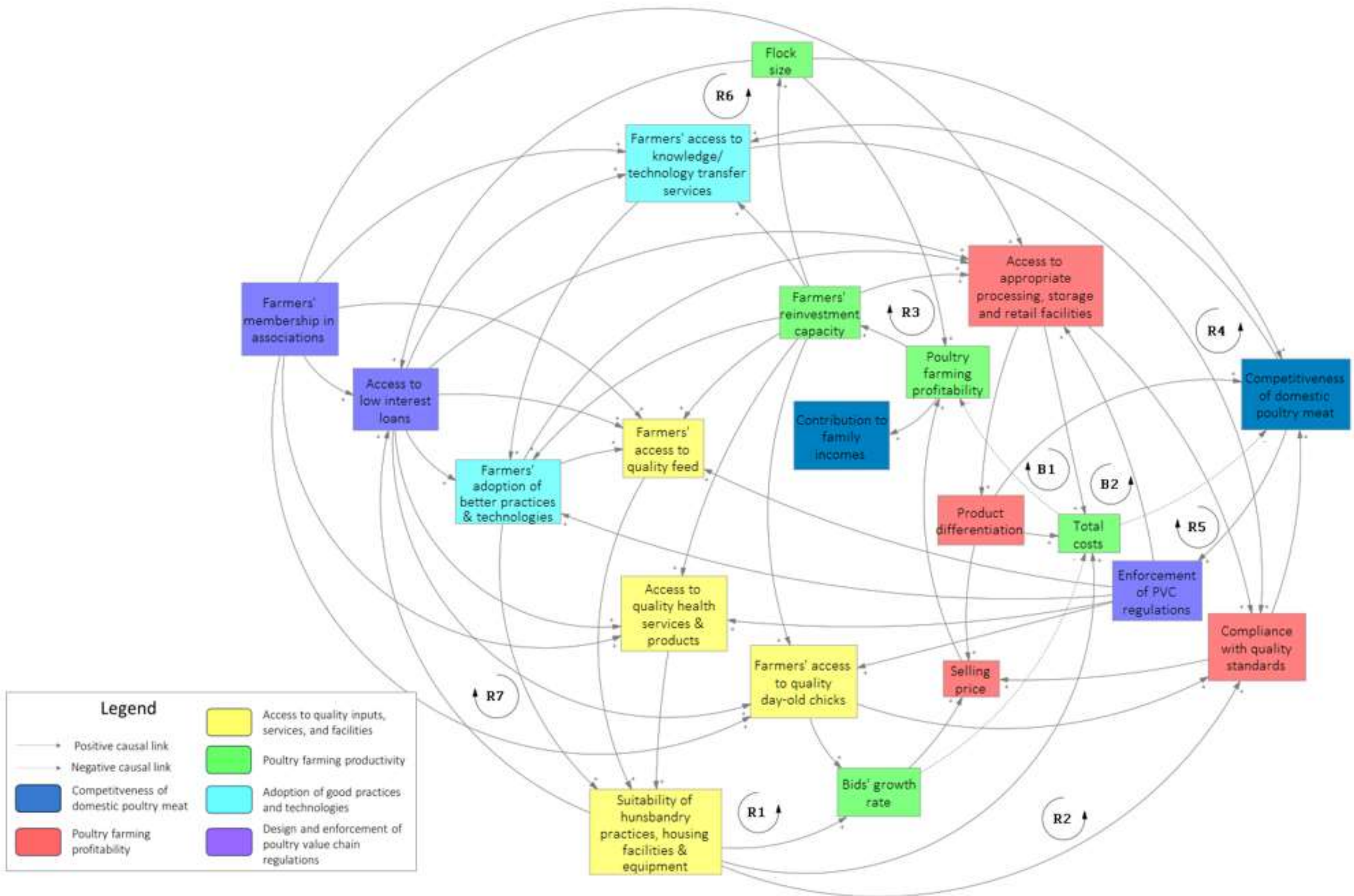

Figure 1: CLD for the dynamics influencing poultry production in Ghana

Text box 1: Introduction to Systems Thinking

Systems Thinking (ST) is an approach that allows us to better understand and forecast the outcomes of our decisions, across sectors, economic actors, over time and in space (Probst & Bassi, 2014). It emphasizes the system, being made of several interconnected parts, rather than focusing on its individual parts.

With ST being an approach, there are several methodologies and tools that support its implementation and hence the identification of the underlying functioning mechanisms of a system and their quantification and evolution over time. In general terms, it can be said that the identification of the components of a system and of the relationships existing among these components (e.g. carried out through the use of Causal Loop Diagrams) represents (i) the *soft* side of Systems Theory. Instead, attempts to quantify these linkages and forecast how their strength might change over time (e.g. carried out using System Dynamics models) represent (ii) the *hard* side of the field.

Concerning the former (i), Causal Loop Diagrams (CLD) allow to create a shared understanding of how the system works, and hence identify effective entry points for (human) intervention, such as public policies. When this is done using a participatory approach, it helps to bring people together, creating the required building blocks for the co-creation of a shared and effective theory of change.

On the latter (ii), System Dynamic models allow to quantify policy outcomes across social, economic and environmental indicators (UNEP, 2014) providing insights on the relative strength of various drivers of change (scenario analysis) and supporting the identification and prioritization of policy intervention (policy analysis). These models can be bottom up or top down (Probst & Bassi, 2014).

In the context of this research, the role of ST is to assess the extent to which the main drivers of change considered (i.e. ageing of population, technological change and fiscal sustainability) can shape future trends, affect existing policy effectiveness and require future interventions. This in turn allows to identify a system's safe operating space and limits, anticipating the emergence of side effects, across social, economic and environmental indicators.

Text box 2: Causal Loop Diagrams (CLD)

A causal loop diagram (CLD) is a map of the system analysed, or, better, a way to explore and represent the interconnections between the key indicators in the analysed sector or system (Probst & Bassi, 2014). As indicated by John Sterman, “*A causal diagram consists of variables connected by arrows denoting the causal influences among the variables. The important feedback loops are also identified in the diagram. Variables are related by causal links, shown by arrows. Link polarities describe the structure of the system. They do not describe the behavior of the variables. That is, they describe what would happen if there were a change. They do not describe what actually happens. Rather, it tells you what would happen if the variable were to change.*” (Sterman, 2000)

As indicated by Sterman, CLDs include variables and arrows (called causal links), with the latter linking the variables together with a sign (either + or −) on each link, indicating a positive or negative causal relation (see Table 1). A causal link from variable A to variable B is positive if a change in A produces a change in B in the same direction. A causal link from variable A to variable B is negative if a change in A produces a change in B in the opposite direction. Circular causal relations between variables form causal, or feedback, loops. There are two types of feedback loops: reinforcing and balancing. The former can be found when an intervention in the system triggers other changes that amplify the effect of that intervention, thus reinforcing it (Forrester, 2002). The latter, balancing loops, tend towards a goal or equilibrium, balancing the forces in the system (Forrester, 2002).

By highlighting the drivers and impacts of the issue to be addressed and by mapping the causal relationships between the key indicators, CLDs support the identification of policy outcomes using a systemic approach (Probst & Bassi, 2014). CLDs can be in fact be used to create storylines corresponding to the implementation of policy interventions, by highlighting direct, indirect and induced policy outcomes across social, economic and environmental indicators.

Variable A	Variable B	Sign
↑	↑	+
↓	↓	+
↑	↓	-
↓	↑	-

Table 1. Causal relations and polarity

References

Forrester, J. (2002). *Road Maps: A guide to learning System Dynamics.* Camebridge: Systen Dynamics Group, Sloan School of Management, MIT.

Probst, G., & Bassi, A. (2014). *Tackling Complexity: A systematic approach for decision makers.* Sheffield, UK: Greenleaf Publishing.

Sterman, J. D. (2000). *Business Dynamics - Systems Thinking and Modeling for a complex world.* Irwin McGraw-Hill.

UNEP. (2014). *Using Models for Green Economy Policymaking.*