Analysis of alignment and coordination strategies for crop diversification - Research Summary

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Objective and focus of the study

The purpose of this research was to highlight the critical aspects of alignment and coordination of strategies and processes along value chains, related to the diversification of crop systems. The research was rolled out as a complementary study in the continuation the European project DiverIMPACTS[1]. The methods for this study included a systematic review of scientific literature on intra-value chains coordination in the context of crop diversification. This review allowed to identify barriers to coordination, and related levers to enhance the alignment and coordination of processes related to crop diversification. Those levers are discussed according to the type of value chains. Secondly, a framework was developed to render systematic and consistent the characterization of crop diversification value chains. This framework is meant to enable a more targeted analysis of case studies and provides a foundation for cross-case comparisons and the identification of broader trends or patterns. By organizing similar value chains into clusters, future projects can effectively target specific dimensions or variables for further study, thereby enhancing the depth and breadth of research in crop diversification contexts. Levers could then be better targeted according to various variables of crop diversification farming systems and value chains.

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[1] DiverIMPACTS is a multi-actor European project run in 2017-2022 that brought together scientists, farmers, farmers' organizations, and associations from eleven European countries to jointly promote agricultural diversification (https://www.diverimpacts.net/). At the core of this project were twenty-five concrete innovation case studies. Within the framework of Work Package 5 (WP5 – Barriers to innovation and reorganization of supply chains), the focus specifically was on the diversity of agricultural production methods and value chains, in the context of diversifying cropping systems.

Key results

Result #1. Twenty-two barriers to coordination are identified across crop diversification value chains.

Table 1 - Summary of the barriers to coordination along the value chain discussed in the literature.

Number	Type	Barriers
1	Organizational	Duration of contracts not enough to secure farmers in taking risks and investing
2	Organizational	Uni-lateral and one-sided contract terms
3	Organizational	Lack of production contracts that could facilitate the exchange of information (knowledge, technical, references)
4	Organizational	Finding suitable contracts to address issues related to variability in production (Flexibility, sharing risks and reducing control costs)
5	Organizational	No ensured or limited volumes to buy/sell products or establish secure contracts
6	Organizational	No ensured quality of products to be bought, sold or to establish secure contracts
7	Disabling environment	Limitation or absence of clear legal institutional frameworks for contract establishment
9	Organizational	No ensured fair sharing of added value between actors
10	Organizational	No ensured reciprocal benefits in partnership (especially land arrangements)
11	Organizational	Limited or no cooperation between innovative farmers
12	Organizational	Lack of communication between value chain actors
13	Organizational	Difference of vision, goals and priorities among value chain actors
14	Organizational, Knowledge related	Unbalanced power in bargaining between farmers and traders and information asymmetry between value chain actors
15	Organizational	Conflicting interest (ex. Negotiation of prices, quantity, quality and timing)
16	Financial	Lack of monetary incentives
17	Financial/Market-related	High transaction costs (transportation and logistics) driven by spot market
18	Market related	Uncertainties regarding future demand for CD products
19	Market related	Competition in an undifferentiated market
20	Market-related, Disabling environment	Lack of standards and labels
21	Disabling environment	Overly regulated and constrained value chain
22	Cultural	Lack of trust

Sources: see bibliography in the full report.

Result #2. Identification of coordination levers and relevance according to how value chains are being coordinated.

Table 2 - Linking coordination levers across the different modes of coordination based on Revoyron (2022). Relevance of the use of these levers in the various value chains.

Type of mechanism	Coordination levers	Coordination lead			
		By market	By downstream actors	Between farmers and downstream actors	By farmers
Organizational	Formal contractual arrangements	NA	✓	✓	✓
Organizational	Multi-annual contracts	NA	✓	✓	✓
Organizational	Multilateral contracts	NA	✓	✓	✓
Organizational	Production contracts	NA	✓	✓	NA
Organizational	Quality standards renegotiation	NA	✓	✓	✓
Organizational	Promote collaboration and sharing dynamics and vision	NA	✓	✓	✓
Organizational	Encouraging all the value chain actors to the participation in the decision-making processes	NA	NA	✓	NA
Knowledge-related/ Organizational	Sharing knowledge, references and technical specifications on crop management to farmers	NA	✓(aval)	✓(agri.)	✓
Knowledge-related/ Organizational	Creating platforms for exchanging information and best practices	✓	✓	✓	✓
Knowledge-related/ Technical	Providing additional equipment and/or technical specifications on crop management	✓	✓	✓	✓
Market-related	Communicate to the consumer the value of public goods contained within private goods	✓	✓	✓	✓
Market-related	Enhancing marketing strategy toward differentiation for products from crop diversification.	✓	✓	✓	NA
Market-related	Certification	✓	✓	✓	✓
Market-related	Eco-labelisation	✓	✓	✓	✓

Type of mechanism	Coordination levers	Coordination lead			
		By market	**By downstream actors**	**Between farmers and downstream actors**	**By farmers**
Market-related	Provision of information regarding the sustainability attributes to the consumers	<u>✓</u>	✓	✓	✓
Market-related /Organizational	Creating short and local value chains to ensure an outlet for CDP	X	X	X	**<u>✓</u>**
Financial	Subsidies to allow experimentation with new arrangements	NA	**<u>✓</u>**	✓	✓
Financial	Incentiving farmers to help them adopting more CD systems	✓	**<u>✓</u>**	✓	✓
Financial	Creating financing mechanisms to help farmers cover the costs of transitioning to more CD systems	✓	**<u>✓</u>**	✓	✓
Disabling environment	Improving the regulatory framework to better support crop diversification	✓	**<u>✓</u>**	✓	✓
Disabling environment	Establishing a legal framework to allow experimentation with new arrangements	?	**<u>✓</u>**	✓	✓

Notes: ✓- Indicates that the lever might be relevant for the value chains characterized by the specified coordination lead for which it is checked. This means that the lever can play a role in this value chain type; ✗ Indicates that the lever is not relevant for the value chain characterized by the specified coordination lead for which it is checked. This means that this lever might not have a role in this value chain type; **"?" -** Indicates that the relevance of the lever for the value chain characterized by the specified coordination lead is undetermined, and we are uncertain about it, requiring consultation with experts; **NA:** Indicates that the lever is not applicable due to the definition of the coordination lead type, meaning it's not a matter of relevance, but rather that it cannot be used. Signs in black represent associations based on the work of Revoyron (2022). Signs in bold and underlined represent the most relevant levers for each coordination mode, according to workshop expert consultation.

Sources: see bibliography in the full report.

Result #3. A framework for characterizing crop diversification value chains

In the framework of the DiverIMPACTS project, typologies[2] emerge as a crucial tool for understanding the diversity of socio-technical-economic contexts within which agricultural systems operate. Barriers to crop diversification exhibit non-uniform patterns, varying across these contexts and extending beyond individual farms to impact the entire value chain, interdependently and may be linked to a systemic lock-in phenomena (Meynard et al., 2013a; Revoyron et al., 2022b; Vanloqueren and Baret, 2009).

By reviewing and comparing the different typologies that have emerged out of DiverIMPACTS' research work, we intended to enhance clarity regarding the coherence and complementarity among these typologies. The work of reviewing and aggregating those typologies through a systematic approach and expanding data through additional bilateral interviews with case study leaders and experts, has led to a framework of variables that are relevant for the characterization of crop diversification systems, including the farm level, value chain dynamics, and the interaction between those two dimensions. Each of those variables may take several possible values, and relate to various stages and levels of food systems, which allows to cover a wide diversity of crop diversification systems.

This framework is a tool that can be used to characterize, classify, differentiate, between crop diversification contexts. The framework can serve for actors (including projects managers, policy makers, researchers, etc.) to design simplified typologies that fit with their purpose. This holistic perspective enables a more targeted analysis within individual case studies and also provides a foundation for cross-case comparisons and the identification of broader trends or patterns. By organizing similar value chains into clusters, future projects can effectively target specific dimensions or variables for further study, thereby enhancing the depth and breadth of research in crop diversification contexts.

References

The detailed report of this research is available on demand. Please contact Clémentine Antier or Antoine Messéan.

Full report reference: *Analysis of alignment and coordination strategies for crop diversification : Supplementary research following the DiverIMPACTS project.* Hind Dib, Clémentine Antier, and Philippe Baret, 2024. Sytra, UCLouvain.

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[2] A typology refers to the systematic classification or categorization of entities based on shared characteristics or attributes. This classification enables the grouping of similar elements or recurring configurations according to specific criteria, thereby facilitating the analysis and understanding of structures, dynamics, and interactions within the systems under study. A typology has to demonstrate maximal heterogeneity among its types, while achieving maximum homogeneity within each specific type or category (Madry et al., 2013). A typology provides a conceptual framework for researchers, economists, professional and governmental stakeholders as an analytical tool for studying dynamics and behaviors in agriculture. It should enable the examination of the impact of implemented or projected measures both at the global and regional levels (Brossier and Petit, 1977).

Table 3 – Overview of the variables used within crop diversification typologies developed in the context of DiverIMPACTS.

Variable classification	ID	Variables	Authors	Evaluation of the quality of the variable
Production level	A.1	**Type of diversification** (Temporal, spatial, with intercropping)	Morel et al. (2020)	Approved
	A.2	**Type of agriculture** (Conventional, only organic)	Morel et al. (2020)	Approved
	A.3	**Diversification trajectory types** (T1, T2, T3) Surface area Number of crops Development rate	Revoyron (2022)	Depends on scope of research
	A.4	**Industrial pathways** (Pathway I1, I2, I3, I4) Acreage Ownership of downstream facilities	Antier et al. (2019)	Approved*
Governance	B.1	**Value chain size** (Short-circuit, chain with at least one intermediary)	Revoyron (2022)	A third value could be added (chains with many intermediaries?) Aggregation and coherence need adjustment in relation to variable C1 from Morel et al. 2020.
	B.2	**Value chain approach** (Low, Medium, High)	Riera et al. (2022)	Depends on scope of research
	B.3	**Stage of development of the value chains** set-up enhancing further developing	Villa (2022)	Approved
	B.4	**Adoption of fair governance mechanisms** (Low, Medium, High)	Riera et al. (2022)	Approved
	B.5	**Coordination lead** by the market by downstream actors co-constructed between farmers and downstream actors short supply chains lead by the farmers between the farmers	Revoyron (2022)	Approved Excluded value: "coordination between the farmers" to specifically focus on coordination among value chain actors.
	B.6	**Organisational model** (Model 1, Model 2) Innovation lead Governance	Antier et al. (2022)	Approved
	B.7	**Consumers engagement** (Low, Medium, High)	Riera et al. (2022)	Depends on scope of research
Scope of marketing	C.1	**Value chain target** o local market o commodity market o arrangement with livestock farmers	Morel et al. (2020)	Approved