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INTERACTIONS BETWEEN AGRICULTURAL VALUE CHAINS AT LOCAL LEVEL: A METABOLIC APPROACH

Myriam Grillot^a, Sophie Madelrieux^a, Julie Fleuet^b, Jean-François Ruault^a, Pauline Marty^b, Philippe Lescoat^c^a UGA, Irtsea (France)^b UTT (France)^c AgroParisTech (France)

Abstract: Main resource for human and animal nutrition, agricultural biomass has also high potential uses as substitute for non-renewable resources in other sectors (construction, chemistry, energy, etc.). It plays an important role towards the energetic transition. In that regard, public institutions, particularly at local level, highly support new biomass uses for food and non-food uses, for products (e.g. grains, livestock) and co-products (e.g. straw, manure), leading to value chain reorganizations and/or creations. To prevent from de-structuring the other existing value chains, or from escaping local energetic, environmental or socio-economic issues, it seems important to understand the interactions between value chains in place. For that aim, the framework of metabolism seems particularly relevant. It allows an analysis of the flows of materials and energy occurring between nature and society, between different societies, and within societies. Interactions between value chains can be characterized by material flows and an analysis of actors which produce or use agricultural products and co-products. However, due to value chain specialties, the complexity of actor networks and highly diverse localities, these evaluations are difficult to undertake at local scales.

Our goal here is to present and discuss an approach to account for interaction within and between agricultural value chains, based on a representation of material metabolism coupled with an analysis of actors' networks. First, we build a theoretical metabolism, based on public databases to: i) inform on potential agricultural products and coproducts, ii) gather general information on local actors. Second, we lead a survey to consolidate this metabolism from the actual flows and develop a reading grid of actors' networks based on the forms of: i) circulation of material flows between actors; ii) organization and coordination of this circulation of material flows between actors; iii) synergies, dependencies and competitions between actors around these material flows. The main challenge is to structure these interactions in a global representation of the local agricultural metabolism.

We show an application of the method on two French localities that are contrasted in terms of agriculture in: i) the North of the Aube department, an area specialized in large field crops; ii) the Vallée de la Drôme, farm fields are four times smaller and the agriculture is more diversified with different types of crops and livestock systems.

This method can be used with local partners as a reflexive tool on agriculture and value chains and as a starting point for foresight studies.