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## Introduction

A good functioning European food system is key to deliver food and nutrition security for all Europeans. Currently, that system faces many economic, environmental and social challenges as well as opportunities following socio-economic and technological developments. However, these are not equally distributed throughout the EU. Hence, future policies toward healthy and resilient systems need to acknowledge and consider this diversity. Moreover, knowledge of that diversity is currently limited and dispersed. In particular some sectors, regions and specific driving forces are not well studied and cross-linkages among them have been insufficiently analysed. The purpose of SUFISA is to enlarge this knowledge base by identifying sustainable practices and policies in the agricultural and fish sectors able to support the sustainability of primary producers in a context of multi-dimensional policy requirements, market uncertainties and globalisation.

To do so, the heterogeneity of conditions and strategies developed by European producers was analysed by qualitative and quantitative analysis of cases studied in WP2. The large array of case-studies, both in terms of sectoral and regional dimensions, gave us a good overview of the types and prevalence of conditions and the subsequent strategies developed at producer and system level. In total, 22 case-studies were analysed, covering 11 countries and 7 sectors. Next, the impact of market imperfections and policy requirements on the efficiency and performance of primary producers was analysed in WP3. Finally, four future scenarios were developed and the resulting effects on market imperfections were analysed with stakeholders in WP4.

We found that cases and sectors are characterised by a large range of conditions and subsequent strategies and performances. Still, systematic observations emerged. First, market conditions are more important than regulatory and policy conditions in affecting and shaping the farming and fishing systems. Second, the historical and political context, in particular the level of government intervention, both at the level of the country and the sector, shape producers' discourses, concerns and expectations. This translates into a higher difficulty to adapt to new market structures and supply chain arrangements. Third, increasing productivity through intensification and upscaling remain the two dominant future strategies, leaving little room to more sustainable or innovative farming activities and marketing strategies. Fourth, we also observe a sequential list of strategies across countries whereby producers would first be rather non-organised, then willing to cooperate within producer organisations and then better coordinate within more elaborated organisational forms such as clubs of producers or vertical coordination.

We now aim at integrating those results in the current document to confront the conceptual and theoretical views with the observations from case studies, in order to deliver relevant policy implications that would answer to caveats raised in the SUFISA project concerning the prevalence of market imperfections and the ability of producers to develop strategies to deal with them.

## 1. The Conditions-Strategies-Performances Approach

### 1.1 Introduction

The conceptual framework is based on the *Structure-Conduct-Performance* (SCP) approach of sectors developed in the industrial organisation and management literature. The SCP approach builds on the interlinkages between market structure, firms' strategic behaviour and the profitability and sustainability of a specific sector (Porter, 1981; Rastoin and Gherzi, 2010). Within this paradigm, *structure* is identified by the presence of relatively stable economic and technical conditions of an industry that constitute the context in which competition occurs (Bain, 1972; Porter, 1981), whereas *conduct* or *strategy* represents the application of choices on parameters such as price, quality, business size, marketing, research & development, contracts etc. *Strategies* lead to a number of *performances* that involve profitability, technical efficiency for cost minimisation, innovation, employment, and sustainability over time (Porter, 1981; Rastoin and Gherzi, 2010).

Choosing this approach is driven by SUFISA's objective, i.e., understanding producers' decision-making processes and abilities to adapt to new sustainability requirements. The adaptation of the SCP approach to SUFISA is summarised in Figure 1 and should be understood in the following way. The central element is the decision-maker at the producer level. This actor reacts to the internal and external conditions according to his own characteristics. Internal conditions are composed of characteristics of the production unit (farm or fishing vessel) and the household the producer belongs to. The range of internal characteristics of the producer is very broad and encompasses, among others, his capabilities, attitudes, beliefs, social and human capital, values and preferences. In other words, the producer is not reduced to its 'economic agent' facet that takes decisions based on economic signals only, but also social and cultural aspects may influence the decision-making process. External conditions are the external context constraining the producer's decision making. The way the producer integrates internal and external conditions is translated into chosen strategies. The process leads then to performances, seen as a result of the strategies and of the continuous effect of evolving conditions. The observation of the induced performances might incentivize the producer to recalibrate his reactions to conditions or his internal conditions (e.g., training, quantity of seasonal labour, labels, etc). The producer can also influence external conditions, although his capacity to do so is generally quite limited.

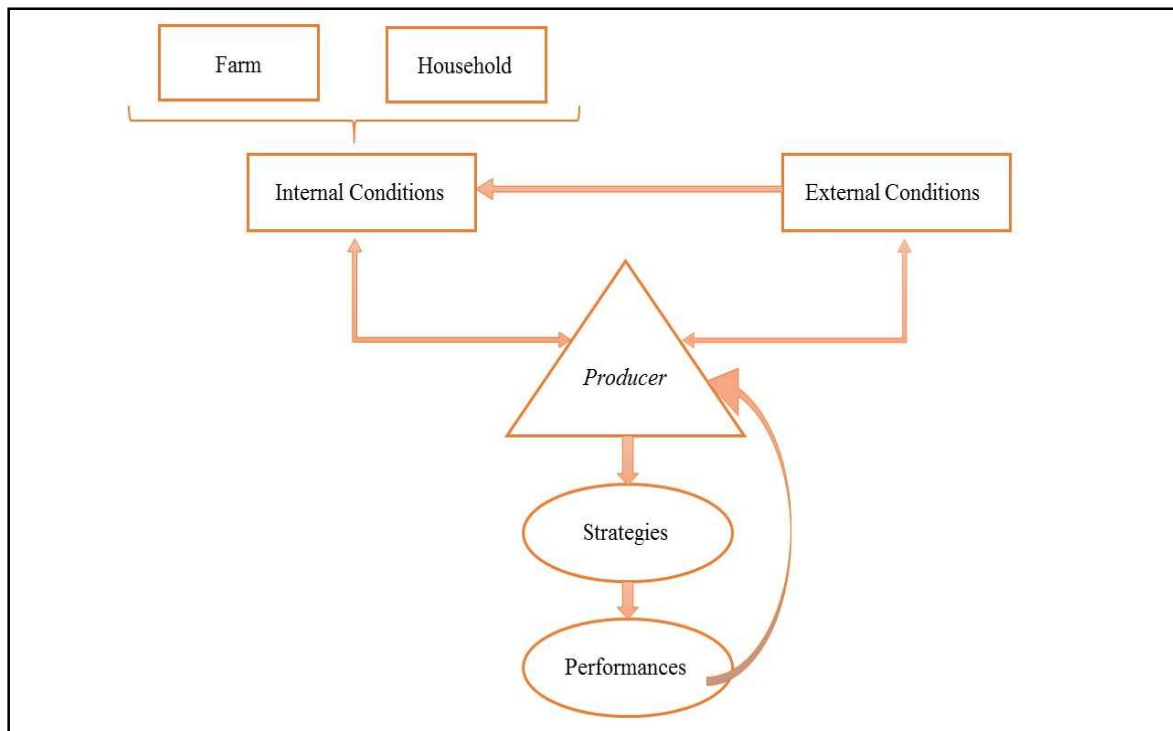


Figure 1: Producer's decision making process

## 1.2 Internal conditions

### 1.2.1 Introduction

Before analysing internal conditions in detail, it is worth underlining that not only do we not mean to confine the analysis to a reductionist representation of the production unit as the sum of its components, neither do we consider internal elements to be isolated in an "external" environment. Such a reductionist representation would have been contested at least from two perspectives (Noe and Alrøe, 2012; 2015). First, the growing involvement of external actors into farm and fishing operations and in decision making processes is recognised. This blurs the borders of the production unit and increases system complexity. Second, there is an increasing awareness of the limits of a representation in which elements are defined *per se*, in favour of a relational approach where actors can only be defined (and their role understood) within a certain relational pattern.

The way we consider internal conditions is similar to the Agricultural Household Model (AHM, Singh and Subramanian, 1986; Taylor and Adelman, 2003) which emphasizes how family farming strategies are not only aimed at business-related objectives, but at a more complex range of objectives, including family welfare. The AHM builds on the assumption that production and consumption decisions cannot be seen separately when they are attributed to the same entity (Taylor and Adelman, 2003) and that family farm business outcomes have to be assessed in relation to household welfare. This dynamic interaction gains higher relevance as an increasing differentiation of family farms into business and family life occurs. This results in the gradual decoupling of farming activities from the life of the farming

household and a reduced attention paid to the perspective of generational succession (Noe and Alrøe, 2015, p.140). More specifically the farm land is not only considered as a space and an asset for production, but also as a guarantee for credit access and an asset to be transmitted to the heirs (Marks-Bielska, 2013). The explicit consideration of this "household-focused" dimension is particularly relevant when an effective strategy in business terms reduces household wellbeing, leading to a "maladaptation" to changing conditions that negatively influences quality of life, while also eroding the household's capacity to adapt to further changes in the long term (Criddle, 2012; Coulthard and Britten, 2015). Note that the importance of the household's characteristics in the process of decision-making may vary according to the context and the size of the farm, and also applies to fishermen households.

### 1.2.2 Description

First, the *production unit* represents all the assets, resources and organisational aspects of the farm or fishermen's business. The traditional elements are assets such as buildings, land<sup>1</sup> and machinery (or vessels) (the so-called 'capital'). Labour characteristics are also part of the traditional variables internal to the production unit. Working capital and investment characteristics such as short-run and long-run credit opportunities, the level of debt and sunk costs are also part of internal conditions that could shape strategies. Core business characteristics and in particular, scale should also be considered. Long-term characteristics of the production unit that explains its logistical, organisational and reputational aspects will also receive particular attention in the way they can lead to a specific set of strategies. An important element to be considered, given the scope of the SUFISA project, is the path dependency of the production unit which influences the firm's capability to design and to implement new potential strategies. Hence, lock-in effects can also reside in the firm itself given the existence of sunk costs as well as technological and organisational constraining effects influencing the degree of path-dependency of the firm and its ability to adapt to new challenges.

Second, the *household* element accounts for the elements that influence the decision making process through a sense of belonging. This second element includes, among others, household values, interests and wellbeing, resource allocation and wealth (as suggested by the AHM). Gender composition of the household is also relevant. Entrepreneurship, fishing and farming are stereotypically seen as a male domain (Ahl, 2006, Campbell and Bell, 2000, Driga et al., 2009) and rural areas tend to be characterised by unequal power relations and uneven access to resources between men and women (Charatsari, 2015). Brandth (2002) identifies the 'discourse of the family farm', in which family farms are seen as owned and controlled by men, passing on from father to son. Women often enter farming only through marriage and are not perceived (neither perceive themselves) as farm owners, but only as farmers' wives (mothers, daughters, widows) and assistants (Brandth, 2002). The tasks women are often confined to, on the basis of their traditional gender attributes tend to bound them within the private borders of the household, yet sometimes their caretaker role is extended to the community. Yet, from a multifunctional perspective, women's presence facilitates the implementation of extra-farming activities (e.g., agri-tourism, food processing, kindergardens). However, the patriarchal character of

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<sup>1</sup> Here special attention will be given to the importance of land holding status.

traditional family farms has been challenged in recent decades (O'Hara, 1998), and farming women have been negotiating their positions to become active business agents. Besides, with the decline of core business incomes, women's extra-farming work has gradually become more relevant for the household budget, yet this does not necessarily lead to a change of status within the household (Bock, 2006). Gender roles have also been studied among small-scale fishing entrepreneurs, in relation to the effects of an economic crisis on the relations between husbands and wives (Gerrard, 1995) and to civic and political engagement of women and men (Gerrard, 2000).

### 1.3 External conditions

#### 1.3.1 Introduction

External conditions are the set of elements that cannot be shaped or substantially affected by the producer but that influence his strategies (as far as they are perceived by the decision-makers) and performances. It is worth mentioning that the distinction between internal and external conditions is not always straightforward. The criterion we follow is based on the degree to which a condition can be shaped by producers' decisions. Yet, in some cases the identification is neither sharp nor stable in time and requires a deeper analysis of the specific contingencies. Yet, as for internal conditions, it is from the interaction between producers' characteristics and external conditions that decision-making processes are undertaken, objectives are set and then strategies designed and implemented.

To structure external conditions affecting the producer, we rely on an adapted version of a model developed by Porter (1990) that describes the relevant elements to competitiveness.

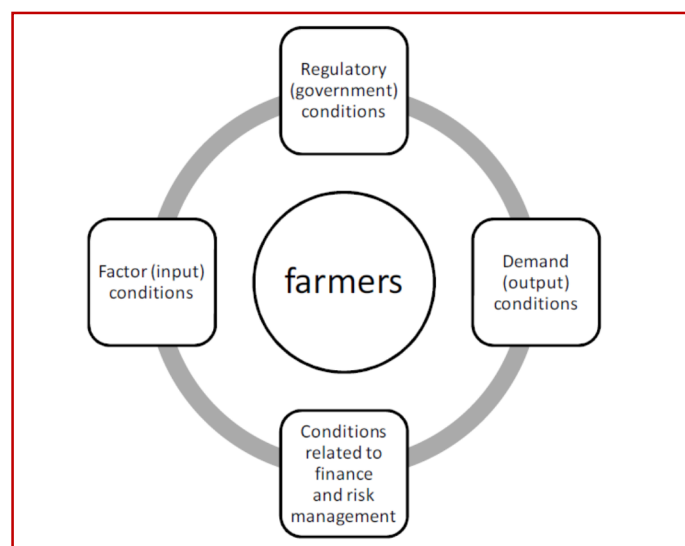


Figure 2: Multidimensional framework guiding SUFISA, inspired by Michael Porter (1990)

Our objective here is to further adapt the framework provided in Figure 2 in such a way that it meets the theoretical needs of the SUFISA project. To do so, the four rotating elements of the scheme are adapted and completed with four additional elements, i.e., socio-demographics, technology, socio-institutions and ecology. Hence, conditions are grouped into eight categories, in accordance with the literature (Figure 3).

Note that elements in Figure 3 vary in the politico-geographical level at which they are defined. Some conditions are mainly or exclusively relevant to the local level, others act at a national or even global scale. Yet, a univocal label can rarely be applied to each condition in this regard. Figure 3 contains a tentative identification of the most pertinent level for each condition: local/regional, national, EU or global level. Note that the higher the level, the lowest the ability of the producers to influence it.

Finally conditions change over time, and this is what producers care about. This because it relaxes a constraint or because it requires adaptation. They represent shocks or stressors the producer has to face, as well as new opportunities. These changes can be rather unpredictable or not, and the resulting producer's capacity to adapt and resist to them. When changes in the conditions are particularly intense and unexpected, they may result in a 'trauma' or 'traumatogenic change' (Alexander, 2004; Sztompka, 2004), which leads to a disorganization of the actor's representation of the world and to a consequent psychological and/ or cultural disorientation.

These considerations lead to reconsidering the scheme in dynamic terms. Following Porter's description of his diamond as a dynamic system (Porter, 1991) it is possible to consider Figure 3 in terms of a set of mutually influencing conditions, in which one determinant depends on the state of others, and changes in some conditions influence others. For example, mobile factors (skilled workforce, specialised services) may tend to concentrate in certain areas where regulation, policies and infrastructures look promising. This can create a cumulative effect of agglomeration which, in turn, may lead to negative effects like cost increases and displacement of local actors. Farms' strategies and performances themselves, far from being confined within the farm box borders, are also crucial elements of this dynamic vision. In economic terms, this means that relations between conditions themselves are endogenous to each other making producer strategies the output of general equilibrium instead of partial ones.

Figure 3 shows a broad, yet not exhaustive, lists of external conditions and their mutual influence on producers' decisions. It is worth reminding that external conditions influence producers also through their effects on internal conditions, as shown in Figure 1.



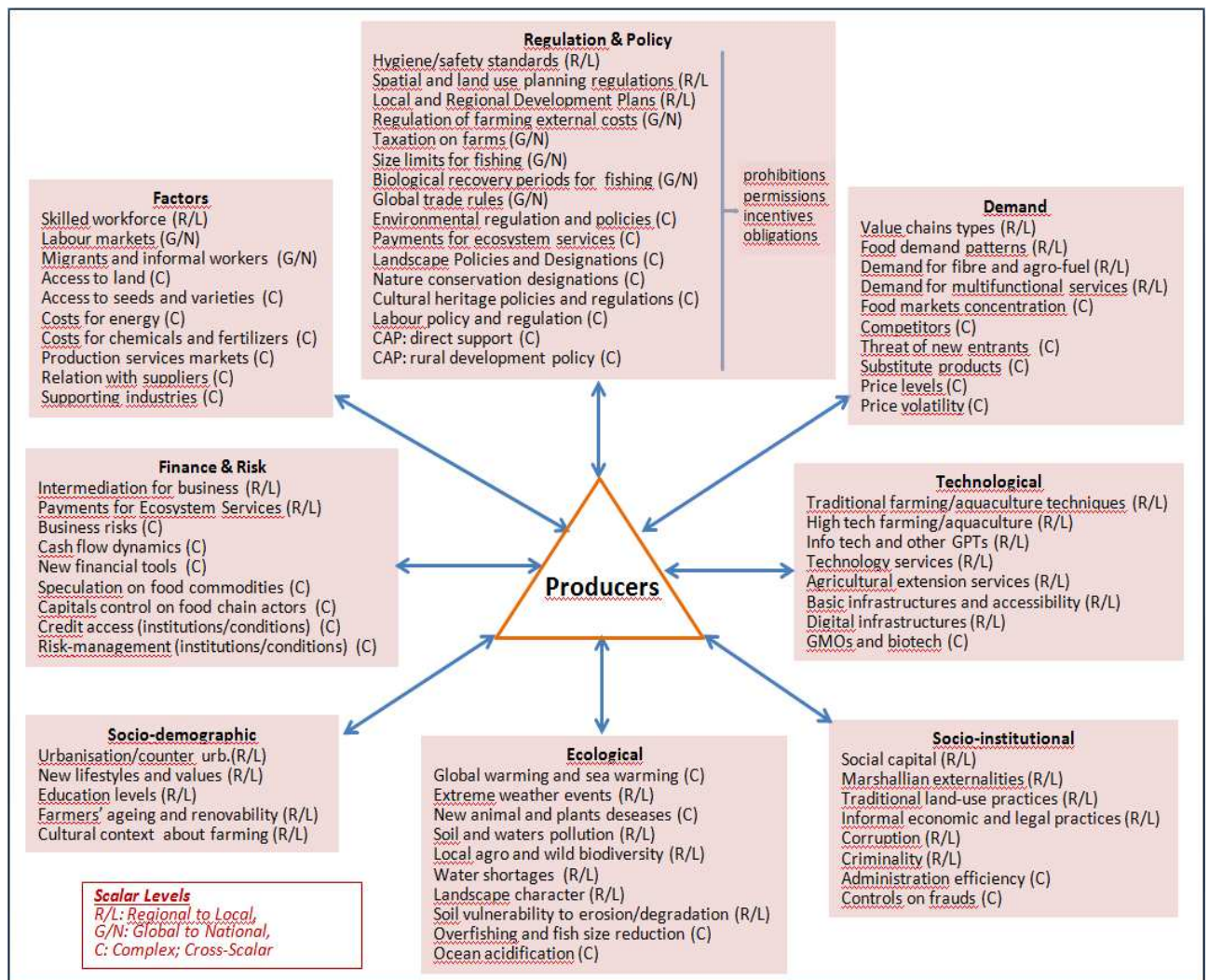


Figure 3: External conditions

### 1.3.2 Description

The **Factors** box regards the conditions under which the producer can manage, that is, acquire, trade, lend, hire or use the factors and assets required for his activities. Hence, this category describes the external conditions imposed to the factors used within the firm itself. In particular, the availability of these factors at the local/regional level is a key feature of the firm's business environment.

The **Demand** box represents the conditions influencing the demand for the goods and services the producer could produce or deliver. We refer first of all to the demand patterns for food, feed, fiber and biofuel. We also take into account the increasing demand for multifunctional and ecosystem services, that plays a fundamental role for producer survival in many contexts, and that have been investigated by authors addressing post-productionism (Wilson, 2008) and rural development (Ploeg et al., 2000).

**Regulation & Policy** relates to the set of regulations, laws and other instruments that governments use to deliver efficient resources allocation and increase the welfare of citizens, when the context is not incentive compatible. These regulations influence and at times determine the scope of producer actions. More concretely these take the form of rules, standards, quotas, property rights, taxes but also subsidies and financial support.

**Finance and risk** encompasses conditions of the financial and insurance markets. These are key markets given producers' needs for capital investment but also their high exposure to risk, and in particular to natural disasters. Moreover, derivatives potentially provide to investors the opportunity to better manage general or specific risks.

**Technology** is certainly a major issue to discuss in relation to changing business environment and producer development trajectories. Technological conditions refer here to the changing and continuously evolving array of breeds, cultivars, technological devices and methods that are potentially available to producers.

**Socio-institutional** factors account for social elements embedded in formal and informal institutions that strongly influence producers' strategies and opportunities. Key features include public administration efficiency, social capital (also in terms of networks and attitudes to cooperation), network externalities, and the presence of corruption and criminality as well as the effectiveness of related controls.

**Socio-demographic** factors encompass the demographic and social evolutions of society. This affects producers directly by shaping the population of producers and of successors. It also indirectly drives demand conditions because of evolving life-styles or composition of the population.

The **ecological context** is the ecological and metabolic processes primary production relies upon. The ecological context can also be read in terms of opportunities for the producer to develop new/greener production methods and to deliver ecosystem services (Swinton et al., 2007), thus transitioning towards a multifunctional perspective (Ploeg et al., 2000).

Finally, it is important to stress here the unequal relationship that exists between internal and external conditions. While external conditions strongly influence internal conditions, the reverse is less clear. Indeed, due to small size, producers can hardly influence external conditions. Yet, it must be acknowledged that production units tend to be more and more concentrated and hence bigger, converting them into potential active actors able to shape sides of the agricultural and fisheries policy spheres.

### *1.3.3 External conditions and market imperfections*

When taking decisions producers evolve within a complex world of transactions. Indeed, the simple fact of selling their production involves an array of deviations from what neo-classical economics posits. Indeed, markets are imperfect and real transactions differ from the neo-classical assumptions. That is why Williamson (2000) offered a more realistic approach to the too theoretic 'science of choice',



that is the 'science of contract'. Differences can be grouped under five classes of market imperfections: imperfect information, externalities, uncertainty, bounded rationality and the existence of transaction costs:

1. Information is often imperfect and distributed unequally between actors so that some parties have informational advantages. Asymmetric information induces some cost of monitoring in order to incentivize agents to behave according to one's interest and to prevent moral hazard. In the same vein, imperfect information also affects consumers who are often blinded about the intrinsic quality of products. That is why often a producer needs to signal the type of products he sells in order to attract the consumer valuing his product the best and to capture the highest share of the surplus.
2. Society's welfare is affected by missing information about resource scarcity, leading to incomplete markets and distorted prices and hence externalities.
3. There is uncertainty about production and prices. This is particularly the case in agriculture, as nature, which is often unpredictable, is one of the main determinants. Moreover, when products are commercialized, the literature identifies three types of risk: primary, competitive and supplier-based (Sutcliffe and Zaheer, 1998).
4. An agent's rationality is bounded. Indeed, human beings are limited in their capacity to foresee all possible states of the world and the associated set of probabilities and output. That is why they tend to behave opportunistically, making relationships unstable.
5. Selling production induces costs, so-called transaction costs (Coase, 1937). Indeed, transactions in markets are not frictionless and hence inflate opportunity costs by other costs associated with the fact of entering a market. Transaction costs can take two forms: they can be proportional or fixed transaction costs (Key et al., 2000). The former increase proportionally with the number of units exchanged and are associated with transportation and imperfect information. The latter act as a lump-sum tax and include the costs of search for customer or salesperson, the negotiation and bargaining costs and the cost associated to monitoring that is screening, enforcing and supervising (Key et al., 2000). If they do not induce subsidies or higher prices, the key point here is that usually these costs are borne by actors upstream, i.e. farmers. Hence, to save on transaction costs, farmers may engage in long-lasting relationships with suppliers and buyers.

Transactions costs coexist with another type of costs: adjustment costs. Indeed, when farmers decide to alter their input mix and/or output mix in order to answer adequately to changes in conditions, new transactions may have to be organized. These potentially lead to new relationships and hence new transaction costs. The resulting adjustment costs act as barriers preventing exit of a given type of production and hence reduce the potential of the market to readjust to the new optimum. Farmers' adaptation to the new conditions might induce two types of adjustment costs: short term versus long term change in the cost structure:

- First, we define short run adjustment costs as those that only relate to the amount of inputs, with given levels of quasi-fixed and fixed inputs. Operational decisions are made in the short run within the framework of strategic choices and relate to the amount of inputs and outputs. These decisions

are determined by the relative opportunity costs of all inputs and outputs and are facilitated by working capital markets (including supplier credit and buyer advance payments).

- Second, adjustment costs can result from changes in the long run. These are linked to strategic decisions which are decisions in the long run related to the technology set used and to whether to make or buy certain inputs or factors. These decisions are facilitated by equity capital markets in case not enough own financial resources are available. Hence, they also affect the level of debt of the farmer.

Two final remarks are worth stressing in order to completely grasp the nature of the farm and how its structural form determines the set of strategies available to the farmer following changes in market conditions.

First, if consumers and producers were to be a single integrated entity, market imperfections in general and transaction costs in particular would not exist. As the overall agricultural economy evolved from auto-consumption to market-based production, transaction costs appeared and have tended to increase. Transaction costs explain why some farmers still do not find it profitable to enter the market in developing countries and prefer consuming all what they produce (Eswaran and Kotwal, 1986; Sadoulet, et al., 1998; Goetz, 1992; de Janvry and Sadoulet, 1994).

The second relevant observation is that during the last decades, there has been a shift from family farming to bigger but more specialized farms. This is mainly explained by the gains from labour specialization and economies of scale. However, this new structural form required gradually more trade with external actors so that the decrease in family farming has changed the type and distribution of business costs. In particular, farmers now have to interact with external actors downstream, whereby they could lose part of their freedom and take the risk of bearing a higher share of transaction costs. Indeed, the division of tasks between different entities leads to power games inducing that additional costs caused by changing market conditions might be shared unequally within the chain of actors. Yet the potential concentration at the farm level is limited. This is explained by the seasonal constraints placed by nature, inducing the trade-off between gains from specialization and the subsequent increase in monitoring costs due to moral hazards problems (Allen and Lueck, 1998). Because it depends on nature and its rather unpredictable events, the organizational configuration of the farm is more restricted than its closest structural identity, the firm.

#### ***1.4 Perception, attitudes and mental models: mediators between internal & external conditions***

The adequacy of the answers developed by producers to changing conditions depends on their perception and capacity to answer. Indeed, only a reduced share of the conditions with a current or potential influence on the production system is actually perceived by producers. That is, firms are obviously open systems, but with limits in their bounded rationality and capacity to perceive, observe, and interpret messages from outside. Noe and Alrøe analysed these limits focusing on the farm, when they argue that "the internal complexity of the system limits the capability of the system to observe itself and the capability to observe the encompassing world" (Noe and Alrøe, 2015, p.136). Moreover, producers – even though they are far-sighted agents – might also be myopic about future events and

outcomes. That is, their perception of the future is imperfect and hence their strategies need to be adapted and fine-tuned according to the speed at which they receive and integrate new information. In the same vein and building on the concept of the firm as a self-organising system of communication, Noe and Alrøe suggest the adoption of Luhmann's concept of 'resonance' (Luhmann, 1989) to describe modes and limits of the communication processes between firm and the surrounding environment. The authors conceptualise the farm as an entity that screens itself off from most of environmental influences, reacting only to some of them (with an analogy from physics, they refer to the match of different 'frequencies').

This view can be enlarged from perceptions and cognitive processes to the role played by networks and communities on influencing producers' strategic decision-making. Ranges of approaches and categories have been adopted to conceptualise these 'webs of influencers' (Oreszczyn et al., 2010), gathering actors who variously influence producers' learning and behaviours. Among others, communities of practice (Lave and Wenger 1991) and the less formal networks of practice (Brown and Duguid, 2001) are regarded as arenas of interaction where social learning and knowledge brokerage take place between researchers, policy makers and civil society organizations (Galli and Brunori, no date). Further, socio-spatial knowledge networks (SSKN), highlighting the role played by networks on farmers' acquisition of knowledge and information about the external world (Sligo and Massey, 2007) have also been acknowledged as important drivers of producers's decision-making processes. In the same vein, producers' networks also play a role in the decision to adopt a new innovation and on its diffusion. That is why *Agricultural Knowledge and Innovation Systems* (AKIS) (Röling, 1988; Röling, 1990) have been in a first phase used to describe networks aimed at enhancing productivity and efficiency through a linear model of innovation<sup>2</sup>, to be then extended to diversification and rural development pathways (Pascucci and de Magistris, 2011) and to the bioeconomy (Esposti, 2012).

The type of imperfections in information diffusion and, in more general terms, the unavoidable limits in any real cognitive processes, determine what sub-set of the whole range of conditions is actually perceived and considered (or even consciously ignored) in the producers' decision making processes. Yet, it is worth pointing out that conditions outside producers' observation, even if they do not influence their decision-making processes, can still influence their performances and should hence be considered as drivers of change as well. It is also worth underlying that there is no overlapping between spatial proximity and perception by producers: conditions operating in the close spatial context of the farm may not be perceived by the producer, who could paradoxically be well aware (for example from newspapers) of events and situations developing at great distance.

A wide range of individual-based psychological, cultural and social characters are said to influence producers' decisions and strategies. Examples of such characteristics include education (McDowell and Sparks, 1989; Wilson, 1996), succession status (Potter and Lobley, 1992; 1996), age and length of residency (Wilson, 1996). They can be translated and summarised into the categories shown in the 'producer' element. More abstract categories such as attitudes, values and beliefs are quite complex

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<sup>2</sup> Those models showed the steps between 'scientific findings', 'technology transfer' and the subsequent 'farm transformation'



concepts, whose semantic richness and conceptual spectrum are well summarised by Mills et al. (2013).

Then the nature of the interaction between conditions and producer strategies lies in what the literature calls 'attitudes'. We consider that the definition of attitudes that is best suited to analyse the relation between conditions and producers' strategies is the one provided by Ahnstrom et al. (2008). These authors define 'attitude' as a readiness to act, or a mindset that is used by an actor to act and judge in situations of decision making.

Research fields that have approached this issue include:

- environmental conservation, environmental management and sustainable practices (Wilson, 1996; Salamon et al., 1997; Willock et al., 1999; Beedel and Rehman, 1999; Wilson and Hart 2001; Ahnstrom et al., 2008; Kizos et al., 2010; Gosling and Williams, 2010; Reimer et al., 2012; Mills et al., 2013);
- production orientation (Willock et al., 1999, Paulrud and Laitila, 2010);
- business risk and disease risk management (Mishra and Goodwin 2006; Lien et al. 2006; Hansson and Lagerkvist 2012; Kondouri et al., 2009; Garforth et al., 2013);
- contractual arrangements, with analyses of producers' trade-offs between secured market access and entrepreneurial freedom (Drescher and Maurer, 1999; Pennings and Leuthold, 2000; Key, 2005; Davis and Gillespie, 2007; Schlecht and Spiller, 2012);
- self-exploitation acceptance and profit seeking (Hinrichs, 2000; Galt, 2013);
- climate change adaptation and mitigation, in relation for example to crop adjustment and farm management practices or the parametric index-based weather insurance (Holloway and Ilbery, 1996; Grossi and Kunreuther, 2006; Barnett and Mahul, 2007; Gordon Arbuckle et al., 2013; Carter et al., 2014);
- empathy towards animals and animal welfare (Kielland et al., 2010).

A specific type of attitude regards the timing and the motivation for the adoption of innovations (E.g. more environmentally friendly practices) in a given context. The Adoption-Diffusion Model (ADM) (Rogers, 1983; Padel, 2001) helps identifying different farmers' attitudes *vis-a-vis* innovation adoption, distinguishing between 'pioneers', 'early adopters' and 'late adopters', each of them characterised by different timing, motivations and implementations of the innovation at stake. This taxonomy can be adapted to different types of innovation (technological, organisational) and to the more general adoption of new (at least for the farm and its context) strategies, like for example finance, risk-sharing contracts, multi-functionality, etc.

Further, the search and development of adapted strategies is also intrinsically linked to the level of risk-aversion that characterises the producer. Indeed, because returns to investment in new technology or new practices are uncertain, risky and imperfectly perceived, farmers risk-aversion will strongly shape his search and development of new strategies.

Similarly, agricultural practices are known to be strongly determined by mental models, which proves to be particularly difficult to change. As a result, farm development trajectories are often locked-in or path-dependent, that is, strongly dependent on historical events and the potential of change to agricultural practice is thus reduced.

Finally, producer characteristics should be understood as endogenous parameters. This means that they are called to be transformed and adapted in consequence of the producer's observation of performances resulting from the strategies he opted for.

## 2 Strategies

### *2.1 Strategies: decision making process in the light of perceived conditions*

Acting in specific multidimensional, multi-scale and evolving contexts, producers adopt actions and strategies aimed at coping with changing circumstances. Yet, when faced with similar conditions, different producers might opt for different strategies. Moreover, internal and external conditions themselves shape producers' characteristics and actions. Furthermore, different types of inter-dependent events can occur simultaneously and have multiple impacts on the success on primary production. Understanding why similar contexts lead to different strategies is one of the fields of investigation for the case studies.

Before describing in detail the inventory of strategies suggested for the SUFISA case-study analysis, some broad distinctions between strategy types can be distinguished:

- Strategies range from being more production-oriented, to others that involve off-farm (e.g., shift to part-time farming) or extra-farming (e.g., leasing of buildings) activities. As suggested by the AHM, they can be aimed at different objectives, including improving business performance, pursuing producers' visions and aims, protecting or enhancing household welfare. With regard to the fishing sector, an analysis of household strategies has been developed by Pettersen (1996) who studied cod fishery to identify types of strategies (expansion, diversification, entrenchment and withdrawal), and determinants (level of commitment to fishing, available alternatives) similar to those highlighted in the farming-focused literature.
- From another perspective strategies can be aimed at avoiding or limiting the effects of potentially harmful changes but also to proactively respond to present or future opportunities. Resistance to change and adaptive renewal (Darnhofer, 2010) are two opposite poles, between which numerous intermediate and cross-cutting strategies can be identified. The decision-making process often entails a choice between long-term adaptive capacity to cope with stresses and shocks and short-term profitability, as well as between adaptation and new development trajectories<sup>3</sup>. In other words, strategies can be aimed at developing and strengthening a business, or alternatively at merely surviving in adverse conditions, with all the intermediate and mixed possibilities potentially

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<sup>3</sup> Overall conditions influence this choice. It has been argued, in regard to the fishery sector but with potential broader scope, that long-term financial planning strategies are breaking down in tough times, to be replaced by short-term coping strategies (Binkley 2010).

being encountered. As expressed by Gasson (1986, p. 364) “a survival strategy could be interpreted as a desperate clinging on to the means of existence or an accommodation to gradually changing circumstances”. In more extreme cases, strategies can also be represented by partial or complete abandonment of the production activity, with a shift towards part-time farming and pluriactivity, the mere acceptance of lower incomes, or retirement without being replaced (Fuller, 1990; Evans, 2009; Andrade, 2015).<sup>4</sup>

- Different strategies can certainly be considered as mutually exclusive (as in the case of the choice between intensification and low-intensity farming). However, in most of the cases this is not so. A producer may adopt more than one strategy simultaneously. Such strategies might be considered as complementary aspects of a diversified development trajectory, meaning that the producer is either trying to diversify his business into more or less independent paths (externalisation of some technical processes, opening a direct selling point) or to create synergies between complementary strategies (e.g., moving to part-time personal work to gain extra-farm income while hiring external workers for the farm).
- Finally, most of the strategies can be implemented by a single producer, yet the presence of some supportive actors may become indispensable as they are part of the ‘external conditions’; some others are collective strategies (like for example collective political lobbying or the creation of a territorial brand). This distinction can be important in the analysis of specific case studies, where the suitability of a producer to certain strategies may also rely on the presence of other producers willing to cooperate in that particular action.

## *2.2 Identification of strategy types and clusters*

Several typologies of strategies have been suggested in the literature. These include those named as ‘adaptation’, ‘survival’, ‘adjustment’ and ‘development’ strategies (Marsden et al., 1989; Munton, 1990; Ilbery, 1991; Moran et al., 1993; Lehmann, 2003 as quoted in Mc Elwee, 2005; Evans, 2009; Mills et al., 2013; Andrade, 2015), all of which have a different meaning and act at various levels of aggregation. Some lists of typologies aim at providing a more comprehensive picture, whereas some others focus on sub-set of strategies. An example of the latter would be the diversification options listed by Ilbery (1991). For the definition of our inventory (Figure 4), we have examined suggestions and ideas from the aforementioned authors, trying to account for an as wide as possible range of possibilities and perspectives. The base for our work was given by the classifications made by Moran et al. (1993) (six development paths classified according to use of resources), and Munton (1990) (seven elements of change in farms' adjustment strategies). These were then updated following the most recent literature which provides further insights into the less pro-active and more survival-aimed

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<sup>4</sup> The mere acceptance of adverse events or a retirement can hardly be seen as a ‘strategy’. In sociological literature the term ‘strategy’ is not always accepted when farms do not follow a specific plan with an identified target (Crow, 1989; García-Arias et al., 2015). Besides, talking about farm ‘survival’, Redclift (1986) argues that the term ‘strategy’ implies a long-term conscious perspective, and that people who have this capacity usually do ‘more than survive’. Yet, following many of mentioned authors, we use strategy in a broad sense to encompass all the actions implemented by producers to pursue its objectives and which have a significant impact on its business and household.



strategies (Andrade, 2015). Each coloured box describes one strategy that is then further described in detail including the various forms and tools it encompasses. Strategies are indicatively grouped - through the use of the same colour - according to similarities in their harvesting/organisation/use of resources and/or main aims, in order to provide a reader-friendly landscape of possible strategies. This grouping is merely indicative, and is ultimately aimed at facilitating a rapid appraisal of the possible typologies of strategies.

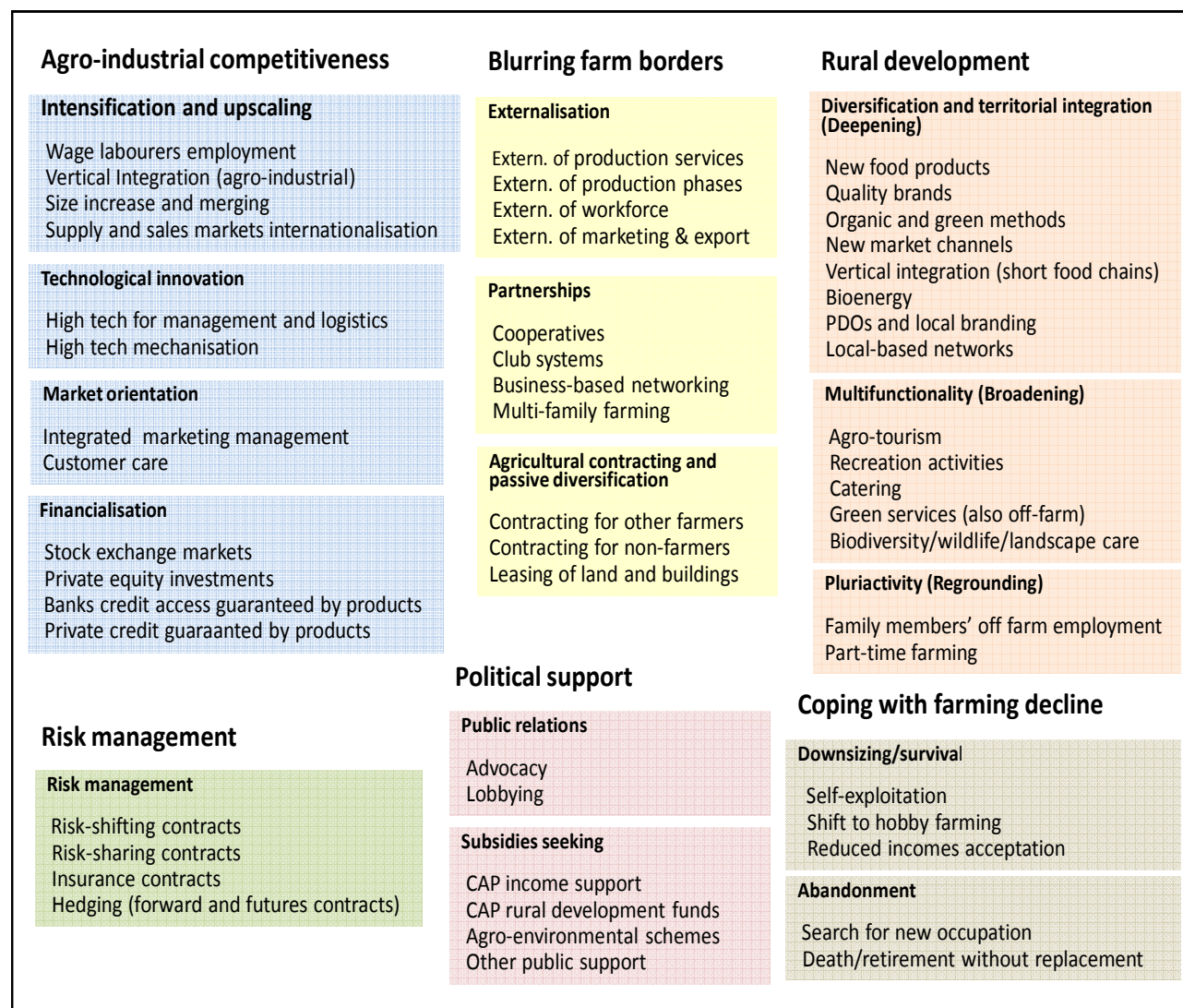


Figure 4: Map of producer strategies

## 2.3 Description of strategy clusters

### 2.3.1 Agro-industrial competitiveness

The first cluster of strategies indicated as 'Agro-industrial competitiveness' is focused on three levels of innovation: technology, marketing and finance. All of these levels are relevant also for other types of strategies, but that are hereby considered in a classic industrial competition perspective. These strategies mainly aim to increase producers' competitiveness on the global agro-food markets. They do so by enlarging the business size in order to achieve a critical mass of budget and market shares and to profit from scale economies. This is a well-known trend at the global agro-food system level (Mühlfeld et al., 2011), but also relevant for family farming and fishing, where a continuous trend exists towards the 'survival of the largest'. Neo-classical economics explains the key determinants and characteristics of these strategies and trends. Regarding the farming system, a specific feature is the persistent aim to make agriculture more standardised and controllable through the appropriation and substitution processes that were already described almost three decades ago (Goodman et al., 1987). The latest innovations in high-tech mechanisation, robotisation and information technologies enlarge the opportunities – even for small-scale producers – in this regard. Besides, technological developments have opened other scenarios for innovation, including the possibility for farms to use by-products from other farms and industrial companies as inputs, thus activating the 'industrial symbiosis' between different sectors that was analysed by Chertow (2004). These initiatives witness how primary producers, far from being mere innovations-takers, can be proactive developers of innovative solutions. Innovation, and even technological innovation, can be generated within the farms and also in research and extension centres. This process is rendered with even more strength when the socio-technical context supports producer-based innovations and their diffusion, as it has already been argued in relation to the technological conditions (Murmann, 2013).

Other strategies focus on market positioning and relations with customers. The so-called *market orientation* paradigm (Kohli and Jawaroski, 1990; Narver and Slater, 1990) expands the traditional scope of marketing activities to encompass the whole production process. This process is then to be designed according to the acquisition and use of information (marketing intelligence) about consumer expectations. Building on this frame, Heiens (2000) distinguishes between four different typologies, including 'strategically integrated companies' which focus their marketing intelligence both on consumers and competitors, and 'customer preoccupied' companies that are focused on the relations with customers<sup>5</sup>.

The last type of strategy considered in this cluster is financialisation. This is a phenomenon that can be observed from two apparently opposite and yet mutually complementary angles: as a way to invest capital and as a way to harvest funds. Dealing with producer strategies, we focus on the second perspective, as the former can be considered among the 'conditions'. In some sectors, farms with certain requirements in terms of size, accountability and attractiveness can harvest funds in the financial markets through asset management companies, private equity consortia or other financial

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<sup>5</sup> Coppola et al. (2005) give a clear summary of these approaches in a study (in Italian) focused on wine producers.

instruments (Burch and Lawrence, 2013). Some high value-added products are characterised by long-term production processes (such as cheese, ham and wine making), with cash-flow dynamics requiring strong anticipation of financial resources. In these cases, financial resources can be obtained by banks though the use of the same products under transformation as credit warrants. These strategies have recently evolved into the strengthening of direct relations between producers and investors by-passing banks: producers emit bonds directly purchased by investors and guaranteed by their own products.

### *2.3.2 Blurring farm borders*

High tech and financialisation are not always the most appropriate or suitable solutions, and in some cases size increase can even be counter-effective. In some contexts producers opt for a more flexible or efficient organisation of resources by focusing on some activities and externalising others, or by establishing strategic partnerships and networks. These strategies represent different ways to blur farm borders in order to achieve a range of objectives. Partnerships and cooperation can create scope economies, or spaces where quality products can be differentiated and protected by price-based market competition, as in the case of clubs (Demydas and Hormann, 2008; Legun, 2015). Externalisation and agricultural contracting can be seen as ways to improve efficiency through specialisation and cost optimisation. In addition, they can help to move towards less complex contexts where a more specific business can be conducted. Noe and Arnøe (2012) consider (vertical) differentiation as a strategy useful to reduce the complexity with which the farm system needs to deal. This includes attributing different autonomous organisations with responsibility for specific operations.

The choice between internal implementation and externalisation of parts of the labour process is complex and implies considering details regarding the degree of specialisation, flexibility and resilience, relationships between fixed and variable costs and control on the processes. For a primary producer, relying upon the market for activities that could also be carried out within the farm does not necessarily lead to a loss of control, as this outcome depends on variables such as market power relations between producer and service provider and degree of agency.

Due to asymmetric information (Hart, 1995), bounded rationality (Hobbs, 2003) and ex-ante or ex-post opportunistic behaviour (Williamson, 2000; Laffont and Martimort, 2009), efficient strategies are chosen based on associated transaction costs. If transactions were without costs, it would make little difference, at least in strictly economic terms, whether factors of production were purchased on the market or produced internally (Ventura and Milone, 2004), and the same could be argued with regard to production phases. These costs include search (information) costs, negotiation costs, and monitoring and enforcement costs (Hobbs, 2003). The interactions between producers and governance structures (market, hierarchy or hybrids) are characterised by a degree of complexity (of the products to be produced, of the services to be delivered) that also require analyses on agents' attitude towards risk (Hart, 1995); contract incompleteness and bargaining power (Wu, 2014), and residual allocation of property rights (Barzel, 1982).

Neo-institutional and neo-classical economic approaches have investigated decision making based on bounded rationality in a market failures context, resulting in the formulation and adaptation of agency

theory and mechanism design (Milgrom and Roberts, 1992; Allen and Lueck, 2002), coordination mechanisms (Bogetoft and Olesen 2004; Borgen and Hegrenes 2005) and the functioning of institutions (Hagedorn 2008).

### 2.3.3 Rural development

A range of strategies, often implemented in mutual synergy, are centred around the re-grounding of farming into their territories and the re-valorisation of small scale and proximity. These strategies range from the re-discovery of abandoned varieties to the adoption of environmentally friendly production methods and extend their scope to cover a range of multifunctional activities and services that farms can provide to consumers and society as a whole. Through these strategies products can be valorised and extra value-added value can be both produced (through the price premiums customers are willing to pay) and retained by primary producers (when short chains reduce the number of intermediary steps and reduce or exclude the role of large retailers). Approaches such as post-productionism (Ward, 1993; Wilson, 2001) and rural development (van der Ploeg et al., 2000), culture economy (Ray 1998), and social embeddedness (Hinrichs, 2000), have been developed in the past two decades to describe these changes. In these trajectories, vertical and horizontal networks among rural actors (Murdoch 2000) can reproduce, on a territorial basis, elements of synergy and scale economies that small-scale farming could hardly achieve in isolation. Other authors (Zasada, 2013; Bartolini et al., 2014) highlight farms' diversification towards increasing environmental quality (amenities) and widening their socio-economic context (i.e., uncertainty in market prices and off-farm income opportunities).

With regard to fisheries, similar reflections have been made by Salmi (2015) and White (2015), who highlight the move towards post-productivist patterns and the strong influence of policy measures among coastal small-scale fisheries.

A model developed by van der Ploeg et al. (2002), the 'value triangle in modern agriculture' effectively summarises these strategies. This model identifies three innovative development pathways beyond conventional agriculture. The terminology developed by van der Ploeg (2002) has been acknowledged in our classification:

- *deepening* (development of non-conventional farming and supply chain practices (organic, short chains, local varieties etc.);
- *broadening* (development of non-food productions and multifunctional services);
- *re-grounding* (development of /engaging in sources of employment and income complementary to the agricultural one).

The capacity of re-directing resources in new ways to deliver innovative services is a prominent character of this group of strategies. Following the Assemblage Theory approach (DeLanda, 2006) farming systems can be seen as an assemblage of components with characteristics, dynamics and functions that are not fixed (though they were meant to be, when those components were created), but can change according to re-assemblage practices.

### *2.3.4 Risk management*

The strategies to cope with production, business, productive, and ecological risks are mainly based on contracts and legal arrangements through which risks can be shared among partners, or partially or completely shifted to others. The more traditional solution is to rely upon insurance markets where risks are covered in exchange of a fee. Insurance contracts are still widely used to protect from the consequences of extreme weather events. Agricultural insurance is applied with many difficulties (Miranda, 1991). The obstacles to the implementation of insurance in agriculture can be found in systematic differences between the various actors of modern agriculture, as well as in the lack of understanding of farmers' decision making processes related to risk insurance schemes. Yet financial markets are gaining relevance, with hedging increasingly being used by producers to protect from price risks. However, price volatility is still a huge problem for farmers. Market-based instruments for managing agricultural price risk such as forward and futures contracts are well established tools in this area. Production contracts represent an additional strategy to share risk with up-stream or downstream chain actors (Bogetoft and Olesen, 2004).

Focusing on aquaculture, but with reflections applicable to farming, Bergfjord (2007, p. 114) highlights two main reasons to engage in futures market (or other similar tools) "The first reason is hedging. A futures market allows everybody exposed to price risk from the commodity to hedge their positions. Second, a futures market allows for intertemporal allocation and pricing of goods, usually smoothing out 'unnecessary' price peaks". Choice and adoption of these tools is influenced by various farm and household characteristics (farm, size, off-farm income, education and age of producers, levels of business risk) as proved by Velandia et al. (2009). Some more traditional strategies like self-insurance, in the form of "building reserves in good times to cover costs in bad times" (Freshwater 2015, p.512), are effective with short and minor downturns, as it is also the case with various forms of diversification (production place, sector, market channels, spreading sales)<sup>6</sup>.

### *2.3.5 Political support*

All of the above described strategies aim – yet with different approaches and visions – at adapting and strengthening producers in a competitive context through higher productivity and cost reduction, product valorisation, risk management and so on. Yet, many producers are highly influenced, if not fully dependent, on public support. Not only because public support influences producers' capability to invest and to cope with risks (Kondouri et al. 2009; Sckokai and Moro 2009), but also because it can be the dominant income source. In some case this reliance becomes a true strategy; this is why a specific typology has been suggested for political support. Some relational actions, like advocacy and lobbying, aim at influencing policy makers and other stakeholders, and in more general terms at protecting and promoting primary producers' interests and visions. These actions, often collectively undertaken, can also be considered as strategies.

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<sup>6</sup> These extra-financial tools to cope with risks are just mentioned here, as they are elements of strategies described in other groups.

### 2.3.6 Coping with decline

A final set of strategies describes all those situations in which a farm ‘merely’ copes with the decline of its activity, finding ways in which the household can survive, or even improve its livelihood standards. This can happen with or without a central role being played by the farm or fisheries business. In such situations the AHM seems to be particularly capable of interpreting objectives and choices. Specific features characterise the actions undertaken by fishermen, who are constrained by the effects of overfishing on one side and by strict regulation on the other, and whose central goal becomes to derive sufficient economic returns from reduced stocks (Davis and Gerrard 2000). It has already been noted that some of these choices can hardly be considered ‘strategies’ in the true meaning of the term. Nevertheless, there is often a strategic vision about the future of a person, a household, or an activity, with a conscious and not fully constrained choice being made between different options, that may ultimately lead to part-time farming or fishing, to the acceptance of reduced incomes and/or self/exploitation, or to the decision of abandonment.

## 3. Institutional arrangements: an overarching strategy

### 3.1 Definitions

#### 3.1.1 Institutions and institutional arrangements

In his book *Institutions, Institutional Change, and Economic Performance*, Douglas North defines institutions as ‘rules of the game in a society’. Institutions shape human interactions, and thus business interactions, by constraining them. Because farming and fishing is about producing but also selling food, institutions play a big role in the farmer’s decision making. Institutional arrangements refer to the materialisation of institutions. Hence, as far as the food system is concerned, institutional arrangements incorporate the networks of relationships leading to the production and delivery of food. Institutional arrangements result from the combination of market arrangements and public requirements and incentives.

North (2005) observes that institutional arrangements evolve over time and they are a combination of formal constraints, informal rules, and their enforcement characteristics. Formal constraints encompass constitutional constraints, statutory rules, and other political constraints (Williamson, 2009), while informal rules are private constraints stemming from norms, culture, and customs that emerge spontaneously. Therefore, formal and informal concerns can be disentangled on the basis of design and enforcement. Formal constraints are centrally designed and enforced, while informal institutions remain located within private exchanges and are not enforced. North (2005) lists as informal constraints taboos, customs, traditions and codes of conducts, while the constitution, laws and property rights are formal ones. The ability of a third (or non-contracting) party to detect opportunistic behaviour by a non-compliant agent and to force the respect of contractual clauses explains the enforceability of the contract.

A strand of literature shows that private institutions or informal rules can have some degree of complementarity with the absence of formal law or inefficient court enforcement (Milgrom et al.,

1991). Therefore, on the basis of Williamson (2000), a transaction can result from three optimizing processes in a given social environment, i.e., the institutional environment, market organisation and resource allocation mechanisms (figure 5).

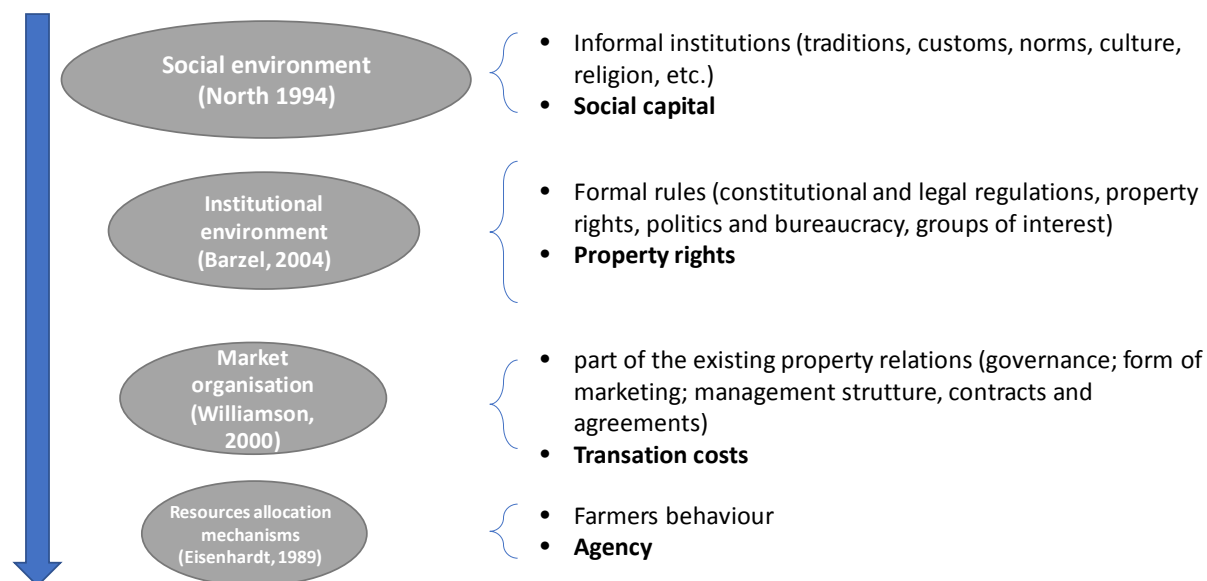


Figure 5: Conditions affecting a contractual relation

The social environmental level contains factors, often with a spontaneous origin, that are practices for centuries, take a long time to change and are embedded into religion, culture, tradition, culture, and community. Among the conditions listed in chapter two, the socio-demographic (i.e., cultural context about farming); socio-institutional (i.e., social capital) can qualify the social and environmental level. Such elements represent the social embeddedness and they have the ‘last grip on the way society conduct itself’ (Williamson, 2000).

The institutional environment defines the formal rules encompassing the constitution, legal regulations and policies as well as the definition of power among the several institutions. When it comes to food production, the public sector regulates the production and delivery of food and incentivizes some practices by subsidising them.

The third optimising level refers to the market organisation, which includes the governance of contractual relations, thereby facilitating the mitigation of conflicts and the pursuit of mutual gains. The form of market organisation is re-shaped periodically on the basis of observed inefficiencies or the expected possibility of raising mutual gains. Market arrangements take the form of horizontal and/or vertical coordination between actors, as described elsewhere.

The lower level of analysis shows the actors’ behaviour and the continuous adjustment towards changes in prices, input costs, investment and risk attitude. This level of analysis deals with solving agency problems.



In SUFISA, we concretely address Institutional Arrangements (IAs) as combination of horizontal cooperation, vertical coordination and public intervention. First, horizontal cooperation entails a collaboration among farmers that are located at the same level of the supply chain. Here, farmers take the initiative. Second, vertical cooperation entails a collaboration between farmers and other supply chain actors that might be located downstream or upstream. Usually, farmers are not in the lead here, with the notable exception of dairy cooperatives. These arrangements are mainly driven by economic motivation (to capture economies of scale or increase market power) but also by environmental (sharing water permits, crop rotation and livestock, biodiversity, etc.) and social ones (fair distribution of profit, equality, self-confidence, relational aspects, respect, etc.).

### *3.1.2 Horizontal cooperation*

Horizontal cooperation mainly takes the form of associations of members sharing common interests. Producers may want to bargain collectively with sellers of inputs or buyers of produce. The mechanism behind this strategy is a reduction in the number of parties: as the buyer tends to monopsonistic power, sellers act collectively to reduce the number of their voices and hence increase their bargaining power. Producers may also decide to join into a producer organisation to share common resources and thus to save on costs. They may also collectively manage risk through common insurance mechanisms. Producers may also decide to coordinate and exchange inputs.

One necessary condition for the success of horizontal cooperation is that none of the cooperative members deviate from the ex-ante agreement. Ensuring the latter commitment relies on two characteristics: (1) none of the producers should be big enough to undertake the contract alone and (2) a large cost of deviating should be credibly announced or informally known and believed ex-ante.

Horizontal cooperation does not only have advantages. Indeed, when producers coordinate, they do so at the expense of some decision power. Profits are sometimes (partially) shared and may thus reduce the incentive to provide effort and invest in complementary sustainable practices, that are not required within the coordinated group. Moreover, democratic systems might limit the capacity of adaptation to market changes because of the difficulty to coordinate.

### *3.1.3 Vertical coordination*

Vertical coordination is the means by which products move through the supply chain from producer to consumer (Mighell and Jones, 1963). It is usually characterised by a rise in contracting, greater product differentiation and the increased importance of supply chain relationships (Young and Hobbs, 2002). It usually materialises into written down bilateral commitments in order to avoid moral hazard problems and reduce transaction costs (Bonjean and Mathijs, 2016). For many years now, production and marketing contracts have been set in all subsets of the supply chain, from producers, to processors and then retailers, so that actions are gradually more predictable and decided ex-ante. Hence, actors tend to coordinate. To optimise production processes and costs, actors also tend to specialise more. Tasks tend to be harmonised or outsourced. This leads to very specific types of contracts in order to organise strategic alliances, joint ventures or franchising practices, among others (Young and Hobbs,



2002). Actors in the supply chain recognise each other to be complementary and take complex bilateral or multilateral well-written commitments in order to prevent agency issues.

To characterise the governance of value chains, Gereffi et al. (2005) developed a taxonomy of arrangements observed. First, they define market linkages, i.e., arrangements that can persist over time with repeated transactions, still the essential point being that the costs of switching to new partners are low for both parties. Second, modular value chains are for products made to a customer's specifications, where the supplier takes full responsibility for competencies surrounding process technology and the use of generic machinery. Hence, producers customize products for buyers using flexible machinery to pool capacity for different customers. Third, relational value chains are complex interactions between buyers and sellers, often creating mutual dependence and high levels of asset specificity. Trust and reputation are key in supporting those linkages. Fourth, captive value chains are chains where small suppliers depend on much larger buyers, because they face high adjustment costs. Finally, hierarchy stands for vertical integration with a top-down managerial control where producers are subordinates or sometimes affiliates.

The emergence of one of the five governance types depends on three characteristics of the transaction: its complexity, the ability to codify it and the capabilities in the supply-base, as presented in Table 1. The resulting degree of explicit coordination and power asymmetry ranges from very low for the market governance types to very high for the hierarchy.

Table 1: Key determinants of global value chains governance

Governance type	Complexity of Transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
<b>Market</b>	-	+	+	--
<b>Modular</b>	+	+	+	-
<b>Relational</b>	+	-	+	-+
<b>Captive</b>	+	+	-	+
<b>Hierarchy</b>	+	-	-	++

Source: Gereffi et al. (2005)

### 3.2 An overarching strategy

In the CSP approach we described how producers develop strategies to answers to conditions prevailing in their sector. As institutional arrangements tackle multiple conditions at the same time, we consider them as being an overarching type of strategy. Indeed, when engaging in an institutional

arrangement, a producer may deal at the same time with the production constraints of the commodity but also its own marketing abilities and the type of transactions required by the specificities of the market. Hence, we develop in Figure 6 an adaptation of Figure 1 built in section 1.1. Figure 6 is centered around institutional arrangements (IA). The IA set contains combinations of public intervention, horizontal cooperation and vertical coordination. Because they result from the confrontation of different and maybe diverging interests of supply chain actors, IAs provide the producer with a partial answer to the conditions he faces. Hence, a producer will decide to enroll into a given, or more, IA according to the internal and external conditions he faces. This IA will provide him with a set of side-strategies enabling him to address some (or all) of the conditions he has to cope with. Other IAs or other non-business strategies, might be needed to cope with conditions. In other words, producers may participate in several IAs simultaneously. Hence, the fact that not only external conditions (sector specific) but also internal conditions (farm specific) affect the choice of IA enables us to elicit different IAs for a given sector, the choice of one or another being driven by the difference in internal conditions.

A meaningful example is the organisation of growers into a club selling a specific variety of a commodity, e.g. the apple variety Kanzi©. Kanzi© is a protected cultivar under a registered brand. Growers use it as a way to differentiate, answering to the oversupply of apples and the resulting low prices. Promotion is centrally coordinated because of its high costs and the need to signal high quality to the consumer having a high reserve price for high quality fruit. A marketing agency estimates the size of the market share maximising profits and restricts the supply of fruit by keeping the population of trees at the optimal level. Quality is secured by technical advice, selection of well-suited and high quality land. Further, only high quality fruit is retained, the rest being sold under another name.

Note that SUFISA is a producer-oriented project. Hence, we are interested in the IA at the level of the producer. If downstream or upstream actors are themselves organised in a way that does not affect the producer<sup>7</sup>, this is outside of the scope of the SUFISA project.

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<sup>7</sup> Note that often institutional arrangements up- or downstream to the producer affects him through the distribution of market power.

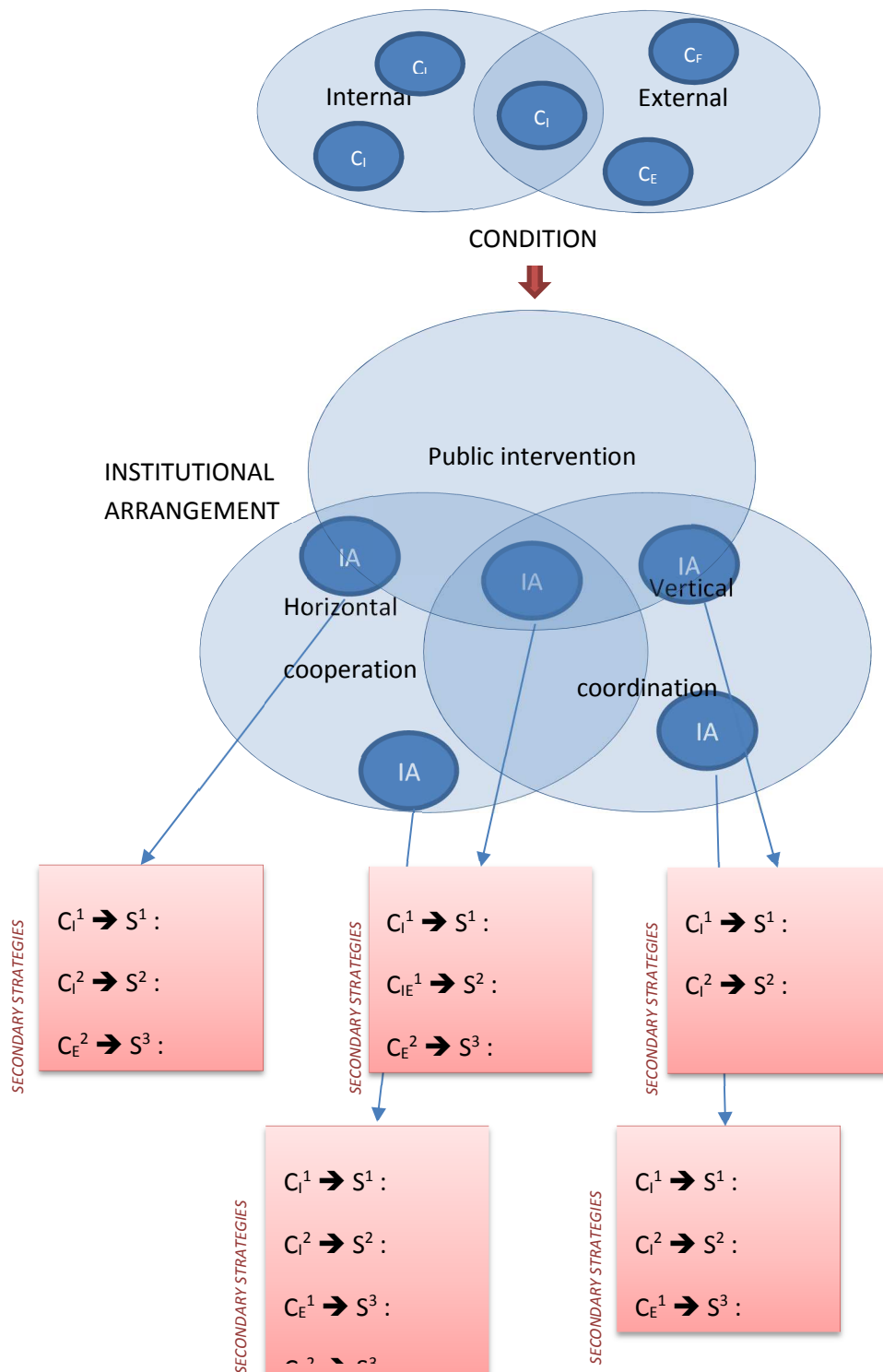


Figure 6: Understanding institutional arrangements

Source: own elaboration

Legend:  $C_E$  = External Condition ;  $S$  = Secondary Strategy ;  $IA$  = Institutional Arrangement

### 3.3 Characterisation of institutional arrangements

The number of possible combinations of horizontal cooperation, vertical coordination and public intervention are vast and context specific. Supply chains use different coordination mechanisms to organise economic activities. While for the spot market, the optimal coordination mechanism is the price, the firms as hierarchies predominantly rely on direct supervision/order as a coordination mechanism. A wide range of hybrids is found in the real world: such as peer groups, cooperatives, contracting, networks, franchising and collective trademarks.

In Figure 7, we give some examples of combinations and the location according to the three dimensions. In fact, it is likely that the majority of the IAs found will combine all three dimensions. Further, IAs that appear rather similar may in fact vary in their governance, that is who decides on what and how decisions are being taken.

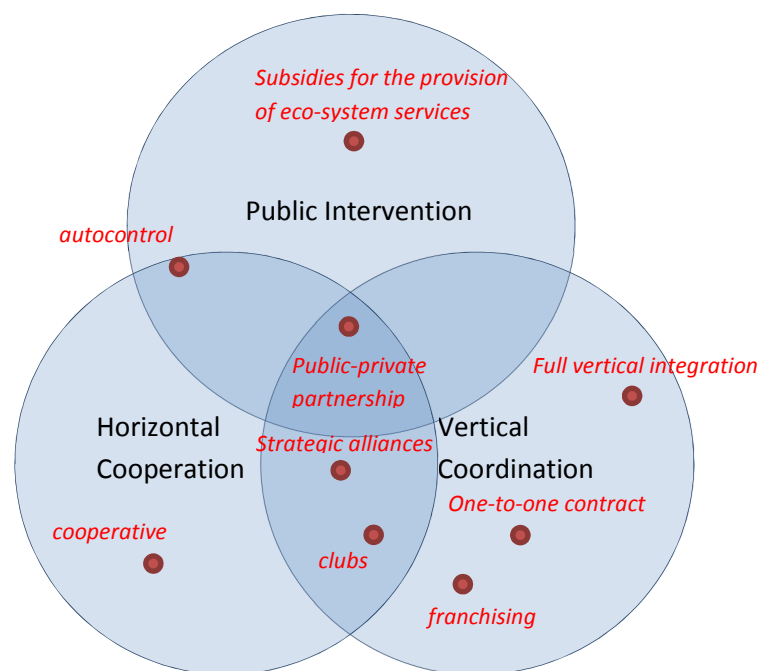


Figure 7: Examples of institutional arrangements

The supply chain is subject to several sources of risk, which could be 'strategies or tactics' and lead to ineffective resilience (Mensah and Merkuryev, 2014). Actors engaged in a transaction will reduce or transfer risks through contractual arrangements. The risk, strategic behaviour and investment attitude can be used to explain producers' position along the supply chain, as well as the preference for contractual arrangements. In the previous chapter, we highlighted that all possible producer strategies, among which market orientation and risk management are used to explain producer behaviour within a supply chain. In fact, from a producer perspective contracts may imply the transfer of decision-rights and shift of risks from producers to the buyers. Very large literature deals with risk

management in the farming system. Velandia (2009) shows that a generic producer chooses a portfolio of risk management instruments to provide the best income safety net for his particular situation. Meuwissen (2001) highlights that through contracts producers can perform a risk-shifting contract (e.g., a fixed-forward price contract): the risk-shifter pays a kind of premium to the risk-taker and in return receives a guaranteed price, or risk-sharing contracts (based on the concept of “pooling”). The supply chain evolves toward several drivers: cost-reduction, internal synchronization, harmonisation of the process and final customer satisfaction (Halldorsen et al., 2007).

The food supply chain is subject to specific conditions: unbalanced bargaining power, different risk attitude among supply chain actors, as well as asset specificity and high degree of investment irreversibility, asymmetric information, uncertainty and unfair practices (i.e., delaying payments or interlinked contractual relations within food chain (Fertö, 2005). These conditions can affect the incentive to pursue opportunistic behaviour as well as the creation of a hold-up problem linked with poor or inefficient contract enforcement. Therefore, the asymmetric information along the supply chain and between consumers and actors (Lusk, 2017) as well as control of information by few retailers, gives very high relevance for coordination mechanisms as well as the creation of credible guarantees about the expected quality of products or processes (Menard and Valceschini, 2005). Yet, Bogetoft and Olesen (2002) show three main coordination problems: a) ensuring that contracting parties will exchange resources and will provide the right production in the right time and space ; b) motivate the contracting parties with individual incentives to take socially (or external) desirable decisions (i.e., effective level of public goods required by the market); and c) ensuring that coordination and motivation are provided at the lowest possible costs. Menard (2004) suggests that incentives are the best way to organise transactions as the rental seeking behaviour is an engine when a transaction involves pooling resources and coordination of decisions. To summarise, two mechanisms shape the form of transactions within an agri-food supply chain: a) coordination and incentive design (due to risks attitude and opportunism ex-ante and ex-post contract) and/or b) reduction of transaction costs and operative costs (due to asset specificity, typology of transactions and uncertainties). A generic contract is subject to two sources of risks: ex-ante contracting, search and inspection or ex-post contracting, control and enforcement. Figure 8 represents the contracting risks.

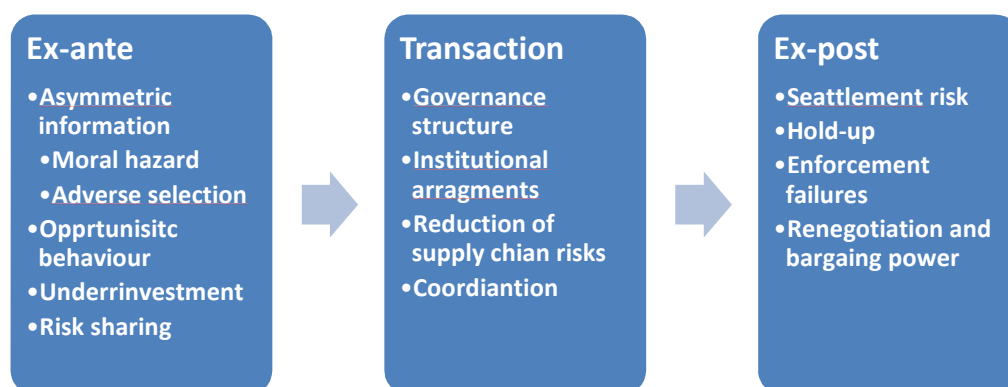


Figure 8. Ex-ante and ex-post risks in contractual arrangements

The asymmetric information between producers and consumers deeply affects the transaction along the food value chain. Thus, moral hazard is a relevant problem in the market when the quality of productions cannot be verified by consumers. This is, for example, the cases of food production and consumption (Lusk, 2017). Several authors have motivated the creation of standards (HACCP) and labelling to reduce moral hazard, by trying to communicate consumers different processes of food production (Unnevehr and Jensen, 1999).

The need to reduce asymmetric information along the supply chain impacts also the governance structure and the institutional arrangement forms. Sellers and buyers relate to each other as principals and agents with a realistic assumption being that principal and agent have different goals and quality of information which can generate a rent for one of the two parties as well as increasing the risk of transactions (Minarelli et al., 2016).

Incentive mechanisms enable to avoid both adverse selection and moral hazard. Yet, both strategic behaviours reduce the efficiency of an agri-food value chain in several ways: a) risk of ineffective quality control in the agri-food industry, process etc.; b) inefficiency due to participation costs and rent seeking behaviour; c) underinvestment under uncertainty and asset specificity or irreversibility in making an investment. The agency problem arises when the principal has incomplete information to verify the agent's behaviour, or is not able to establish a reward mechanism linking with an observed action of the agents. Tirole (1999) and Hart (1995) observed enforcement is costly and can generate a risk of ex-post opportunistic renegotiation ('hold-up risk'). Hold-up affects the decision to invest reducing the contracting parties' incentives for specific investments or can encourage both parties to abandon the contractual form in favour of vertical integration.

In addition, a transaction may be affected by settlement risks, where one of the parties may fail to deliver in security. This often leads to post-contract strategic behaviour which is the theoretical basis

of the incomplete contract (Hart, 1995). A contract is incomplete, when all contingencies are not included into the contract and clauses allow for ex-post strategic behaviour. Hart (1995) defines “an incomplete contract has gaps, missing provisions, and ambiguities and has to be completed (by renegotiation or by the courts) with strictly positive probability in some states of the world.”

Kvaløy (2006) observes that risk attitude, ex-post bargaining power and outside options are relevant parameters in contracting relations and proposes a relational contract or self-enforced contract as solution, with a prominent role of reputation and a trust among agents. The hold-up problem may create a sunk cost when contracts will be renewed as well as explaining investment specificity (kind of IA which incentives the seller to make specific investments). The different contractual agreements depend on several variables: specificity of assets, frequency of the trade, switching on and off costs, enforceability by a third party and asymmetric information (Kirsten and Sartorius, 2007).

Beside the agency problem and incomplete contract literature, the social exchange theory describes a business exchange and restricts opportunistic behaviour by observing the function of the mechanisms (i.e. trust, and networks of producers). Following Qui (2018) a contract could be an interactive relationship between partners considering having a material and non-material exchange. Yet, in this context, Willson et al. (2005) show the relevance of trust and legal courses in explaining preferences among alternative contractual forms in the wine market. To summarise the literature on contracts, we can highlight four types of contract according to the main objective, the transfer of decision right and finally the shift of risk from farmers to the buyer (Key and Runsten, 1999). Table 2 describes types and features of contracts within food supply chain.

Table 2: Contract types

Contract type	Objective	Decision-making	Sharing risks	Strategic behaviour	Uncertainty
Market specific contract	Buyer is obliged to find a market outlet to farmers. Contracting parties agree on conditions (timing, quality, quantity and price)	Farmers keep control over production.	Part of risks is shared with buyer.	Contractual mechanisms to reduce adverse selection and moral hazard.	Underinvestment when specific investment is required. Option to delay investment decision.
Management providing (i.e. pea tournament contract)	Similar to the previous but the buyer would have control (or require specific investment during production phase)	Farmers delegate some specific decision to the buyers	Buyer bears large part of risk (increasing of risks exposure is compensate by higher quality or production/process ensured).	Reduced possibility to observed adverse selection.	Buyer compensate risk of investment costs. Timely investment decision.
Resource providing contract (i.e. golden kiwi contract)	Very closed to vertical integration as buyer provides also input and technical assistance to the farmers (i.e.	Farmers keep a residual control over decision making	Buyer has all production risks	Very unlikely adverse selection and moral hazard	Require assets specificity and investment irreversibility.
Relational contract (i.e.. public standard plus private standards)	Specify only general term of contract but mechanism for dispute resolution is well specified.  Long-lasting contract implies to pursue long term gains (i.e. production quality)	Farmers does not delegate the decision making.	Risks are shared between parties due to establishment of mutual dependencies	Reduced by trust and long-lasting contract	Long-lasting contract increase investment behaviour also in condition of uncertainty

Source: Key and Runsten (1999)



## 4 Performances

### 4.1 Producer performances and the whole canvas of CSP

Figure 9 summarises conditions and strategies, while sustainability performances are added on the right side<sup>8</sup>. By ‘performances’ we mean the consciously pursued effects of strategies. Unintended consequences are other forms of ‘impacts’ of these strategies, that can be accounted for (and can be highly relevant in themselves and for their feedbacks, as shown in Figure 9) but not considered ‘performances’ in a strict sense. We remind here what was argued in the introduction with regard to the fact that performances are the result of strategies implemented in an evolving context, so that they cannot be identified as fully predictable consequences of the strategies.

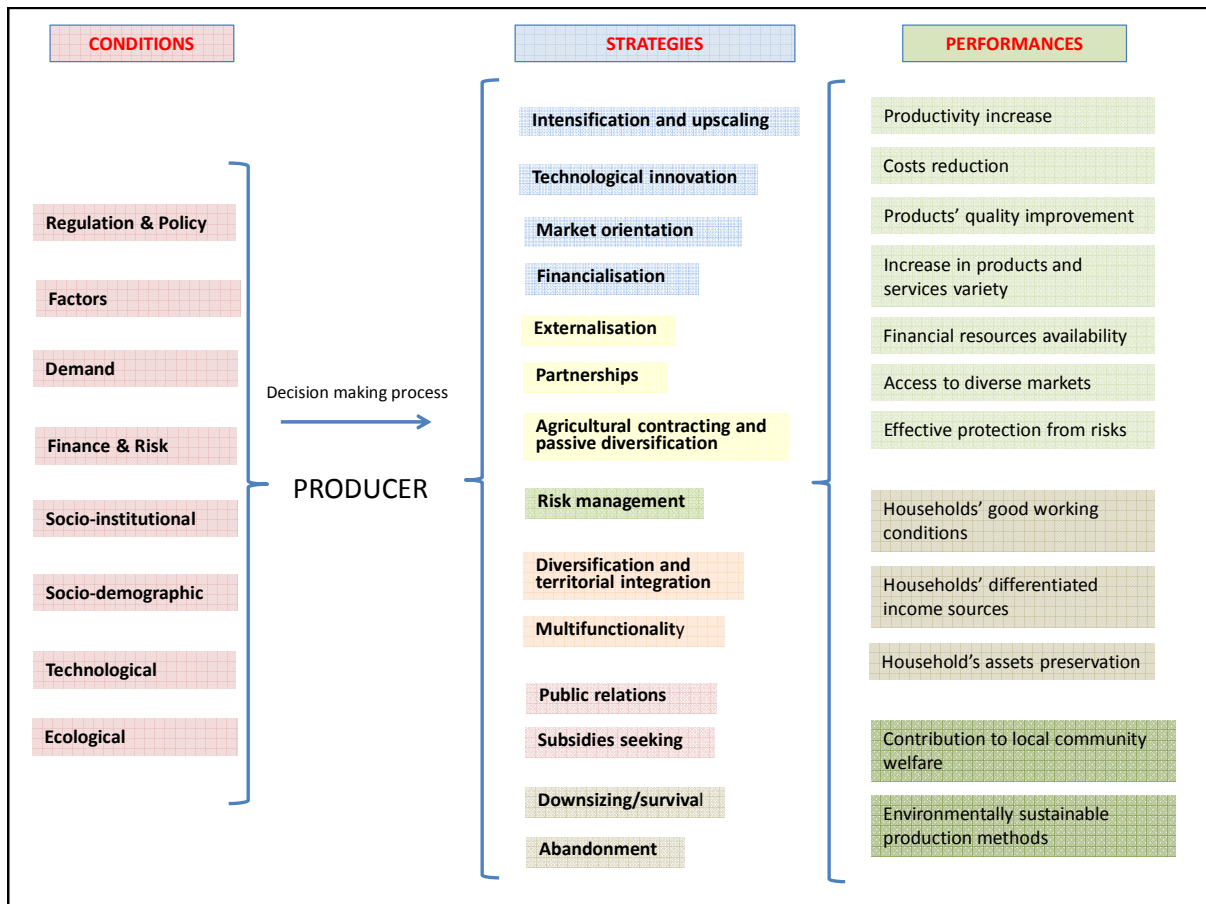


Figure 9: Conditions, strategies and performances

<sup>8</sup> Objectives and performances are conceptually different. Objectives are a key element of producers' decision making (alongside conditions, attitudes etc.) and strategy selection. Later, initial objectives (as long as they are still relevant for the producer) become a benchmark for the producer to evaluate performances.

Performances have been indicatively clustered into three groups: in light green the most business-oriented; in light gray the most household welfare-oriented; in dark green the outward-oriented ones, represented by the social and ecological goals (e.g., community involvement, local biodiversity preservation, animal welfare). These last two performances evidence the nature of the farm as a socio-ecological system and reflect societal expectations about farms and farming. They can be pursued by producers willing to meet these expectations *per se*, but also as a way to achieve other objectives: the business-oriented (when they become a marketing lever), and the household-oriented performances (when they contribute to improving family welfare).

At this point of the analysis of the CSP approach, it is worth underlining that we are not dealing with unidirectional processes. The representation provided in Figure 9 can be considered, roughly speaking, as a collection of inventories displayed in chronological order. A number of studies, developed between the 1970s and 80s, demonstrated that these kinds of frames need to be further specified with feedback loops between the three main elements. This is important, since the outcomes of a firm's action influence its internal conditions and the characteristics of its context (Porter, 1980; Porter, 1981; Salop, 1979; Schmalensee, 1978; Spence, 1979; Caves et al., 1980).

Figure 10 accounts for the feedbacks and suggests the interactive and iterative processes producers are involved in. Such processes occur in constant co-evolution with their ecological, social, economic and institutional context. The influence of external conditions on the step from strategies to performances is also highlighted. Equally relevant, yet not shown in the Figure, are the interrelations among the various conditions (e.g., regulation and socio-demographic conditions influence many of the others), strategies (synergies, complementarities, clashes...) and performances. Feedback loops must be considered both for the producer itself which undertakes the strategy (e.g., technological look-in), and with regard to other producers which may profit, or be hampered, by its actions. Examples of the latter include the availability of opportunities for externalisation due to other producers' specialisation, the possibility to profit of agglomeration economies and the saturation of innovative markets by more rapid competitors).

These effects can also be consciously pursued by the producer. As argued by Porter (1991) firms have considerable latitude not only in responding to the context, but also in influencing it. Creating the conditions in which some strategies can be effective is, in itself, a goal to be pursued. An easy example is farm re-location, which can be seen as a strategy aimed at achieving better conditions.

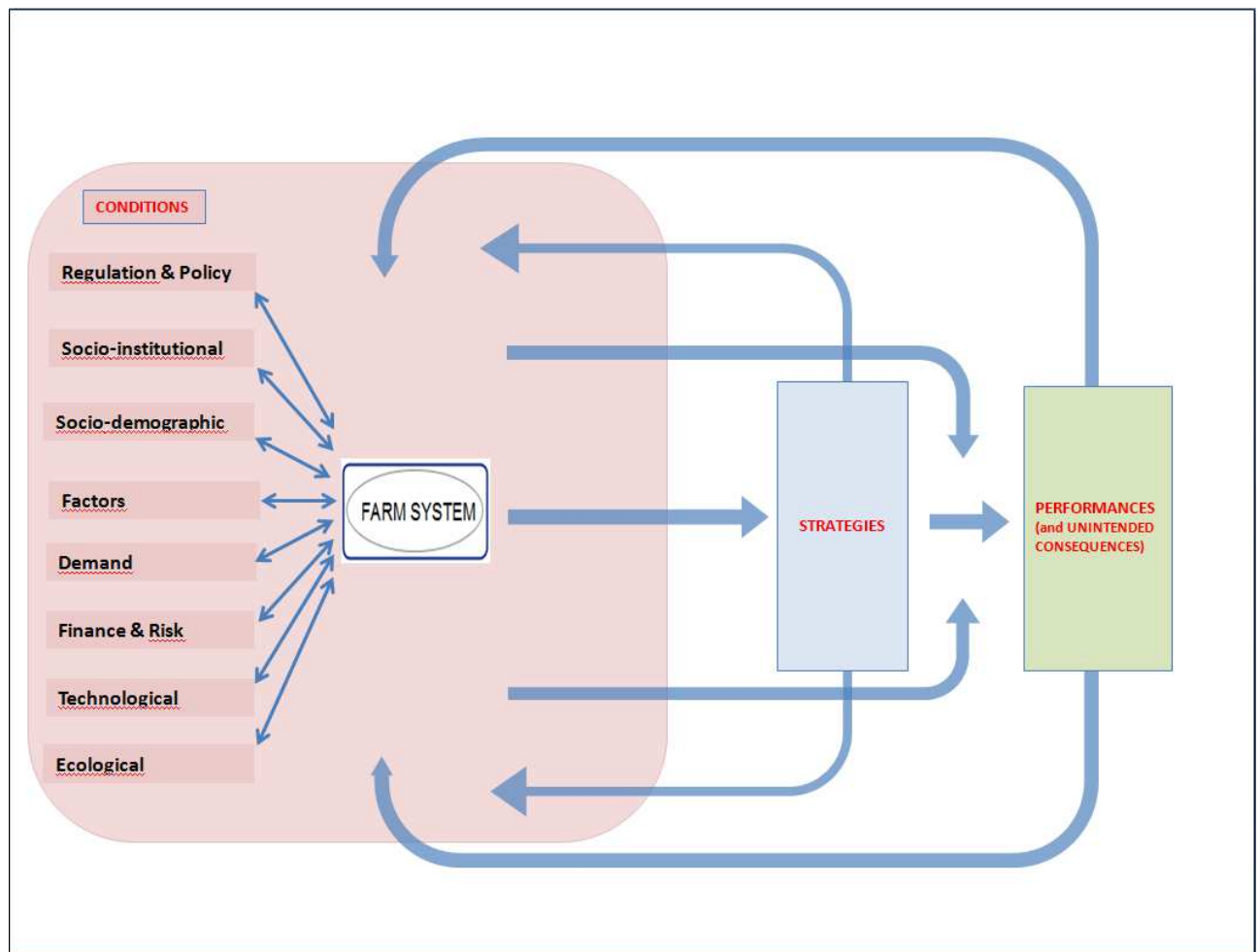


Figure 10: Conditions, strategies, performances and feedbacks

#### 4.2 Performances and farm resilience

Resilience is a key category in the analysis of a producer's sustainability. This is especially relevant in a context characterised by many stresses and shocks. Performances and resilience can be linked as shown in Figure 11.

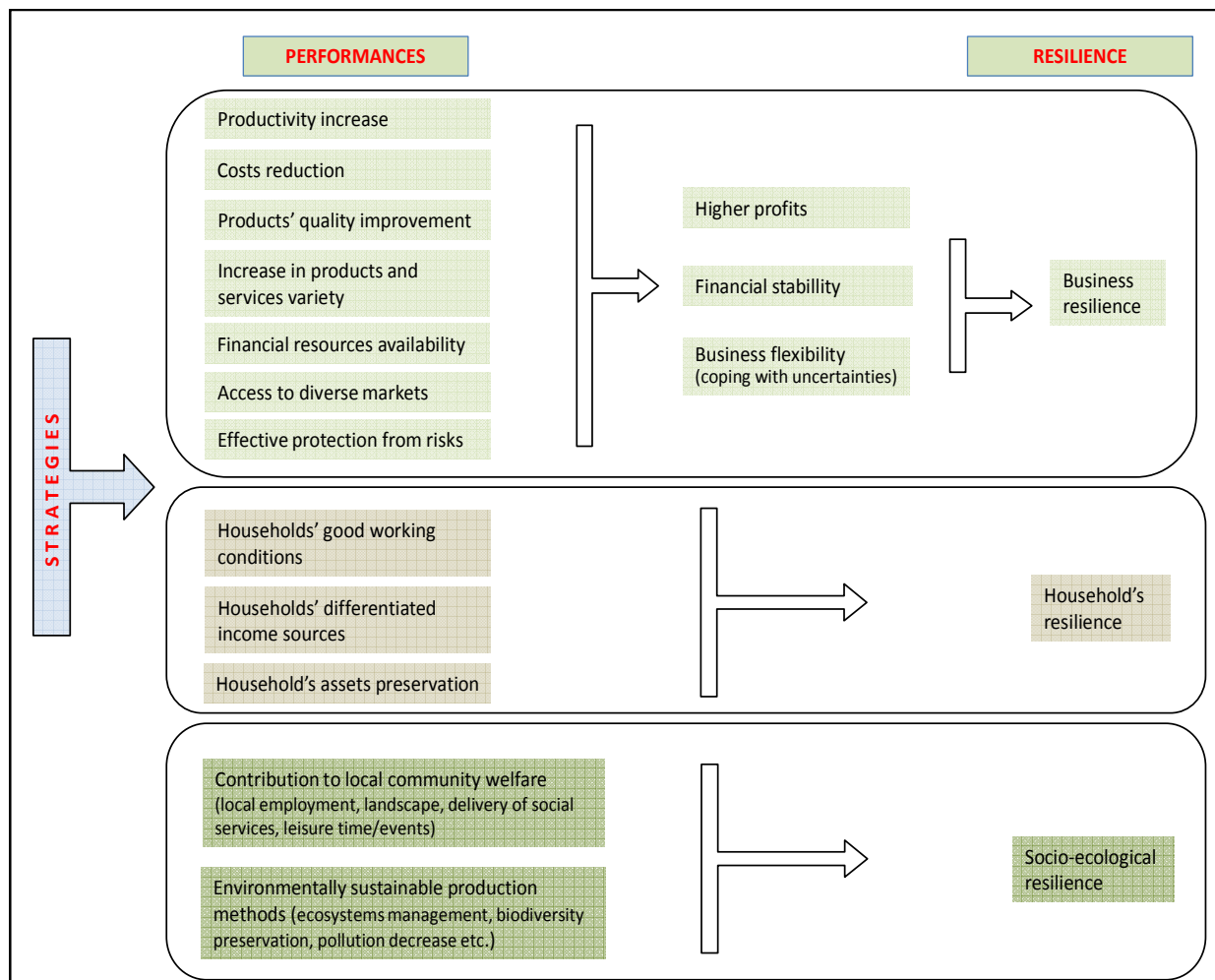


Figure 11: Performances and resilience dimensions

The relation between producer strategies (and related performances) and resilience requires some further reflection. Not all strategies aim at increasing resilience. This is only partially related to the fact that resilience is quite a new and theoretical concept and thus may be unknown to many producers, who could therefore hardly consider it as their explicit or conscious objective. Many strategies, though not formulated in resilience terms, do aim directly or indirectly at increasing a producer's capability to cope with unpredictable events, and to adapt to them. Examples of these include risk-sharing contracts, markets diversification and household incomes diversification. Even considering this, not all the strategies discussed – when successfully carried out – result in resilience-increasing performances. Some strategies may be focused on short-term specific objectives that may even result in lower resilience levels in the long run. Examples of such objectives include profit maximisation (Hoddbod and Eakin, 2015) or increasing household welfare. Besides, in some cases the search for long-term resilience can lead to losses and inefficiencies, and trade-offs are possible between managing for

overall system resilience and for reduced vulnerability of specific system components (Hodbod and Eakin, 2015).

If we regard resilience as an element of long-term sustainability, it is worth focusing the analysis on those performances which lead to more resilience. In other words, strategies and performances can be analysed in the light of a resilience approach, to understand if, how and to which extent they facilitate producers to become more capable to cope with disturbances.

This is the meaning of Figure 11, where performances are put in relation to their final outcomes in terms of resilience (in two cases through more general intermediate outcomes). Three resilience dimensions were identified:

- business resilience: producers' capability to cope with economic and financial disturbances;
- household resilience: households' capability to cope with farm business uncertainties and adverse situations;
- socio-ecological resilience: capability of the producer, conceptualised as a socio-ecological system, to develop in conditions of resilience while keeping social and natural capital at least constant, and contributing to strengthen the resilience of the specific social and ecological systems in which the producer is embedded.

The concept of socio-ecological resilience can be enriched by the analysis conducted by Darnhofer et al. (2010) who group farm strategies based on the four clusters of factors relevant for building resilience in social-ecological systems, according to Folke et al. (2003) and Berkes (2007): (1) learning to live with change and uncertainty, (2) nurturing diversity in its various forms, (3) combining different types of knowledge and learning and (4) creating opportunity for self-organization and cross-scale linkages. These factors were then reinterpreted to match the specificities of family farming when it is considered as a social-ecological system (Darnhofer et al., 2010).

## 5. Concluding remarks

Primary producers face a wide range of market and regulatory conditions—including market imperfections—across Europe, but these conditions vary considerably across products and regions. There is no single marketing strategy to address these market and regulatory conditions in these different contexts. Rather, a variety of institutional arrangements exists, at least in theory. Such institutional arrangements may combine horizontal cooperation strategies between producers with vertical coordination strategies along the supply chain and public interventions regulating or facilitating these strategies. However, in practice, not all institutional arrangements may be available to primary producers, due to the lack of an appropriate institutional framework and the lack of trust among producers or among supply chain actors.

The role of government is complex, having to balance between societal welfare on the one hand and protection of producers on the other. Increased requirements from society with respect to sustainability are translated into public regulation and lead to higher costs for producers, but these are counterbalanced by institutional mechanisms that aim to reduce these new costs, such as the direct payments from the EU's Common Agricultural Policy (CAP). In addition, the emergence of new institutional arrangements calls for a rethinking of public policy, as is already evident in the regulation of producer organisations, branch organisations, unfair trading practices, etc.

More specifically, institutional arrangements may induce thinner and hence more volatile spot markets, which may increase risk for farmers not benefiting from contracts. Moreover, the share of the market where the price is unknown may increase and hence induces less transparent price formation and information. Vertical coordination may thus rise information and negotiation costs for the farmer. Indeed, because long-term contractual obligations constrain farmer's future choices, engaging in one of these relationships means seriously comparing it with other potential alternatives. Further producers may face adjustment costs resulting from the investment in very specific assets when entering institutional arrangements. The requirement for sophisticated production skills and capital constitutes a barrier to entry for some producers. It is likely that processors and retailers will concentrate their contracts on a small group of producers in order to limit transaction costs. Therefore, an important role for government is to build and strengthen enabling frameworks for institutional arrangements to emerge, last and be beneficial for all supply chain actors, which implies also strengthening producers' skill base and participation rate.

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