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Food4Sustainability: conceptual framework –

1. Presentation of the study

Food retail corporations and fast food chains are powerful actors of the dominant food system. They exert strong locking effects that hinder the transition towards more sustainable food systems. This occurs through the criteria they impose to the upstream part of the food chain (e.g., the use of standards, volume requirements), and through their products offering, which make sustainable food products lowly available for consumers.

Over the last few years, several initiatives involving these corporations have emerged in Belgium, such as the introduction of local products in supermarkets, and the emergence of new types of fast food chains, the so-called ‘healthy fast-casual’ chains proposing healthier dietary patterns for eating on the go, potentially contributing to a transition towards more sustainable food systems. Exploratory field work has shown that these processes are dynamic and involve a variety of actors: healthy fast casual chains can have strong interactions with organisation from civil society, and retail corporations sometimes work together with local private initiatives and/or local authorities.

In this second stage of the F4S project, we examine to which extent the emergence of new healthy fast-casual food chains and the development of local sourcing in supermarkets can contribute towards a sustainability transition in the food sector. We thus address the following research question:

Are interactions between retail corporations and local initiatives or between healthy fast-casual food chains and organisation from civil society contributing to changes in practices and values within the organisations? Could it potentially induce a deep transformation of the dominant food system, and if so, how? Is the introduction of local products on these corporations’ sourcing an opportunity for profound change (i.e. for alternative farming practices and social and solidarity economy practices to scale up) or does it rather reinforce the lock-in of the dominant system?

This question is investigated through the analysis of seven case studies:

- **Four initiatives** of local food provision in Belgium (Promogest, Hainaut Développement, Made-in-BW, Puur Limburg, Pajottenland) and their interactions with the three main retail corporations in Belgium (Carrefour, Delhaize and Colruyt)
- The case of a **healthy fast-casual** food chain and its interaction with organisations from civil society, but also with some of their suppliers that are involved in more sustainable ways of producing and processing food. .

2. Conceptual framework

2.1 Transition pathways

The overarching analytical framework for this study is inspired from the literature on sustainability transitions, and more particularly, it is based on the multilevel perspective (MLP). [*presentation of the MLP: def of transitions, def of the three levels*]. According to the MLP, transitions depend on interactions between three levels – landscape, regime and niche. In this study, all three levels will be taken into account, with a focus on regime-niche interactions.

The MLP has become a popular tool to analyze transitions towards sustainability. It has been used for a variety of historical case studies, which has allowed Geels and Schot (2007) to characterize different patterns and thus to build up a typology of transition pathways, based on variations of timing and the nature of multi-level interactions. This has led to the identification of four ideal type transition pathways (Geels and Schot, 2007; van Amstel, et al., 2012; Verbong and Geels, 2010). We will now first discuss the two different criteria. After that, we will discuss the four different transition pathways that are identified. Then we will see how this approach allows framing our study and rewording our research question.

2.1.1 Criteria

Timing

The timing of the landscape pressure with regard to the state of developments at the niche level is of particular importance for the course of transition pathways. If at the moment a landscape pressure occurs, a niche is not fully developed, there will be a different transition pathway than if the niche would have been fully developed (Geels and Schot, 2007; Verbong and Geels, 2010). Geels and Schot (2007) mention however that the stage of development of a niche is not objective, as niche and regime actors may have different perceptions.

Nature of interaction

The nature of interaction is of particular importance when classifying different transition pathways. What matters is the relationship between the three levels. This can be:

- Reinforcing or symbiotic and therefore have a stabilizing effect and form no driver for transitions;
- Disruptive and competitive and therefore exert pressure on the regime, fostering transition (Geels and Schot, 2007).

2.1.2 Typology of transition pathways

Based on the two criteria named above, four different transition pathways can be identified. These four pathways will be discussed below.

Null-state: Reproduction process

In a first place, a null-state is identified. In case there is no external landscape pressure, the regime will continue reproducing itself. Although niches may be present, there is little chance for them to break through (Geels and Schot, 2007).

Transformation pathway

In transformation pathways there is a disruptive landscape pressure. Criticism from outsiders (e.g. social movements, public opinion) is especially important, because it creates a pressure on regime actors to make changes. This usually involves conflict, contestation and power struggles. Niche innovations are not yet sufficiently developed to take advantage of the windows of opportunity created by this pressure. Regime actors therefore make use of niche innovations by picking up the lessons learned and incorporating them in the practices and routines of the existing regime. These symbiotic niche-innovations thus add to the regime and do not disrupt its basic architecture. Regime actors survive the disruptions although some changes may occur in social networks (Geels and Schot, 2007; van Amstel, et al., 2012; Verbong and Geels, 2010).

Reconfiguration pathway

The reconfiguration pathway strongly resembles the transformation pathway. External landscape pressures challenge the regime. In this pathway, however, niches are more developed. In a first instance, regime actors are driven by economic considerations to adopt add-ons or components from innovative niches to solve local problems in the regime, while leaving the basic architecture of the regime unchanged (Geels and Schot, 2007). Yet, the difference with the transformation pathway is that these add-ons trigger further change and therefore impacting the regime's basic architecture. The new regime thus grows out of the old regime, changing the guiding principles, beliefs, practices, social relationships and networks that are connected to the old regime (van Amstel, et al., 2012; Verbong and Geels, 2010). Geels and Schot (2007) argue that the reconfiguration pathway is especially applicable to distributed sociotechnical systems that function through the interplay of multiple technologies (e.g. agriculture, hospitals, retailing).

Technological substitution

In the pathway of technological substitution there is a strong landscape pressure that occurs on the dominant socio-technical regime at a moment where a niche is strongly developed. In this case the disruptive pressure creates a window of opportunity for the niche to break through, serve increasingly larger markets and eventually replace the existing regime. The relationship between the niche and the regime is thus competitive in this case. This pathway, then, leads to the fall of incumbent regimes.

De-alignment and re-alignment

In the pathway of de-alignment and re-alignment, strong pressures lead to major problems in the existing regime, which may cause regime actors to lose faith. This leads to the collapse of the regime (its de-alignment). However, there is no niche-innovation that is sufficiently developed to be a clear substitute, leaving a vacuum. This, together with the lack of stable

rules, leads to the rise of multiple niche innovations and widespread experimentation followed by a long period of co-existence and uncertainty. In the long run, one innovation gains momentum and becomes the new dominant regime. Leading to the re-alignment and the re-institutionalization of a new socio-technical regime (Geels and Schot, 2007; van Amstel, et al., 2012; Verbong and Geels, 2010)

The Table 1 below summarizes the characteristics of each of the four transition pathways of Geel and Schot’s typology:

Transition pathways	Main actors	Type of (inter)actions	Key words
1. Transformation	Regime actors and outside groups (social movements)	Outsiders voice criticism. Incumbent actors adjust regime rules (goals, guiding principles, search heuristics)	Outside pressure, institutional power struggles, negotiations, adjustment of regime rules
2. Technological substitution	Incumbent firms versus new firms	Newcomers develop novelties, which compete with regime technologies	Market competition and power struggles between old and new firms
3. Reconfiguration	Regime actors and suppliers	Regime actors adopt component-innovations, developed by new suppliers. Competition between old and new suppliers	Cumulative component changes, because of economic and functional reasons. Followed by new combinations, changing interpretations and new practices
4. De-alignment and re-alignment	New niche actors	Changes in deep structures create strong pressure on regime. Incumbents lose faith and legitimacy. Followed by emergence of <i>multiple</i> novelties. New entrants compete for resources, attention and legitimacy. Eventually one novelty wins, leading to restabilisation of regime	Erosion and collapse, multiple novelties, prolonged uncertainty and changing interpretations, new winner and restabilisation

Figure 1: Main actors and (inter)actions in transition pathways (Geels and Schot, 2007, p. 414)

It should be stressed that these pathways are proposed as ideal types. In reality, a case may have elements of more than one pathway. Moreover, if researched over a longer period of time, a sequence of different transition pathways may occur (Verbong and Geels, 2010). Van Amstel et al. (2012) argue that until now the typology has only been used to analyze long term historical processes. They justly pose the question whether these ideal types could be used as scenarios for change in the context of current transition dynamics in order to accelerate and guide transition processes.

2.1.3 Application to F4S phase II

Regarding the cases we investigate in the second phase of Food4Sustainability, the potential transition pathways are likely to be the transformation and reconfiguration. Another possibility we do not exclude is that the on-going process is not a transition but a reproduction process. The core question is to analyze whether the cases we study contribute triggering a profound change in the basic architecture of the regime (i.e. a transition), or whether they are rather add-ons to the incumbent regime without changing its basic architecture (i.e. they contribute to a reproduction process: innovation does exist but it does not lead to a deep transformation of the dominant system).

Our main research question can then be divided into two main guiding questions:

What are the outcomes of such niche-regime interactions? Can these interactions lead to a regime change either by influencing the strategies and practices of retailers and new healthy fast-casual chains, and/or by helping scaling up the local initiatives?

The aim is to assess the impacts of these interactions on the retail corporations' and **healthy fast-casual** chains' strategies and practices, and to evaluate whether these impacts are rule changing or not. In other words, whether they induce marginal adjustments of the corporations' strategies and practices, or whether they trigger deep changes at the regime level (i.e. on the strategies and practices of all the actors of the food system).

According to the MLP, food provisioning, as all societal functions, is fulfilled by a sociotechnical system (Geels, 2002), composed of an heterogeneous set of elements such as farming practices, distribution networks, regulations, markets, consumers' preferences and consuming patterns, public policies, beliefs and symbolic meanings. This set of elements is heterogeneous but in reality it aggregates two subsets, which can be covered by the notions of practices and values. In order to analyse the evolution of the agri-food system and to answer the above question, we adopt three different strands of analysis:

- The way in which the practices of the retail corporations and of the actors involved in the local initiatives influence and are influenced by these interactions;
- The way in which the values (i.e. beliefs, motivations and strategies) of the actors involved influence and are influenced by these interactions;
- The learning processes facilitating these evolutions.

The following sections will present more into detail each one of these strands.

2.2 Practices

In order to characterize the practices of the various actors of the food system, we use the marketing system approach [ref?], with some adjustments.

The marketing system approach considers nine different categories that together constitute the marketing process. The different functions are: buying, selling, storing, transportation, processing, standardization, financing, risk bearing, and marketing intelligence. In their turn, these categories can be sub-divided in three groups: exchange, physical and facilitating functions. Each of these functions incurs costs and therefore adds value to the end-product. Beierlein et al. (2008) note that each of them is meant to overcome a particular barrier towards consumer satisfaction (Crawford, 2006; Beierlein, et al., 2008).

Function		Explanation
A. Exchange functions	Buying	Overcome separation of ownership. The seller offers a product that is wanted by the buyer, and exchanges something in return. In this way, the legal title of the product is transferred from buyer to seller.
	Selling	
B. Physical functions	Storing	Overcomes separation of time. As agricultural products are seasonal, storage can balance supply and demand by smoothening supply throughout the year and keeping the produce in good condition between production and final sale.
	Transportation	Overcomes separation of space. Makes the product available there where it is needed.
	Processing	Overcomes value separation. Processing is a form changing activity meant to increase the utility for the consumer and thereby increasing the value.
C. Facilitating Functions: those functions that make systems work more efficiently	Standardization	Overcomes information separation. Establishes and maintains uniform measurements for quality and quantity. It simplifies buying and selling and reduces marketing costs.
	Financing	Overcomes value, time and space separation. Is meant to bridge the time between the buying of the raw material, producing, processing, storing and transportation and receiving the payment for selling by providing the funds needed for these actions
	Risk bearing	Overcomes time separation. Risk bearing assumes physical (e.g. fire, pests and floods) and market risks (e.g. changes in values or consumer tastes) by assuming the physical and price risks between purchase and sale. Overcome by creating surplus in earlier stages, or borne by organizations and companies.
	Marketing 9. Intelligence	Overcomes information separation. Reduces the level of risk in decision making by collecting, interpreting and disseminating information on prices, inventory levels, embargoes and other incidents that may influence the buying and selling of products.

Table 2: The marketing functions explained (Beierlein, Schneeberger, and Osburn, 2008; Crawford, 2006)

As afore mentioned, the core issue addressed by this study is whether and, if so, how the agri-food system is evolving, both at local and macro levels, as a result of the interactions between food retailers and local initiatives, and between **healthy fast-casual** chains and organisation from civil society. This implies analysing not only the way the marketing process is impacted (i.e. how and by whom the nine functions are fulfilled, and it's relative importance), but also:

- Analysing how other business functions are impacted (e.g. innovation and marketing);
- Taking into account a broader set of actors (all the actors involved, not only upstream actors) and their practices (e.g. public authorities and their policies, consumers and their consumption patterns, extension ASBLs and their activities).

Therefore, we suggest enlarging the way the marketing functions approach frames the question, by integrating into the scope of analysis:

- Additional functions: R&D, communication/marketing, internal organisation, partnership management/coordination practices;

- All the actors directly and indirectly involved in the initiatives: retail companies, local authorities, farmers, project holders, consumers, NGOs and other partners when appropriate.

Moreover, we propose broader definitions of the functions, in order to go beyond the specific way in which such functions are fulfilled in the conventional food system. For instance, in a narrow definition, "standardization" is only one way to ensure that products are in conformity with a number of technical criteria; the building of relationships on the basis of trust between producers and consumers, as seen in direct producer-to-consumer schemes, is another tool that can fulfil the very same function. Similarly, "market intelligence" is a tool adopted by retailers and processors of the mainstream system to monitor market conditions; in alternative food systems, actors receive feedback through other, mostly informal channels, such as shared governance and/or direct interactions with the other food-chain actors. Therefore, one of the stakes of this research will be to understand how the various functions outlined can be fulfilled differently.

The definitions of the functions also need to be enlarged to better capture the diversity of values and motivations. The analysis should not only deal with "how and by whom are the nine functions fulfilled", it should also take into account:

- How the different actors define the functions (i.e. what is the purpose of each activity according to each actor). For instance, according to the marketing system approach, processing is "meant to increase the utility for the consumer and thereby increase the value" (Beierlein et al., 2008), whereas in alternative food systems processing is sometimes meant to allow the valuation of products that would otherwise be spoiled;
- How the different actors see their own role and the role of the other actors in the food system (i.e., according to the actors: what are the relevant actors to be involved in the definition of the functions and what actors should define how they need to be fulfilled). For instance, according to the marketing system approach, financing is "meant to bridge the time between the buying of the raw material, producing, processing, storing and transportation and receiving the payment" (Beierlein et al., 2008), whereas in some cases local authorities decide funding local initiatives because they have a public utility purpose and support salaries or investments. In those cases, financing is a way for local authorities to help restructuring the market.

In order to capture the variety of actual motivations and values, these refinements will be made depending on how the studied actors actually define the various functions (i.e. the purpose they give to these activities), their own role and the role of the other actors in the food system. In this perspective, talking about "activities" rather than "functions" would be more appropriate.

In the next section, we will have a more in-depth look at how values will be characterized and classified.

2.3 Values

In the literature, the notion of value is mostly tackled at the individual level.

Values are about what is important for people in their lives, what they will be striving for. Life goals share much conceptual overlap with values and help understanding what people's aims are and how they organise their lives to reach these goals. Schwartz (1992; 2006) defines six main features for values: they are beliefs that are linked to affect; they point at desirable life goals; they transcend specific contexts (and differ in that from norms and attitudes that are usually linked to specific situations); they serve as guiding principles; they are prioritised differently from one individual to another; and, finally, it is their relative importance that will guide action.

Values and life goals are based as well on internal psychological needs and drives, as on external social models and people experience in life. However, different studies in the field converge to the conclusion that there are only around a dozen values/life goals that are shared by people across the world (Sheldon et al., 2011; Grouzet et al., 2005; Schwartz, 1992). Besides, cross-cultural research shows that the organisation of those values is highly consistent across different cultures.

2.3.1 Intrinsic and extrinsic values and goals

In line with self-determination theory, life goals can be differentiated between intrinsic and extrinsic pursuits. According to Grouzet et al. (2005), **self-acceptance, affiliation, community feeling, and physical health** are common **intrinsic** goals. They are related to the psychological needs for relatedness, autonomy, and competence, as explained in self-determination theory (Deci and Ryan, 2000; Ryan and Deci, 2000).

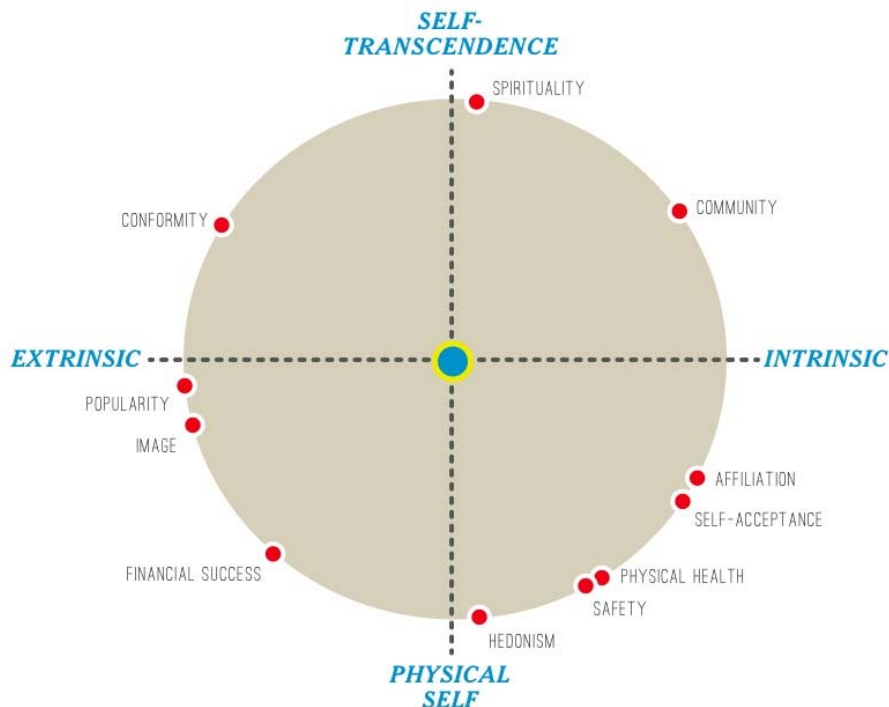
Financial success, image, and popularity form typical **extrinsic** goals aiming at obtaining some external reward or social praise. The search for **power** and **achievement** mentioned by Schwartz (1992, 2006) can also be related to the same category of extrinsic goals.

Other dimensions are also used in the literature to structure the organisation of values, such as the Theory of Value Content and Structure (Schwartz, 1992, 2006). In the Theory of Value, prominent dimensions are 'openness to change' (hedonism stimulation, self-direction) versus 'conservation' (security, conformity, tradition) and 'self-enhancement' (achievement, power) versus 'self-transcendence' (universalism, benevolence).

Echoing Schwartz's work, Grouzet et al. (2005) deepened their understanding of life goals by seeking for another fundamental dimension that would complement the intrinsic - extrinsic axis. To this effect, they explored the self-transcendent versus physical dimension. They considered 11 life goals in total to provide a more complete taxonomy of human values (Table 3).

Table 3 Goal Contents, Descriptions, and Sample Items (in Grouzet et al., 2005: 802).

Goal contents	Description	Sample items
Affiliation	To have satisfying relationships with family and friends	"I will have a committed, intimate relationship."
Community feeling	To improve the world through activism or generativity	"I will assist people who need it, asking nothing in return."
Conformity	To fit in with other people	"I will live up to the expectations of my society."
Financial success	To be wealthy and materially successful	"I will be financially successful."
Hedonism	To experience much sensual pleasure	"I will experience a great deal of sensual pleasure."
Image	To look attractive in terms of body and clothing	"My image will be one others find appealing."
Physical health	To feel healthy and free of illness	"I will be physically healthy."
Popularity	To be famous, well-known, and admired	"I will be admired by many people."
Safety	To ensure bodily integrity and safety	"I will have few threats to my personal safety."
Self-acceptance	To feel competent and autonomous	"I will have insight into why I do the things I do."
Spirituality	To search for spiritual or religious understanding	"I will find religious or spiritual beliefs that help me make sense of the world."



Richard Morin/Solutions (Source: Grouzet et al., 2005)

Figure 1: This circumplex model is based on circular stochastic modeling procedures applied to the goal-importance ratings of approximately 1800 college students in 15 cultures. Values adjacent to each other on the circumplex are experienced as relatively compatible whereas values on opposite sides of the circumplex are experienced as in relative conflict.

The validity of the first dimension of intrinsic vs. extrinsic goals is confirmed by the analysis. Goals in the intrinsic cluster (community, affiliation, self-acceptance, physical health and safety) are highly consistent with each other and strongly opposed to goals in the extrinsic cluster (financial success, image, popularity and conformity).

The second dimension of caring for one's physical self (safety and health, bodily pleasures and hedonism, financial success as a material means to achieve those ends) vs. looking for dimensions that transcend the self (benefitting society, taking future generations into account, seeking universal meaning and understanding, as well as matching society's desires) demonstrated that the goals were in opposition, but the clusters were not as internally consistent as the intrinsic vs. extrinsic ones.

However, even if the distinction between intrinsic vs. extrinsic types of goals has proven to be more robust, this second dimension remains valid and allows to differentiate within the clusters of intrinsic and extrinsic goals the priority given to physical self or self-transcendent aims.

2.3.2 Intrinsic/extrinsic values and the environment

This distinction established between intrinsic and extrinsic life goals provides thus a fundamental dimension to understand how people's minds are structured. Besides, intrinsic values and life goals are in opposition to extrinsic ones. This means that people are going to give priority either to extrinsic life pursuits such as money, power, image or status; or to intrinsic goals such as having close interpersonal relationships (affiliation), growing as a person, and helping one's community. Not only is it difficult to pursue both extrinsic and intrinsic goals at the same time but also going for one set of values tends to diminish the importance of the opposing set of values. Besides, what is so important with values and life goals is that they determine much of people's attitudes and behaviours. They are at the root of what people do (or don't do) and provide insights on their underlying pursuits.

Going for extrinsic or, on the contrary, intrinsic values and goals influences social and environmental behaviour and attitudes.

In particular, extrinsic values and goals are associated with less pro-environmental attitudes and behaviours (see, for instance Sheldon et al., 2011; Brown and Kasser, 2005; Saunders and Munro, 2000). As explained in Sheldon et al. (2011: 98):

“(...) studies document that a strong priority placed on money, power, and status is associated with caring less about the environment, engaging in fewer environmentally beneficial behaviors, and having higher EFs [ecological footprints] (...).”

Conversely, giving priority to intrinsic values and life goals is associated to more positive attitudes and behaviours towards the environment (Sheldon et al., 2011; Brown and Kasser, 2005; Schultz et al., 2005).

This has important implications as current approaches to promote sustainability and the protection of the environment often trigger extrinsic life goals related to financial savings,

status, image, profit and economic growth. As such, beyond the win-win effects those approaches might bring on the short term, they might, in fact, be encouraging the life goals that are detrimental to more sustainable behaviours. On top of that, priming extrinsic values causes intrinsic values to be relatively suppressed, which, in turn, could well be undermining the very set of life goals at the root of more sustainable behaviours.

Sheldon et al. (2011:103) come thus to the conclusion that:

“(…) when teaching students about environmental problems, curricula should probably avoid focusing on how particular solutions might save money (extrinsic values), and instead connect these solutions with how they will benefit the community (intrinsic values; see, e.g. Vansteenkiste et al., 2004). Similarly, as environmental campaigners and politicians reach out to citizens, these data suggest that it is better to focus on how sustainability policies might help benefit one’s family and future generations rather than how they will help the economy grow.

2.3.3 Connectedness with nature

Social identity is also an important aspect of a person’s identity. By defining their social identity in terms of gender, race, etc. but also by what they like (music, sports, etc.), their political ideas, and many other aspects, people create the feeling of belonging to what is called an *in-group*. In turn, this creates the sense of an *out-group*, with others that do not share the same characteristics.

As nature is, to some extent, included in the self, the state of the nature becomes related to the person’s own well-being. The strong correlation between connectedness with nature and pro-environmental behaviours has been established in the literature (Frantz et al., 2005; Mayer and Frantz, 2004; Schultz, 2001).

Conversely, when nature is an out-group, people see themselves as not being part of nature. In this anthropocentric perspective, there is no overlap between their own self and nature.

This concept that nature can be considered as an out-group with no connectedness to the individual self provides deep insights on why the destruction of other species and ecosystems can take place in relative indifference, let alone the suffering of animals.

These notions have thus major implications when seeking paths to sustainability. When materialistic and self-enhancement values are activated and promoted in people, when animals and nature are consistently presented as an outgroup, when there is a strong anthropocentric perspective, it is likely to move people away from more sustainable paths.

2.3.4 Implications for F4S phase II

The literature review on values shows that values have a fundamental role in shaping sustainable or unsustainable path. They are at the root of people’s life goals and actions. As we have seen, life goals can be organised in a circumplex fashion (Fig. 1) with clusters of goals being consistent with each other and opposed to others. The first dimension makes the

distinction between intrinsic goals (community, affiliation, self-acceptance, physical health and safety) and extrinsic goals (financial success, image, popularity and conformity). Goals in each cluster are highly consistent with each other and are strongly opposed to the other cluster. In most cases, an individual will thus prioritise either intrinsic or extrinsic life goals.

It has been established in the literature that this prioritisation of either intrinsic or extrinsic values has a strong correlation with environmental attitudes and behaviours. A strong priority placed on money, power, and status is associated with caring less about the environment. Conversely, when individuals prioritise intrinsic values and life goals, research shows that they have more pro-environmental attitudes and behaviours.

In the circumplex organisation of life goals, the second dimension covers caring for one's physical self (safety and health, bodily pleasures and hedonism, financial success as a material means to achieve those ends) vs. looking for dimensions that transcend the self (benefitting society, taking future generations into account, seeking universal meaning and understanding, as well as matching society's desires). When related to sustainability in food systems, this echoes the concept of environmental identity and connectedness with nature. As nature is, to some extent, included in the self, the state of the nature becomes related to the person's own well-being. Conversely, when nature is an out-group, people see themselves as not being part of nature. In this anthropocentric perspective, there is no overlap between their own self and nature.

This has important implications as priming extrinsic and anthropocentric values is linked to caring less about the environment and becoming more indifferent towards nature. But, most importantly, it also causes intrinsic values to be relatively suppressed, which, in turn, reinforces the dominance of extrinsic values even more and further undermines the very set of life goals at the root of more sustainable behaviours.

In line with the researchers in the field, we thus make the hypothesis that a change in values and life goals is necessary to orientate food systems on more sustainable paths. More specifically, this implies to stop priming materialistic, self-enhancing values and to encourage intrinsic and self-transcendent values as well as connectedness with nature.

2.4. Transitions, interactions and learning

As presented in section 2.1, socio-technical regimes are dominant and relatively stable configurations fulfilling key societal functions, encompassing both social and technical elements (Geels, 2002). Regimes are characterized by the alignment of different cognitive and normative elements, activities and processes, which we chose in this study to consider as two subsets: practices and values. However, another element should be taken into account: the regime's knowledge base, on which are built regimes' underlying assumptions, and which guides interpretations and actions of regime actors. The stability of a regime's assumptions "locks" regimes within path-dependent trajectories, implying that regime changes are rather incremental (Geels, 2004; Schot and Geels, 2007; Marques et al., 2012). Deep and broad changes in a socio-technical regime's knowledge base induces changes in practices and

values, as well as on problem definition and interpretation, and thus lead to a transformation into a different regime (Geels, 2004; Schot and Geels, 2007; Smith et al., 2005).

Such powerful changes are the outcome of learning and interactions of multiple developments at and between a regime and the two other levels that together constitute a socio-technical system – niches and landscape (Geels, 2004; Geels and Schot, 2007; Smith et al., 2010; Foxon et al., 2010; Marques et al., 2012). As studied in evolutionary economics, the development of new practices implies learning processes both on technical and social aspects. Similarly, as noted by Marques, van der Ploeg and Dal Soglio (2012:41), the development of new values and identities required for transitions to happen “involves multiple learning processes that can disrupt pre-existing commitments, roles and rules”.

The centrality of learning and interactions for sustainability transitions is reflected in the typology of transition pathways proposed by Geels and Schot (2007). As presented in section 2.1, this typology is based on the timing and nature of the interactions between the different levels, particularly niche-regime interactions. The timing dimension refers to the level of development and stabilisation of a niche innovation when interacting with the dominant socio-technical regime. A key indicator of the level of development of a niche innovation is whether a dominant design has been stabilised by learning processes (Geels and Schot, 2007; Marques et al., 2012).

Despite being at the heart of transition theory, interactive learning between different actors from the different levels is only vaguely defined and operationalised in most of the conceptual and empirical studies on sustainability transitions. Moreover, the great bulk of scholarly work on the topic focuses largely on learning dynamics at the niche level (Elzen and Barbier, 2012). However, as discussed above, powerful changes such as those implied by socio-technical transitions require multiple interactive learning processes at and between niche and regime levels. Thus, the aim of the present research will be to analyse whether the various interactions we investigate in our seven case studies impact the knowledge basis and the basic assumptions of the actors of the agri-food system (farmers, retailers, projects holders of local initiatives, local authorities, and consumers). Our approach aims to make a contribution to face this analytical challenge by using insights from the business management literature on organisational learning. The purpose is to identify and discuss aspects and dynamics of learning processes at organisational and inter-organisational level that can favour or hinder sustainability transitions in the context of niche-regime interactions.

The notions of organisational and inter-organisational learning are closely related to the very concept of knowledge, and are guided by the assumption that knowledge is at the core of organisations’ competitive advantage.

One important debate in the organisational learning literature is about knowledge and learning at levels of individuals and organisations. Learning theories assume that learning takes place in the human mind only, implying that knowledge is closely connected with human action (Holmqvist, 2003; Tsoukas and Vladimirou, 2005). Antal and Sobczak,

(2014:656) claim that “[i]ndividuals, with their competences, hopes, and fears are the agents of organisational learning”.

The acknowledgement that individual members are agents of the organisational learning process is related to another widely accepted assumption borrowed from epistemological studies that knowledge has a social level (Tsoukas and Vladimirou, 2005). Hence, organisational learning is considered as a collective process of knowledge creation through consensually processing and interpretation of information (Nevis et al., 1995; Tsoukas and Vladimirou, 2005). In other words, the key issue is to show “how individuals appropriate knowledge and expand their knowledge repertoires, and, on the other hand, how knowledge, in organized contexts, becomes organizational¹” (Tsoukas and Vladimirou, 2005:120).

2.4.1 Organisational knowledge, routines and memory

The definition of organisational knowledge departs from the broader epistemological discussion about what is knowledge and how it differs from information. Knowledge involves cognition and is closely connected with action; it presupposes “interpretations within a domain of action” (Tsoukas and Vladimirou, 2005). As afore mentioned, knowledge is created through a social and consensual (learning) process of information processing and interpretation (Nevis et al., 1995; Tsoukas and Vladimirou, 2005). Nevis et al. (1995:121) state that “[t]rue [organisational] knowledge is more than information; it includes the meaning or interpretation of the information, and a lot of intangibles such as the tacit knowledge of experienced people that is not well articulated but often determines collective organisational competence”.

In addition to tacit form mentioned in the citation above, there exist different ways to classify knowledge in general, and at the organisational level in particular (Frost, 2010).

Within the knowledge management field, the most important distinction is made between tacit and explicit knowledge (Frost, 2010). The concept of tacit knowledge was originally introduced by Polanyi (1966) to refer to a form of knowledge that is non-codified, intuitive, hard to defined, and largely based on experience (Frost, 2010). Hence, tacit knowledge “is often context dependent and personal in nature. It is hard to communicate and deeply rooted in action, commitment, and involvement” (Frost, 2010). Tacit knowledge includes cultural beliefs, values, attitudes, mental models; as well as skills, capabilities and expertise (Frost, 2010). Explicit knowledge, on its turn, is codified and formalized through, for example, documents, memos, notes and databases (Frost, 2010).

Organisational knowledge can be also distinguished based on its embeddedness; it can be embedded in products, processes, structures, artefacts, routines, practices, or organizational

¹ Tsoukas and Vladimirou (2005:120) define individual knowledge as “the individual capability to draw distinctions, within a domain of action, based on an appreciation of context or theory, or both” and organizational knowledge as “the capability members of an organization have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalizations whose application depends on historically evolved collective understandings.”

culture (mostly explicit knowledge), and embodied in organizational members' minds (mostly tacit knowledge) (Argote, 2013; Frost, 2010; Nevis et al., 1995).

Organisational learning implies that knowledge created through it stays within the organisation, even if individuals leave it (Levitt and March, 1988; Nevis et al., 1995). Knowledge and associated practices are encoded, integrated, recorded, stored, maintained, utilized and retrieved, so that they become institutionally available and can be generalised to new situations, despite the turnover of individual member and the passage of time (Levitt and March, 1988; Nevis et al., 1995) [footnote about the notion of routine].

2.4.1 Learning loops

[Of course inside an organisation and in a network of organisation such as a food system, learning processes are continuously occurring. From a learning perspective, transitions are radical changes in learning orientations of all the actors involved. Learning orientations are based on organisational culture, experience and core competences, and translated in values and practices, which reflect what is learnt, and where and how learning takes place (Nevis et al., 1995).

Presentation of the single loop learning, double loop learning and triple loop learning.

We propose to consider the agri-food system as an organisation – which implies that talking about governance is talking about power relations between the actors of the agri-food system). Our hypothesis is that 2LL and 3LL are needed for a transition to occur, as they are the processes through which values are impacted.

Link with the various practices implemented by the actors to fulfil the eleven functions => discrepancy between professed theory and theory in practice.

Link with intrinsic/extrinsic motivations.

In this 2nd phase of F4S, we'll investigate if such learning processes occur, and if and how they enable more sustainable food practices and agricultural practices to spread.

NB : forms of learning and outcomes may lead to longer-term change (Armitage et al, 2008), which is one limit of our study.]

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