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**“How can policy processes remove barriers to sustainable food systems in Europe?
Contributing to a policy framework for agri-food transitions”**

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Highlights

- Food policy integration is needed for a transition to sustainable food systems
- We develop a policy framework that links the policy cycle to transition theories
- The evolution of Food and Nutrition Security through the CAP cycles is analysed
- A map of food-related policy instruments is developed to assess synergies and gaps
- Effective food policy needs to be system-oriented and knowledge-integrated

Abstract

A new food policy coherent with the goal of achieving sustainable food systems implies changing visions and radically revising the understanding of the system on which agricultural and food-related policies act. This paper identifies and discusses the policy processes that contribute to sustainable food systems in Europe. Based on a conceptual framework that links the policy cycle approach to transition theories, we (i) assess the evolution of policy cycles of the Common Agricultural Policy (CAP) to highlight how the food and nutrition concepts have evolved and have been reframed throughout five phases of the CAP, (ii) map and classify available policy instruments to assess potential synergies and gaps in view of a reorganization and (iii) indicate and discuss strategic tools for sustainable food policies. This contribution goes beyond the current literature by highlighting the obstacles which hinder the transition to a policy regime that embodies the nexus among food and nutrition security, natural capital preservation and climatic and social justice, and proposes new avenues for food policy studies.

Keywords:

Common Agricultural Policy; Policy reform; Sustainable Development Goals; Food and Nutrition Security; Sustainability; Transition; Policy cycles.

1. Introduction

The challenges of policy integration are increasingly being discussed by academics in view of developing better responses to cross-cutting societal challenges, such as climate change, political insecurity, market instability, food security (Howlett and Rayner, 2007; Weber and Rohrer, 2012; Candel and Biesbroek, 2016; Nilsson et al. 2016; Biesbroek and Candel, 2019)¹. Integrative approaches to address policy coordination failures are attracting the interest of institutional and societal voices, also in the agriculture and food sectors (European Commission, 2018a; IPES Food, 2019;).

Historically, the process of policy integration in the agriculture and food sectors has been slow and, to some extent, contradictory, and several analysts have highlighted the incoherence between different policy domains related to these sectors (Matthews, 2008; Brooks, 2014; Candel and Biesbroek, 2016). Whereas policy integration in environmental and rural domains has started almost thirty years ago (Feindt, 2010; OECD, 2016a), new challenges concerning food and nutrition security and evolving priorities –as set out by Sustainable Development Goals (SDGs)– require further integration (Pe'er et al. 2019). Despite being the main core of SDG 2, the concept of food and nutrition security² -broader than the stability of production and supply at macro-levels— is not fully embodied into the current agricultural and innovation policies' framework (Candel et al. 2014). For instance, a

¹ Since the seminal work by Weber and Rohrer (2012) on policy failures in the context of transformative change, a growing literature discusses solutions for improving the transformative potential of policies, through participatory agenda-setting for common visions (Kugelberg et al., in press) and integrative policy responses (Candel and Biesbroek, 2016). Emerging literature on mission-oriented policy (Mazzucato 2018), new policy paradigms (Diercks et al. 2019) and emerging frames for policy mix (Flanagan et al. 2011) advocate for a substantial break with the past, claiming the creation of a 'marketplace for ideas', as a space to identify and discuss contradictory views and preferences among groups and stakeholders (Hall et al. 2014) to better focus the societal policy agenda identifying potential policy gaps (Diercks et al. 2019).

² The multiple attempts to define food security have found in the one developed by FAO (2002) the widely shared definition, which reads as: “Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. As such, food security is a matter related to physical and economic access to sufficient and nutritious food (Sen, 1981; Bhattacharya et al. 2004) which is also adequately utilised and culturally acceptable.

growing evidence on the “triple burden of malnutrition” and food-related non-communicable diseases points to the influence that the food system has on consumer behaviour (Gómez et al. 2013; Walls et al., 2016), and calls for integration between public health and food policies. Or the attention to food waste along the supply chain and at consumption level reveals that an exclusive or prevalent focus of agricultural policies on production could be misleading (HLPE, 2014).

The debate on food-related policies integration spans multiple domains beyond health and agriculture, including environmental, social, ethical, economic dimensions, and opens a range of potential policy pathways (Brunori et al. 2016; Smith et al. 2016). A recent report by renown scientists claims that one of the new challenges is to achieve healthy and sustainable diets for all within planet boundaries, which implies integration of agriculture, health, and environment policies (Willet et al., 2019), in the awareness that policy integration is a political process in itself (Candel, 2019).

Given its financial relevance, the Common Agricultural Policy (CAP) is the policy which catalyses the attention on its effectiveness in achieving societal demands (Ecorys, 2017). Historically, the CAP has undergone more or less radical reforms, while dealing with unexpected outcomes (Pe'er et al. 2019). The gap between expectations and outcomes of reforming efforts is not only the effect of political weakness of the reformers (Lusk, 2017) rather, it is a sign of the complexity of such an endeavour. This paper is an attempt to identify and conceptualize the key aspects of this endeavour: we will address the reform of food related policies as a social, economic and technological transition problem. Transitions (Geels, 2004; Markard et al., 2012; Silva and Stocker, 2018, p. 61) are processes that bring to ‘transformational’ change by empowering ‘change agents’, making new paradigms and coalitions emerge, consolidate or replace the incumbent ones. Setting up an effective reform

starts by encouraging actors of the food system to activate a set of processes of change rather than aiming at ‘big bang’, or ‘once and for all’ changes (Kay, 2003).

We argue that the complexity of existing policies should be considered by facing the questions of ‘what needs to be integrated’ and ‘how can it be integrated’. To this purpose, we develop a conceptual framework to (i) assess the evolution of the policy cycles of the CAP to highlight how the food and nutrition concepts have evolved and have been reframed throughout five phases of the CAP, (ii) map and classify available instruments to assess potential synergies and gaps in view of a reorganization and (iii) indicate and discuss strategic tools for sustainable food policies. A methodological section in Appendix A explains the methodology adopted and data used. This contribution goes beyond the current literature by highlighting the obstacles which hinder the transition to a policy regime that embodies the nexus among food and nutrition security, natural capital preservation and climatic and social justice, and proposes new avenues for food policy studies.

Section 2 sketches out the conceptual framework. Section 3 applies the conceptual framework through an analysis of the evolution of food related policies; section 4 presents a classification and assessment of food-related policy instruments currently in place (4.1), an assessment of a set of policy gaps (section 4.2), to hence discuss the strategic tools to drive the transition to a policy for sustainable food systems (section 4.3). The concluding section (5) recaps and reflects on how this conceptual framework can contribute to a better understanding of food related policy processes and transitions in Europe.

2. The development of a European Food Policy as a transition process: a conceptual framework

Twenty years ago, public health policy scholars started arguing that food policies could contribute to improving nutrition by affecting diets (Lobstein, 2002), and proposed a new research agenda on the determinants of consumers' behaviour and on the role of policies in influencing dietary patterns and the characteristics of food (Hawkes et al. 2015). Likewise, the concepts of sustainable consumption and the role of consumers as food system change agents have started to be considered (Vermeir and Verbeke, 2006; Spaargaren 2011).

The 'food system' concept has become central in the discourses on food policy thinking as a response to the challenge of understanding the complexity around food. The literature on food systems can be traced back to the French School in the '70s (Malassis, 1979; Malassis and Padilla, 1986) while a significant impulse to its conceptual development was given by the Ericksen (2008) and Ingram (2011) and gained significant attention within policy circuits (HLPE, 2017).

Analysing a food system entails selecting relevant relations between activities (i.e. food production, processing, distribution and consumption), the actors who carry them out and the environmental and socio-economic outcomes that these activities contribute to, while identifying the relevant drivers of change (i.e. social, political, economic, historical and environmental) (Ericksen, 2008; Gharajedaghi, 2011; HLPE, 2017; Kopainsky et al. 2018).

Drawing from the seminal work by Rogge and Reichardt (2016), that provides a conceptualisation of policy mix key elements and their roles for sustainability transitions, we develop a conceptual framework that considers social dynamics activated by policies as drivers of system change (Figure 1 provides an overview of the main elements of the conceptual framework). This framework links the literature of policy cycles (Howlett et al., 2009; Sabatier et al., 2014) with transition approaches (Geels, 2004; Smith et al. 2005) and integrative approach to policy (Flanagan et al. 2011; Candel and Biesbroek, 2016; Mazzucato 2018). Systems – i.e. food systems in this case – are regulated by socio-technical regimes, a

set of meta-rules (i.e. rules that generate rules) that stabilize the system and regulate its functions (Geels and Schot, 2007). These meta-rules regulate knowledge production and identifying research questions and problem statements (cognitive rules), technological pathways setting the parameters upon which performance is assessed (technical rules), social norms, setting the values to which actors are inspired (ethical rules), and legislation (regulatory rules).

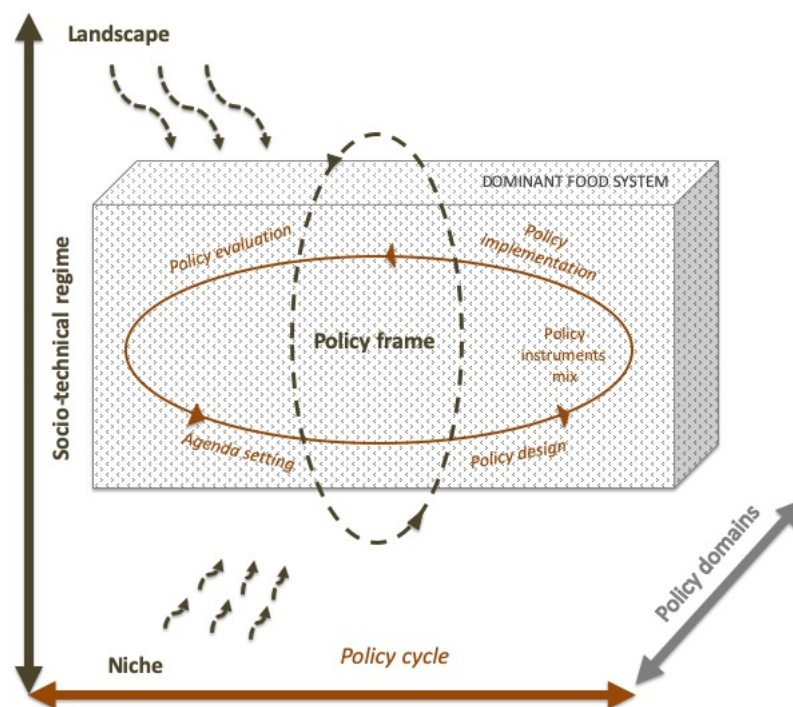


Figure 1 – A conceptual framework for policy transition. The dominant food system is represented in the dotted box and is shaped by three relevant dimensions: the vertical dimension (in dark grey) indicates the multiple levels of socio-technical transitions (niches, socio-technological regime, and landscape) which impact on and can trigger change in the dominant food system, affecting its policy frame. The horizontal dimension is the policy cycle in its key phases (agenda setting, policy instruments mix and policy implementation, policy evaluation - in brown), which take place in the different policy domains that are relevant for the food system (agriculture, health, environment, social policies etc.), represented by the third dimension (light grey). The dynamics among these key dimensions are all relevant to the policy process towards sustainable food systems in Europe.

Socio-technical regimes delimit the freedom of choice of actors: scientific paradigms affect public research policies, that in turn select innovation pathways; prevailing social norms set

normality and deviation; dominant business paradigms select dominant business models. The concept of socio-technical regime helps to understand the barriers to change when reforms are introduced: any policy reform is bound to get in conflict with existing cognitive, normative or technical rules, as much as with regulations in other fields. Successful reforms are seen here as the outcomes of processes of socio-technical transitions (Geels, 2004; Markard et al., 2012; Silva and Stocker, 2018, p. 61).

Resistance to change is embedded in all components of the policy process. When integration of policies is activated, trade-offs emerge. Trade-offs between policy objectives highlight potential conflicts between stakeholders and between values, and require political attention (Kanter et al., 2018). Vested interests are additional barriers: CAP has aligned huge investments, hundreds of rules, thousands of organized implementers and stakeholders (Kay, 2003), millions of beneficiaries, strong policy coalitions (Magrini et al. 2016). Even accumulated knowledge may create resistance: specialized administrative and technical skills (Kay, 2003) consolidate around given know-how and technology paradigms (Vanloqueren and Baret, 2008), and changing paradigms may make existing skills obsolete. In the transition approaches, resistance can be overcome when ‘niches’ – networks (or systems) that promote innovation outside the rules of the existing regime – are nurtured and supported to create a dynamic within the regime. Niche food systems need to be identified and characterized in their ability to support and trigger innovation in the dominant food systems (Gaitán-Cremaschi et al. 2019) and constitute a bottom-up driver that can activate new policy cycles by influencing problem definition or agenda setting in the policy cycles.

Transition can be promoted through an integrated management of the policy process and a deep understanding of the dynamics that link together *policies*, *politics* – that is, the activities concerned with pursuing goals, hold power and influence decisions – and *polity* - the way the legitimate power is organized and distributed. Based on this understanding, policy reforms –

aimed at changing, innovating and integrating policy tools under new goals - need to be designed and implemented as strategies for transition.

2.1 Policy frames

Policy frames are a key component of socio-technical regimes (Figure 1). They are composed of system representations and narratives that define the space of policy objectives, instruments and impact mechanisms.

Systems' representations identify a 'space of visibility' for decision making, that includes the variables that a governance unit can control. A plurality of representations can be built, depending on the policy problem and the governance unit: for example, if the policy problem is the sustainability of *production systems* (Zhang et al., 2018), the representation may focalise on production actors and activities, with a narrative addressing externalities and trade-offs between sustainability dimensions. If the focus shifts to *food security and nutrition*, system representations are centred on consumers, on the connections between actors and activities that feed them, considering also other subsystems affecting consumption, such as social policies and employment, while the narrative would look at the impacts of food system activities on levels and quality of consumption. Furthermore, territorialized representations of the food system, taking into consideration actors, activities and outcomes within set geographical boundaries, would suit best local administration aiming to improve the *community resilience*. Framing the representation of the food system too narrowly bears the risk that important trade-offs are being overlooked. Narratives provide ways to make sense of the functioning of the system by linking together actors, activities and outcomes, identifying critical points, causes of problems and possible solutions into timelines. For decades, for example, the narrative of 'feeding the world' has justified an effort to maintaining production support (Maye and Kirwan, 2013).

Dominant policy frames contribute to the stability of the system, limiting change to a set of possible options and pathways, while alternative policy frames challenge existing socio-technical regimes and propose new system representations and goals. Alternative policy frames are crucial for transitions, as they provide the criteria for the reorganization of the regime. Different policy frames and system representations represent different potential transition pathways: as there is no one single transition pathway, in fact, ‘the’ transition towards sustainable food systems is subject to debate (Plumecocq et al. 2018). With sustainability as a frame of reference, new policy frames require new knowledge and heuristics, based on and guided by ‘integrative concepts’ bridging across established sectors and disciplines (van Kerkhoff, 2005; Al-Saidi and Elagib, 2017). A set of integrative concepts relevant for food related policies are presented in the table in Appendix B, with definitions and key references. It should be noted that most of these concepts have been developed years ago and are more recently being endorsed by regime actors within dominant socio-technical regimes (e.g. sustainable intensification) while others originated in niches that aim for a shift towards a new socio-technical regime (e.g. agro-ecology) (Gaitán-Cremaschi et al. 2019; Candel et al. 2014).

2.2 Policy cycles

In transition theories, change can stem from different levels of the socio-technical system: for example, bottom-up (i.e. niche) initiatives adopting rules in contrast with the regime, activate new policy processes by creating reinforcing loops and scaling up. The literature on Alternative Food Networks illustrates how ‘niche’ initiatives based on radical alternative visions - such as organic farming, short food supply chains, fair trade - have been progressively incorporated into current regimes through support schemes, regulation and mainstream business models (see Michel-Villareal et al, 2019 for a review). Such

incorporation, as in the organic farming example, has changed both the regime and the niche, in some cases leading to the conventionalization (Darnhofer et al. 2010). Alternatively, changes in the broader context ('landscape') can encourage new policy frames that challenge the socio-technical regime in place. Or even transition pathways may emanate from efforts of niches in collaboration with regime actors or from the regime itself (Klerkx et al. 2010; Ingram, 2015).

Policies affect the system through *policy cycles*. A policy cycle is articulated into several phases, namely Agenda Setting, Policy Design, Implementation and Evaluation. In the *Agenda Setting* phase a policy problem - a gap between actual and desired outcomes of the system - is defined and prioritized (Howlett et al., 2009). Problem definition reflects given policy frames that provide system representations and rules for learning. *Policy Design* impacts on the socio-technical systems through mixes of 'policy tools'³. Effective and efficient 'policy mixes' are assessed in relation to policy goals and to the coherence of their components (Rogge and Reichardt, 2016). *Policy Implementation* is the interface between policy goals and socio-technical systems' functioning. Once a policy tool has been introduced in the political sphere, its implementation depends on a plurality of actors, procedures, and infrastructures. Implementation is often the least studied phase, yet its importance is crucial for policy effectiveness (Howlett, 2009). Ambiguous rules generate interpretation problems; a disproportionate number of beneficiaries with respect to the capacity of administration bodies delays implementation; multiple administration bodies involved may create conflicts of competences and interpretation; obsolete data management or control methods make the sanctioning system ineffective; influence of politics at local level may deviate from initial objectives. *Policy Evaluation* provides feedback to policymakers and to the broader community. Metrics, or indicators, are "functional information tools that indicate the state of

³ A widely used classification of policy tools is the one by Howlett and Rayner (2007).

a certain policy goal” (Zurek et al., 2018) and are crucial to politics and policy making (Global Panel, 2015; Allen et al., 2019), as illustrated by the proposed ‘new delivery model’, according to which CAP payments are linked to performance indicators (European Commission, 2018b). Given the importance of metrics through the policy process, evaluation is affected by the ‘politics of policy indicators’ (Bauler, 2012), as indicators’ use depends on their institutional embeddedness. Time- and change-sensitive assessment can be developed through dynamic modelling for integrated assessment and sustainable development of food systems, not only based on expert contribution but also involving stakeholders’ participation (Hebinck et al., 2018a).

Ultimately, transition needs transition policy cycles, based on appropriate policy frameworks and activated by tools able to foster a regime change. The following sections identify and discuss the necessary steps to build food-related European policies addressing the present societal challenges.

3. A retrospective view on Common Agricultural Policy and food and nutrition security

This section interprets the above illustrated framework in relation to the evolution of the policy cycles of the CAP. This retrospective view highlights how the food and nutrition concepts have evolved and have been reframed throughout five phases of the CAP evolution. The following table identifies these phases, each of them characterized by specific Policy frame and Policy cycle steps, namely agenda setting, policy design, implementation and evaluation (Table 1).

Elements of the Conceptual Framework	Phase 1 - The Rome Treaty	Phase 2 - The 1992 CAP reform	Phase 3 - The 'Agenda 2000' reform	Phase 4 - The 2013 reform	Phase 5 - The current CAP reform proposal
Socio-technical regime	European single market, Modernization paradigm	Washington Consensus, Multilateral governance, Single European Market	European model of agriculture and food, budget constraints, agricultural surpluses, BSE and the food safety crisis	Increasing instability, Climate change	European cohesion is at risk, policy sovereignty, food system under pressure, Agenda 2030
Policy frame	Free commodity circulation, productivity, support to farmers	Free trade + environment frames: market distortions, market imperfections, environmental impacts as externalities, from quantity to quality	Difference between territories, multifunctionality of agriculture, sustainability, competitiveness	Food security, Sustainable Intensification	Sustainable development goals, climate change, austerity policies, need for system approaches
Agenda setting	Agricultural Policy the first European Policy after steel and coal	GATT agreements, concerns expressed by the 'green' movements and by consumers	GATT agreements, Agenda 2000 of the EU Commission, role of the Regional Governments	Europe 2020 strategy.	Pressure by agricultural and environmental lobbies, Brexit, critiques on inefficient CAP spending
Policy design	Price support, high tariffs level	Agri-environment schemes, decoupled payments, quality policy, removal of national food quality regulation	Introduction of the second pillar	Strengthening of the conditionality, greening, payments in favour to young farmers and small farms	Re-nationalization, integration of ecological and food-related measures, research policy focused on system approaches
Implementation	Managed in Brussels, controls at the national level	Managed in Brussels, controls at the local level	Co-financing and co-programming: rural development plans managed by Managing Authorities, LEADER program managed by Local Action Groups, Conditionality	Complexity, Rigidity in the norms	New Delivery Model, National Strategic Plans (first + second pillar), old administrative infrastructure at the national level
Evaluation	Expenditure, Efficiency, Degree of market protection	Expenditure, Efficiency, Level of protection	Social, economic, environmental indicators. Rural development plans evaluated under a common evaluation framework	Inadequacy of the evaluation system	Monitoring of results and performance, impact indicators and frameworks

Table 1: Historical evolution of food related policies in the EU, according to time frames and key elements of the Conceptual Framework

Phase 1 spans from the Treaty of Rome in 1958 up until 1992. The CAP was initially established with the double purpose of ensuring food security and creating a 'European Agricultural Welfare' (Sheingate, 2006; p.115) with a high level of protection of farmers and consumers in a market economy. Regulated prices and the removal of barriers to internal trade were the two keys to the intended outcomes (Ackrill, et al. 2008). At the time of the Treaty of Rome, food security was interpreted exclusively as food availability, and production increase would be sufficient to achieving this goal. The single market aimed at ensuring fair internal competition and regulated guaranteed prices supported farmers' income stability. This 'productionist' policy frame was based on a simplified system representation, which included farmers, agricultural outputs as food, food as a standard commodity, and food security as food availability (Candel et al. 2014). Subsequent policy measures – for instance, food quality standards (Dibden et al. 2009) and seeds regulation (Bocci, 2009) - were inspired and coherent with this representation. The socio-technical regime was characterized by a regulatory effort to establish a single market for agricultural commodities, and policy measures were inspired to the agricultural modernization paradigm, focused on productivity. In the dominant policy frame, the impact of food production on the environment was not considered, nor the multiplicity of quality features related to taste, genetic variability, origin had a place in the representation of the system of reference.

The second phase (1992-2000) pursues the identification of European agriculture within a free trade framework. With the 1992 reform, the European Court of Justice triggered the removal of national food quality regulations and environmental concerns were integrated into agricultural policies. The reform was boosted by the GATT agreements that labelled price support tools with distorting effects as 'red' box and incorporated the environment and food quality into the system representation. At the same time, the European Union kept a firm position against the liberalization

of trade for hormone-treated beef and Genetically Modified Organisms (GMOs) (Moyer and Josling, 2017). The resulting frame can be interpreted as a merge of the ‘free trade’ and the ‘environment’ frames (Candel, 2014). The impacts of agricultural activities on the environment were framed as externalities, to be corrected through appropriate support measures aimed at making environmentally friendly farming techniques profitable for farmers. Quality was invoked to justify direct payments rather than price support. In a separate regulation, products with local identity were protected at EU level through a specific regulatory framework.

The beginning of the third phase (2000-2013) is marked by a speech of Franz Fischler, the Commissioner of Agriculture of the time, stating that “*The features of a ‘European’ model of agriculture are the focus on high safety standards, food quality, and on a sustainable development of rural areas across the whole Community*”⁴. The 1999 CAP reform was set out by a strategic document of the European Commission – Agenda 2000⁵ – that sketched out the new policy frame. At the time, the EU Commission justified the high level of agricultural support with the production of public goods, in response to the GATT agreements. In Agenda 2000, the need for a ‘true’ rural development policy was emphasized (Marsden, 1998). Differences between territories based on degrees of rurality were considered, while defining subsidies and policy tools, and the multiple functions of agriculture were recognized (Marsden et al., 2001). Environmental concerns were embodied into a broader sustainability concept launched by the UN (United Nations, 1987). From 1999 onward, the CAP reflects two opposing policy frames: the one inspiring the ‘first pillar’, focused on market competitiveness concerns, and the one inspiring the ‘second pillar’, aimed at rural development and centred upon the multifunctional role of agriculture. Rural Development and

⁴ Franz Fischler - Opening Speech for International Green Week 1999 Berlin, 21 January 1999 - http://europa.eu/rapid/press-release_SPEECH-99-9_en.pdf

⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:l60001>

multifunctionality were interpreted by scholars as socio-technical paradigms alternative to modernization (Van der Ploeg et al. 2000), and policy makers saw Rural Development as the policy frame for non-competitive agriculture. The reform upgraded CAP principles and introduced new objectives, new tools and new governance mechanisms, albeit 'stratified' upon the former ones. Rural development policies fostered a profound change in the polity as well: co-financing gave Member States power of decision, and in many countries Regional Governments were involved. The LEADER program, firstly financed by the cohesion policy and then embodied into the rural development policy, has been a testbed for alternative models of development inspired to sustainability. Integration with other policies has been pursued through the 'cross-compliance' principle (Meyer et al., 2014), according to which farmers are entitled to CAP support if they comply with environmental, food safety and animal welfare rules. These changes have opened new fields for politics, with new stakeholders and policy fora. Also, the evaluation process has been structured and further implemented, as each rural development plan had to be evaluated within a common evaluation framework.

The following more recent phase (2013-2019) begins with the 2013 CAP reform and is influenced by the 2007-08 food crisis, during which world food prices witnessed a dramatic increase and volatility. This crisis gave impetus to the debate on food security in Europe, which gained significant attention in the policy agenda making policymakers aware that food and nutrition security is at risk also in the Global North (Brunori et al. 2012; Candel et al., 2014; Nazzaro and Marotta, 2016). However, food security was mainly interpreted as a food availability issue and was used to sustain the push for keeping the level of production high and justifying strong farmers support (Maye and Kirwan, 2013). The need to conciliate production yields with sustainability made the concept of 'sustainable intensification' popular (Godfray, 2015). In policy terms, this has

led to introducing ‘greening’ measures – first pillar payments linked to environmentally friendly practices – as emblematic. The implementation of greening has been criticized due to the constraints for farmers, and the European Court of Auditors (2017) complained about the difficulties to measure its effectiveness, especially in terms of environmental benefits.

The new and current phase is characterized by major political challenges for Europe, epitomised by Brexit and the wake of nationalisms, terrorism fears and social concerns about migration. In the last decade the attention gradually shifted from the agricultural sector to the broader food system, particularly stimulated by a set of policy documents recently released⁶. These represent a qualitative leap forward in the European commitment to societal challenges, as codified into the ‘New European Consensus on development’⁷ of the European Council, giving new thrust to the debate on policy integration. In the aftermaths of the 2015 World Expo, the Milan Charter⁸ was issued, advocating for the right to food for all and pledging to combat “undernutrition, malnutrition and waste, promoting equitable access to natural resources and ensuring sustainable management of production processes”. Concurrently, the Milan Urban Food Policy Pact⁹ - advocating the development of urban food policies – has been released and signed by 187 municipalities in the world. Meanwhile, the Commission has launched a research program on food that aims at changing the existing policy frames and the paradigms that contribute to them, in depth. The FOOD2030

⁶ A paper by Fresco and Poppe (2016) argued for a profound transformation of the CAP through the integration of food themes and involvement of all actors of the food system. The Canadian government published a document setting the principles for a Canadian food policy in 2017. The European Economic and Social Committee and the Committee of the Regions advocated the development of a European Food Policy (EESC, 2017). The EU Commission launched the report ‘Recipe for change: an agenda for a climate-smart and sustainable food system for a healthy Europe’ (2018), and the High-Level Panel of Experts on Food Security and Nutrition, advises the adoption of a system approach to policies for food security (HLPE, 2017). Recently, a consultation of over 300 experts and civil society representatives, yielded a report ‘Towards a common food policy for the European Union ’ that aims at realigning the various sectoral policies (IPES Food, 2019). The private sector also intervened in the debate: for example, Barilla in Italy (BCFN MUPFF, 2018) and four big corporates in the US have spoken in favour of the establishment of sustainable food policies (Sustainable Food Policy Alliance).

⁷ https://ec.europa.eu/europeaid/sites/devco/files/european-consensus-on-development-final-20170626_en.pdf

⁸ http://carta.milano.it/wp-content/uploads/2015/04/English_version_Milan_Charter.pdf

⁹ <http://www.milanurbanfoodpolicypact.org/text/>

research and innovation policy framework suggests four priorities for research and innovation: nutrition for sustainable and healthy diets; climate smart and environmentally sustainable food systems; circularity and resource efficiency of food systems, innovation and empowerment of communities (EU, 2017). This framework is supposed to pave the way to future food policies. However, the reform post-2020 is going to disappoint those who advocate for a radical transformation of the CAP into a comprehensive food policy (IPES Food, 2019; Fresco and Poppe 2016), as in the official text so far released¹⁰ food-related objectives are added to a long list of objectives¹¹ and the general setup of the policy tools has not changed in a substantial way.

4. Policy integration for transition: what to integrate, how to integrate

4.1 What to integrate? Processes and instruments for a sustainable food policy

The policy cycles considered above have generated and accumulated a plurality of policy instruments, adding to the previous ones. In order to pursue policy integration, the first step is to map and classify available instruments, to assess potential synergies and gaps in view of a reorganization (see Appendix A for a methodological note on how the policy instruments were selected and mapped). Table 2 provides an overview of the current food-related policy instruments, sorted according to a set of policy domains, referred to the Directorate General at European level (in the columns). As a second criterion for mapping policy instruments, we have identified three macro-areas for policy integration (in the rows) drawing upon the three constituent elements of

¹⁰ https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en, (accessed July 2019)

¹¹ Two out of nine objectives of the proposed CAP reform have an explicit food system scope (i.e. ‘to rebalance the power in the food chain’, and ‘to protect food and health quality’).

HLPE's food system framework (2017)¹². The first is 'food production and distribution systems' (i.e. food supply chains), the second is 'consumer behaviour' and the third is 'food environments'. The policy instruments in Table 2 are indicated in bold when they are not uniformly applied across the European Union and in italics whereas they consist of private tools (which could eventually be embedded into policy instruments). Appendix C provides the list of policy instruments included in Table 2 and indicates, where available, the main legislative acts of reference for each one.

¹² The HLPE on Food Security and Nutrition (2017; pp.26) identifies three core components of food systems, namely the food supply chain, the food environment, and the consumer behaviour.

Policy domains (DGs) at the European level									
Macro-areas	Agriculture and Rural Development	Environment	Health	Justice, consumer, Education, Youth, Culture	Competition Trade	Internal Market, Industry	Employment	R&I	Others*
Consumer behaviour	[11] Promotion of organic food in Rural Development (RD) [2] Diversification (RD)	[21] Food education (e.g. waste) [27] Strategy for sustainable consumption and production	[32] Dietary guidelines [34] Food for specific groups [35] Fortification [42] Strategy for Europe on Nutrition, Overweight and Obesity [27] Animal welfare labelling [44] Traffic light labelling	[45] Support to consumer groups [46] Food education	[50] Agri-food trade agreements [48] Price monitoring [49] Rules on food recovery and redistribution	[56] <i>Social responsibility</i> [57] Public procurement [58] <i>Foot-printing</i> [62] Food taxation measures		[67] 'Nudging' tools [68] Knowledge on healthy diet options, [70] H2020	
Food environments	[10] Promotion campaigns for agri-food [3] Agri-food trade [7] Fruit and milk schools' scheme [15] Support to Short supply chains	[22] Green public procurement [20] Drinking safe tap water	[36] General food law [40] Hygiene package [33] Food labelling [34] Food for specific groups	[47] Children Food advertising	[50] Agri-food trade agreements	[59] Retail zoning and commerce licensing [61] Information and communication, advertising	[65] FEAD (Food aid)	[67] 'Nudging' tools [73] Smart Development [69] LIFE program, [71] EIP Agri [73] Smart development	[75] Urban food planning [74] Urban agriculture and short food chains

Macro-areas	Policy domains (DGs) at the European level								Others*
	Agriculture and Rural Development	Environment	Health	Justice, consumer, Education, Youth, Culture	Competition Trade	Internal Market, Industry	Employment	R&I	
Food production and distribution systems	[1] Agri-env-climate payments (RD) [2] Cooperation measures (RD) [3] CMO and external trade [4] Compensation payments [5] Direct payments [6] Farm investment support (RD) [8] Greening and cross-compliance [9] Organic farming [12] Quality products promotion [13] Quality schemes (PDO PGIs) [14] Advisory services [16] Small farmers scheme [17] Unfair trading practices	[23] Nitrates directives [24] Soil protection policies [18] Circular economy [19] Coastal and Marine policy (Fisheries' maximum sustainable yields) [25] National Emissions ceiling [26] Biodiversity strategy linking to RD measures	[41] Nutrition and Health Claims [36] General food law [41] Hygiene package [33] Food labelling [43] Pesticides [29] Contaminants [39] Hormones in meat and residues [31] Food contact materials and packaging [38] GMO rules [28] Anti-microbial resistance [43] Registration, certification, marketing equivalence rules for seeds [30] Country of origin labels	[48] True cost pricing	[51] Competition policy (antitrust) [52] State aid in agriculture and forestry [53] Import tariffs, quotas, non-tariff barriers [50] Agri-food trade agreements [54] Intellectual property rights <i>[55] Fair trade rules</i>	<i>[60] Corporate social responsibility</i> [61] Information and communication [63] Support to food business and agro-tourism [57] Public Procurement <i>[64] Private standards</i> [61] Information, communication, advertising [62] Food taxation measures <i>[58] Footprinting</i>	[66] Illegal employment prevention	[69] H202070 LIFE program [71] EIP Agri [72] Bio-economy	[76] Infrastructure and transportation of food [77] Support to small farm processing

Table 2: Food-related policy instruments, according to the three macro-areas for policy integration on Food Security and Nutrition (HLPE, 2017, in the rows) and a set of policy domains, referred to the EU Directorate General (in the columns).

Legend: [x] Reference to the policy tool reported in Appendix C

* Others: not referable to a specific Directorate General of the EU.

In bold: policy instruments not applied uniformly at EU level. In Italic: private initiative.

The macro-area ‘Food production and distribution systems’ consists of the activities and actors responsible of the different processes, including the life of the product after consumption (Hawkes, 2012; HLPE, 2017; pp.83). It gathers food-related policy instruments that help ensure that food on the market is sourced from sustainable production and distribution systems. In case of production and distribution systems internal to a country, direct regulation of system activities may be feasible. In relation to external supplies and trade, trade rules and support to responsible consumption become relevant. This macro area includes food safety and rules on the nutritional value of foods produced and delivered, their composition and their effects on human intake. For example, the presence of contaminants or ingredients harmful to health (i.e. toxic residues, salt, fats, sugar, additives, allergens) or the degree of processing that influence nutrients content and bioavailability. Or the characteristics of packaging that impact on the hygiene, safety and nutritional quality of foods. It should be noted that clean, safe and nutritious food may still be considered unsustainable if its production and consumption relies on excessive extraction of natural stocks – as in the case of fish – or on pollution of soil, or further, exploitation of workers.

The second macro-area concerns ‘consumer behaviour’ and reflects the choices made by consumers, at household or individual levels, on food purchases, storage, preparation and consumption (HLPE, 2017; pp. 11). Consumer behaviour is influenced by personal preferences determined by taste, convenience, culture and other factors. Supporting consumers’ food practices towards healthier and sustainable diets implies not only addressing nutritional aspects but also considering social justice, the ecosystem and culture.

The third macro-area ‘food environments’ (HLPE, 2017; pp. 94) that refers to the physical, economic, political and socio-cultural surroundings, opportunities and conditions that create everyday prompts, shaping people’s dietary preferences and choices as well as nutritional status (Swinburn et al., 2015). This macro-area gathers policy tools that tackle the food environment,

creating symbolic and material living conditions that ‘nudge’ consumers to adopt more sustainable diets. These facilitate access to nutritious food, to knowledge about the impact of food on nutrition, environment and society, and foster the consolidation of social norms that pursue sustainable diets.

These macro-areas for policy integration are clearly inter-linked: food consumption is shaped by consumers’ knowledge, skills, motivations, and enabling food environments that allow consumers access to clean, safe and nutritious food for individuals to make the best consumption choices. Depending on the scale considered, availability of safe and nutritious food can be based on internal production or on trade. Food production and distribution systems should be sustainable, wherever their scale (local, national, external) and consumers’ motivations and behaviours have the power to influence producers’ strategies, foster innovation and shape economic models (Hawkes, 2012). Likewise, innovative business models promote system change and create a positive feedback with responsible consumption.

4.2 Assessing policy gaps in current food-related policy instruments

Most European policy instruments assessed are inspired to sustainability principles (European Commission, 2016). However, in each macro-area, key examples of policy gaps (i.e. misalignment with respect to sustainability objectives) can be made, based on available literature (see Appendix A for a methodological note on how the policy gaps were identified). We have qualified these gaps in terms of agenda setting, policy design, implementation mechanisms or evaluation (Table 3). The allocation of policy gaps in the macro-areas, to some extent indicative, is not exhaustive, and additional policy gaps could be investigated, including analysis across the key macro-areas, highlighting for example how production and distribution systems influence

food environments, diets and consumption and the implications for policy design and implementation.

As part of the macro-area ‘Sustainable food production & distribution systems’, there is a long-standing debate on the effectiveness of direct payments not being fully verifiable in terms of the sustainability performance of farmers. Whereas “greening” shows a limited capacity to contribute to changes in the food system, both in its design and in the implementation, also second pillar’s agri-environmental voluntary measures are partially able to counterbalance trends of overcapitalisation and intensification linked to the first pillar direct payments. Further, they show limitations in terms of design, monitoring, control and evaluation (European Court of Auditors, 2018).

Macro area	Policy gaps	Policy cycle phase	Reference literature
Sustainable food production & distribution systems	Direct farm payments are limitedly oriented to sustainability performance	Design	Pe'er et al. (2019) Ecorys (2017) European Commission (2018c)
	Agri-environmental measures: monitoring and control of the effectiveness is poor	Design, Implementation and Evaluation	European Court of Auditors (2018) Raggi et al. (2015) Börner et al. (2017)
	Greening overlaps with agri-environment and cross compliance, it is not effective	Design and Implementation	European Court of Auditors (2017) Pe'er et al. (2014, 2017)
	EU quality policy lacks reference to environmental performance of traditional products	Design	Belletti et al. (2015)
	EU trade policy fails to consider sustainability aims	Design	Sharpe & Barling (2019) IPES Food (2019) OECD (2016b)
	General food law policy lacks an integrated approach to health and nutrition	Design	Laaninen (2017)
Food consumption and sustainable diets	EU Labelling schemes for nutrition and sustainability are limited to voluntary initiatives and the efficacy is doubtful	Design and Implementation	Barreiro-Hurlé et al. (2010) Capacci et al. (2012) Grunert et al. (2014) Messer et al. (2017)
	Fruit and milk scheme is poorly integrated within a strategic framework on sustainable consumption	Design and Implementation	European Public Health Alliance (2016)
	Green and sustainable public procurement is limited by public procurement rules and voluntary	Design and Implementation	Renda et al. (2012) Smith et al. (2016)
	Food surplus redistribution for social purposes and waste reduction	Implementation	Galli et al. (2019, 2018b) Hebinck et al. (2018b) Baglioni et al. (2017)
Sustainable food environments	Urban food policy planning only pioneering experience and lack of funding	Agenda Setting	Lang et al. (2009) Sonnino et al. (2019)
	Short food chains support is production oriented and sits within rural development but governed at regional level	Design and Implementation	Filippini et al. (2019)
	Food taxation measures (sugar or fats) only at national level and contested	Agenda Setting	Niebylski et al. (2015)
	Nudging tools just starting to be debated	Agenda Setting	Lehner et al. (2016) Cadario & Chandon (2019)
	Food advertising restrictions (children) are diverse and raise controversies	Agenda Setting and Design	Russell et al. (2019) Cairns (2019)

Table 3: Policy gaps per macro-area, phase of the policy cycle and relevant literature

The EU Quality Policy is an example of policy targeting productive systems to diversify the food supply and has managed, at least in some situations, to valorise traditional productions, ensuring

transparent information to the consumer and a fair return to the producers. However, a gap in the policy design can be identified in the lack of reference to environmental performance of traditional products (either in the Regulation or in the process of construction of the producers' specification), whereas an extension of these tools to environmental goals could set environmental criteria within codes of practice. While agricultural markets face the distortions deriving from agri-food policies, hampering efficiency while addressing market failures (OECD, 2016b), substantial contradictions with respect to sustainable development are highlighted (IPES Food, 2019). Similarly, in relation to the General Food Law, which successfully provides a framework for food safety regulations, there is a lack of overall strategy with respect to nutrition, environment and the sustainability of production systems. This is well illustrated by the contestations around the 'traffic light' nutritional labelling, which overlooks the sustainability of the diet while potentially harming high quality products like extra-virgin olive oil and Parmigiano Reggiano (Bolongaro and Livingstone, 2017).

Among the examples on the 'food consumption and sustainable diets' macro-area, the 'fruit and milk in schools' scheme sits within the CAP regulatory framework. Literature indicates that 'Milk in the schools' is criticized for its doubtful contribution to sustainable nutrition (European Public Health Alliance, 2016; Giuca, 2016) and one of the causes is the limited coordination with education policies, effectively reinforcing the educational dimension to ensure that children learn the benefits of healthy eating and reconnect to agriculture. The definition of the criteria for Sustainable Public Procurement in food and catering sectors - where the public food procurer is theoretically in the best position to choose the healthier and more sustainable option for its citizens - has proven difficult to implement as several obstacles arise in the definition of what "sustainable" means in the terms of contract tenders. At the same time, the implementation of green public procurement is limited by the difficulty to converge on a set of shared criteria, while

remaining a voluntary tool which lacks appropriation by municipal public authorities. Similarly, EU Labelling schemes for nutrition and sustainability are limited to voluntary initiatives and the efficacy is doubtful (Grunert et al., 2014). Further, the contradictions between food poverty affecting a large section of the global population and the everyday wastage of food, particularly in high income countries, have steered the attention on the role of food assistance public and voluntary initiatives (Galli et al. 2018b; Hebinck et al. 2018b). However, authors are pointing out the vulnerabilities of food assistance systems, occurring when addressing food poverty by reducing food surplus (Baglioni et al. 2017; Galli et al. 2019). In this sense this is also an example of a cross-cutting policy gap (i.e. across the macro-areas), addressed by a recent reform of the European food aid policy, currently implemented through the Fund for European Aid to the Most Deprived (FEAD). The reform, aimed at improving the targeting and poverty alleviation, dismissed the previous funding mechanisms that relied on the redistribution of agricultural surpluses – largely determined by CAP payments – to the most disadvantaged citizens of the European Community (Galli et al. 2018a).

As part of the ‘Sustainable food environments’ macro-area, urban food policy planning consists of pioneering experiences, which often lack dedicated funding while governance arrangements at municipal, regional and international scales are highly fragmented (Di Donato et al., 2017; Sonnino et al. 2019). Looking at territorial food production, short food chains support is mainly production oriented and sits within rural development plans, when activated and governed at regional level. Moreover, the interactions between local food production and sale initiatives rarely interacts with urban planning logics (Pothukuchi and Kaufman, 1999). While food taxation measures (e.g. for sugar or fats) influence the food environment and are experimented at national level, they are highly contested (Niebylski et al. 2015) as prove to be food advertising restrictions (i.e. for children) which are implemented by policies in diverse ways depending on context and

countries (Russell et al. 2019; Cairns, 2019). The role of nudging tools in shaping a sustainable food environment, are starting to be debated and analysed in their controversial aspects, however implementation is still way behind (Lehner et al 2016; Cadario and Chandon 2019).

Implementation of food systems policies may become stronger whereas policy tools are directly implemented by sub-systems: for example, when policy instruments require activation by regional governments (i.e. Nitrates Directive), or even by city governments (i.e. Public Procurement) this allows a better targeting of the actions in relations to local specificities. In other cases, the involvement of sub-systems supports the adaptation of European rules to local conditions (i.e. Seed policy).

Rural Development policy contemplates a growing number of food-related measures, such as cooperation measures, that support quality schemes uptake and food processing as well as collective provision of public goods (Kuhfuss et al., 2016). A system approach would mobilize these measures to encourage stronger alignment between public and private actors. For instance, private quality schemes and sustainability standards (Henson and Reardon, 2005) could be aligned with agri-environmental schemes, providing market outlets to virtuous practices, linking competitiveness with sustainability (Fresco and Poppe, 2016), and reducing the public burden of implementation costs.

4.3. How to integrate? Strategic tools for a sustainable food policy

While new policy goals encourage connections between subsystems, long-term established policy subsystems act as ‘siloes’ (Loorback et al, 2017), separate from each other and protective of their competences. This limitation is well acknowledged by policy makers at EU level, as in the evolution of the Common Agricultural Policy we can see a move from centralized, one size fits all tools, to tailored tools based on strategies. Rural Development policies are based on strategic

plans designed by Member States or Regions, and the need to strengthen the strategic component has been given a growing emphasis in the years. Strategic plans are also the instrument for funding of LEADER measures. In the recent CAP reform proposal, all policy measures – both belonging to the first and to the second pillar - at national level are framed into national strategic plans identifying specific performance indicators. Moreover, cooperation measures give support to networks of actors upon presentation of strategic plans.

Strategic tools are supposed to break the siloes and foster the alignment of policy tools, administration bodies, civil society and private stakeholders around new goals (Candel and Biesbroek, 2016). In relation to food systems, the European Economic Social Committee (2017) has proposed a ‘Sustainable food Scoreboard’ indicating targets to measure progress in food policies. Likewise, a ‘policy roadmap’ was proposed by a group of scholars to provide guidance on possible transition pathways, suggesting the necessary flexibility to pursuing the goals¹³ (Smith et al., 2016). In a food-focused policy for sustainable food systems, strategic tools should address the complexity of the transition processes, identifying the transition points, the actors that can lead the change, and encouraging the change of policy frames and system representations at all levels of the system.

In the view of transition, the overall strategy could be articulated into a hierarchy of strategic tools aligned to the SDGs and procedures for accountability (Pe’er et al. 2019). These identify targets at a broad level and their main function is to set new policy frames and a new policy agenda. SDGs achievement needs more specific targets at appropriate levels, associated with specific levels of governance, with a nested – and broader – set of strategic tools. If SDGs

¹³In the context of the EU funded GLAMUR project (www.glamur.eu).

provide a strategic frame of reference (i.e. the *landscape*), EU and National levels implement the strategy at regime level, while lower level strategic tools could provide ‘niche’ strategic levels.

Table 4 provides a tentative list of strategic tools for sustainable food policies corresponding to different phases of the policy cycle, with suggestions and exemplifications in relation to food systems. The tools broadly concern governance structures, knowledge creation, participation of public and private actors, evaluation processes, and metrics (see Appendix A for a methodological note).

At the level of agenda setting, strategic tools able to suggest and consolidate new representations of the food systems and to foster learning, consolidate coalitions of interest, provide political support to change should be activated. This would contrast the inertia by dominant techno-economic paradigms and to address the gap between dominant and alternative policy frames supporting communication between ‘change actors’ and ‘opponents’ (Kirton and Trebilcock, 2017).

At the level of policy design, a systematic alignment of food-related policies with all relevant SDGs –including the ones marginally or not addressed, as SDG 12-Responsible consumption and production (Pe’er et al. 2019) –implies the revision and the formulation of new policy goals. Further, the definition of horizontal and vertical governance structures (e.g. inter-ministerial bodies at municipal or metropolitan levels, coordinated at regional or national levels, Sonnino et al. 2019) to encourage the collaboration across administration bodies and bottom-up processes to improving adherence to the needs of communities and actors.

At the level of implementation, at least two new actors should be involved in a strategic framework: municipalities and private actors. Private actors often follow an autonomous agenda of change and set strategies – aimed at qualifying and certifying brands, products or processes as sustainable to consumers and business partners – that could be better aligned with public

strategies, identifying common targets, standards, accountability systems and related support schemes. This could contribute to foster a commitment to social responsibility, information disclosure and to opening corporate deliberation to civil society (Kirwan et al., 2017). Similarly, municipalities, that have competences related to food – commerce, infrastructures, health, hygiene controls, education – may have a relevant role if endowed with appropriate strategic tools and adequate financial resources.

At the level of policy evaluation, there is a need for measurement tools, especially addressing consumption and nutrition outcomes. Developing metrics capable to measure the fulfilment of performance targets will help to identify the trade-offs between the policy mix of instruments with SDGs and develop accountability procedures.

Policy cycle	Strategic tools	Examples and suggestions
Agenda setting	Tools to encourage the consolidation of new system representations	<ul style="list-style-type: none"> • R&I policies for initiatives on social innovation processes, science-policy-practice interfaces and multi-stakeholder partnerships. • RD plans encourage new representations of local production systems including environmental concerns, landscape quality, links with other economic sectors.
	Tools to foster learning, consolidate coalitions of interest, political support to change	<ul style="list-style-type: none"> • RD policies provide tools for cooperation, innovation and learning. They could be extended to consumers and civil society organizations
Design	Revision and formulation of new policy goals at EU, national and regional levels	<ul style="list-style-type: none"> • The new CAP delivery model could set objectives related to nutrition-sensitive agriculture and availability and access to food produced, distributed and subsidized in Europe in terms of nutritional as well as environmental quality.
	Definition of horizontal and vertical governance structures	<ul style="list-style-type: none"> • Food policy dedicated offices at municipal or metropolitan levels. Urban food strategies can become the core of a European Food Policy. • Rural development plans addressing territorial food systems and not just production systems.
	Tools to encourage collaboration across administration bodies	<ul style="list-style-type: none"> • Cross-sector objectives stimulate sharing of information and cooperation. • Data sharing, statistic, reporting tools, the establishment of 'food fora' (Brunori et al. 2016)
	Tools to encourage bottom-up processes	<ul style="list-style-type: none"> • Aligning strategic tools at all levels to create and support a niche-regime-landscape dynamic
Implementation	Involve new actors, encourage a broad participation of all stakeholders.	<ul style="list-style-type: none"> • Municipalities build sustainable food environments, foster sustainable diets, and contribute to regional production and distribution systems (Pothukuchi and Kaufman, 1999). • Municipalities may increase the plurality of the system by involving citizens and consumers in its governance (Ilieva, 2017), supporting local producers by opening new markets, encouraging research on small size processing technologies. They may also identify vulnerable consumer groups and improve their access to nutritious food and their diets and involve food business in the achievements of sustainable nutrition targets (HLPE, 2017; Sonnino et al., 2019).
	Align private and public sustainability strategies and standards	<ul style="list-style-type: none"> • Private sustainability standards led by retailers or processors are effective in aligning food system actors. Rural Development plans already provide schemes for cooperation that may fit with private standards • Voluntary standards for corporate social responsibility or for sustainable forest management regulated by public bodies
Evaluation	Development of new performance metrics	<ul style="list-style-type: none"> • Policy indicators integrating public and scientific perspectives within a balanced science-policy-practice discourse (Janoušková et al., 2018).
	Monitoring of food systems' performance	<ul style="list-style-type: none"> • Ethical standards, against which policies and actors' behaviour can be evaluated and accounted for (Kirwan et al., 2017) • Some Member States and Regions have developed training courses, guidelines, communication plans to align administration bodies successfully

Table 4 Strategic tools for sustainable food policies, per policy cycle phase, with examples and suggestions

5. Policy change for transition: concluding remarks

A sustainable food policy implies going well beyond the CAP. It implies setting new policy goals, developing new policy frames, designing new policy mixes and new evaluation approaches. The multidimensionality of the sustainability performance of a food system - including health, ethics and resilience as explicit goals of food policies – is to be acknowledged, alongside developing and designing policy mixes that address sustainable consumption and production.

The analysis of the evolution of European food-related policy cycles (section 3) has made clear how policy frames – and related system representations – have evolved over the time, and how they have affected policy cycles. An increased understanding of the importance of the link between policy frames and policy cycles on the underlying food system can improve the capacity to generate transformational change, as the challenges that the European Union has set would imply.

The analysis of current policy tools and related policy gaps (sections 4.1 and 4.2) indicates that reformers should undertake systematic reviews of existing tools to identify incoherencies, gaps and potential synergies, thus activating their reorganization and the introduction of new policy tools. Particularly it shows that:

- a good deal of existing tools is coherent with sustainability goals, but needs better coordination and upgraded governance patterns, with the involvement of new actors at different scales;
- tools already in place (such as ‘fruit in the schools’, food assistance, public procurement schemes, food education) could be scaled up and better integrated with other tools to have a significant impact.

We have also seen (in section 4.3) that this broad reorganization would need strategic tools able to activate bottom-up and top-down processes of change. The discussion on strategic tools has shown how a system perspective implies a reorganization of strategic tools and the involvement of new actors, namely the food industry and municipalities. Urban food policies - that are being experimented by a growing number of municipalities without financial support and out of an overarching policy framework (Sonnino et al., 2019) - or corporate sustainability strategies, are examples of 'niches' of innovation that can support the regime transition if aligned to policy goals.

We have highlighted that transition requires new policies as well as new polities. A renewed polity, characterized by a stronger involvement of civil society organizations and with a central role of urban municipalities, can contribute to a more socially robust system representation, deal with ethical dilemmas and stimulate reflection of policy makers on future challenges. Multilevel governance is key in the consolidation of new policy frameworks through bottom-up approaches and a broad participation of all stakeholders.

As a critical point of intervention towards a transition of food systems we highlight the need to look at the processes of knowledge production, use and communication. Transitions can occur both for the thrust of new practices, business models, governance patterns that challenge the existing ones, or as a consequence of top-down reforms. Knowledge is a fundamental driver of system innovation. Better information can help consumers reflect on the consequences of their choices. Deliberative spaces of discussion can broaden the social consensus and improves effectiveness. Better education can foster awareness of the links between diets, health and the environment. Innovative metrics can help policy-makers and practitioners to assess food policies and interventions towards defined goals and help producers and distributors to assess sustainability performance of their organizational patterns and sourcing strategies. For this

reason, an effort to undertake a transition to a sustainable food policy cannot avoid considering a new research agenda. We have already highlighted how ‘integrative concepts’ can guide policy makers in identifying integration pathways. Many of these concepts have already opened new fields of enquiry that shake the consolidated boundaries between disciplines, but a lot is to be done. It is a challenging time for researchers.

Appendix A - Methodological notes

This paper draws upon multiple sources of evidence and benefits of a research, carried out by the authors over the years 2016-2018, on food policy mapping and assessment at European level.

The policy influence on European food systems concern several policy domains, on which the European Institutions and the Member States legislate. The preliminary identification of the relevant policy instruments was done based on to the “Communication on the next steps for a sustainable European future” (EC, 2016), accompanied by a Staff Working Document. These documents list all the policy acts from the EU that contribute to the achievement of the 2030 Agenda for Sustainable Development and, in turn, to the SDGs. After this preliminary list of policy instruments related to the food system was developed, a mapping specifying the policy domain and the legislative acts of reference was carried out (list available in Appendix C). The assessment of the policy gaps across policy instruments, with respect to sustainability dimensions, and identification of the tentative list of strategic tools for sustainable food systems was developed based on literature and policy documents analysis and in exchange with a group of NGOs¹⁴ active at EU level. The confrontation relied on online meetings and one dedicated

¹⁴ Slow Food, Friends of the Earth, Public Health Alliance, IFOAM

workshop organised in Brussels in April 2017¹⁵. The outcomes of this research are reflected in the sections 3.2 and 3.3, respectively focused on policy processes for a sustainable food policy (what to integrate) and strategic tools for transition (how to integrate). The evolution of food-related policies (section 3.1) is an outcome of a reflection based on literature analysis done in preparation of a seminar in the context of the debate on the CAP reform in Italy¹⁶.

¹⁵ A report with the policy mapping and analysis of inconsistencies and gaps in food related policy tools was released in occasion of the IPES Food conference in Bruxelles in May 2018. Available here:

https://www.researchgate.net/publication/325248769_A_transition_towards_sustainable_food_systems_in_Europe_Food_policy_blue_print_scoping_study

¹⁶Seminar organized by the Italian Association of Agricultural and Applied Economists (AIEAA). Italian agriculture and the new model of support for the post-2020 CAP' Rome 30th November 2019

<https://www.aieaa.org/node/376>

Appendix B - Integrative concepts related to food: definitions and references

Integrative concepts	Definition	Reference
<i>Safe operating space</i>	It is an “ <i>approach proposed for defining preconditions for human development</i> ”. A “ <i>safe operating space for humanity with respect to the Earth system</i> ” is defined by planetary boundaries that “ <i>are associated with the planet’s bio-physical subsystems or processes</i> ”. It allows considering that “ <i>crossing certain biophysical thresholds could have disastrous consequences for humanity</i> ” (p. 472).	Rockstrom et al. (2009)
<i>Sustainable intensification</i>	It argues that to meet “ <i>the food security challenge of the next fifty years</i> ”, production will need to be increased. Such production growth will have to be realized “ <i>from existing agricultural land</i> ”, through sustainable practices and by applying “ <i>a broad range of tools and production methods to achieve these goals</i> ” (p. 4).	Godfray and Garnett (2014)
<i>Agroecology</i>	Agroecology “ <i>provides the basic ecological principles for how to study, design, and manage agroecosystems that are both productive and natural resource conserving, and are also culturally sensitive, socially just, and economically viable</i> ” (p. ix).	Altieri (2018)
<i>Circular Economy</i>	“ <i>Circular economy is seen as a new business model expected to lead to a more sustainable development and a harmonious society</i> ”. It “ <i>promotes a more appropriate and environmentally sound use of resources aimed at the implementation of a greener economy</i> ”, “ <i>innovative employment opportunities</i> ”, “ <i>improved wellbeing and evident impacts on equity within and among generations in terms of both resource use and access</i> ” (p. 12).	Ghisellini et al. (2016)
<i>Nexus approaches</i>	“ <i>The nexus approaches highlight the need for and potential benefits of taking a broad, multi-sector, multi-scale and multi-regional perspective to solve global challenges, such as those related to the SDGs</i> ” (p. 474). They help “ <i>identifying positive synergies and negative trade-offs</i> ”, enhancing “ <i>sustainability pathways through promoting higher resource use efficiency, lower production of pollutants and wastes, and more coherent policy</i> ” (p. 466).	Liu et al. (2018)
<i>One Health</i>	“ <i>The ‘One Health’ concept states simply that there should be a seamless interaction between veterinary and human medicine with clinicians, researchers, agencies and governments working together for the benefit of domestic and wild animal and human health and the global environment</i> ” (p. 1).	Day (2011)
<i>Sustainable diets</i>	The Sustainable diets concept calls for “ <i>a broader perspective on the impact of diet on health</i> ”. It argues that “ <i>a more complex approach to both health and environment inevitably requires the insertion of other factors such as social, economic, ethical and governance element of diet</i> ”, and that “ <i>Sustainable diets...have to adopt a ‘multicriteria’ framework of thinking</i> ” (pp. 1-2).	Lang and Mason (2018)
<i>Food Environment</i>	“ <i>It includes all physical and social aspects that influence what, where, how, and when we consume our food as well as government policies influencing food production, food prices, food taxes, and food marketing</i> ”. It also involves “ <i>other economic factors such as income, unemployment, poverty, food insecurity, and food assistance programs</i> ”, as well as “ <i>nutrition and obesity</i> ” issues (p. 163).	Dharmasena et al. (2016)

Appendix C – Policy instruments relevant to food and corresponding policy acts with reference to Europe

Policy domain	Code	Policy instruments	Policy acts
Agriculture and rural development	1	Agri-environment payments (RD)	Art. 28 Reg. 1305/2013 on rural development
	2	Cooperation measures (RD)	Art. 35 Reg. 1305/2013 on rural development
	3	Common Market Organisation and external trade	Reg. 1308/2013, WTO agreement on agriculture
	4	Compensation payments to farmers	Reg. 702/2014 declaring certain categories of aid in the agricultural and forestry sectors and in rural areas compatible with the internal market in application of Articles 107 and 108 of the Treaty on the Functioning of the European Union
	5	Direct payments	Reg. 1306, Reg. 1307/2013 on direct payments to farmers
	6	Farm investment support (RD)	Art. 17, Reg. 1305/2013 on rural development
	7	Fruit and milk schools' scheme	Reg. 2016/791, Reg. 1308/2013 Common Market Organisation
	8	Greening and cross compliance	Art. 43 Reg. 1307/2013 (Payment for agricultural practices beneficial for the climate), and Reg. EU 639/2014; Reg EU 641/2014
	9	Organic farming and labelling of organic products	Reg. 834/2007 (repealed by Reg. 2018/848, will be in force in 2021)
	10	Promotion campaigns for agri-food products	Reg. 1144/2014
	11	Promotion of organic food (RD)	Aid for marketing and promotion co-financed under national rural development programmes
	12	Quality products promotion and farmers' participation (RD)	Art. 16, Reg. 1305/2013 on rural development
	13	Quality schemes (PDO PGIs)	Reg. 1151/2012, General marketing standard for all agricultural products and the adoption of place-of-farming (see “Labelling Policy”) and other sectoral rules for marketing products;
	14	Advisory services (RD)	Art. 15, Reg. 1305/2013
	15	Support to Short supply chains	No acts specifically directed to short food chains. Other relevant policy tools: Leader programmes, Small farm processing rules, flexibility in hygiene rules, localized public food procurement, trading rules, territorial quality support
	16	Small farmers scheme	Reg. 1307/2013
	17	Unfair trading practices	Proposal for a Directive on unfair trading practices in business-to-business relationships in the food supply chain COM/2018/0173 final, The communication suggests three tools: support for the voluntary supply chain initiatives. Use of EU-wide shared good practice principles; ensure effective national enforcement; minimum enforcement standards

Environment	18	Circular economy (waste)	Directive (EU) 2018/849 on end-of-life vehicles, batteries and accumulators and waste electrical and electronic equipment, Directive (EU) 2018/850 on the landfill of waste, Directive (EU) 2018/851 on waste, Directive (EU) 2018/852 on packaging and packaging waste
	19	Coastal and Marine policy	Reg. 1380/2013, fisheries maximum sustainable yields
	20	Drinking safe tap water	Water framework directive Directive 2000/60/EC of the European Parliament and of the Council. Proposal for a revision to the Directive 98/83/EC of 3 November 1998. Municipal competence in implementation
	21	Food education (waste reduction)	National and regional education policies
	22	Green public procurement	Communication 400 (2008) Public Procurement for a better environment
	23	Nitrates directives	Council Directive 91/676/EEC, Water Framework Directive, National Emission Ceiling Directive
	24	Soil protection policies	No EU Soil protection policy, only few MS have it. CAP agri-env measures, cross-compliance contribute to it.
	25	National emission ceiling	Directive (EU) 2016/2284 indicating monitoring obligations on emissions from agriculture
	26	Biodiversity strategy (linking to RD measures for agriculture)	EU Communication COM/2011/0244 final
	27	Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan	Communication of the Commission Brussels, 16.7.2008 COM(2008) 397 final
Health	27	Animal welfare labelling	Compulsory only for eggs Council Directive 1999/74/EC, other initiatives are voluntary
	28	Anti-microbial resistance	A European One Health Action Plan against Antimicrobial Resistance (AMR)
	29	Contaminants	Regulation 315/93/EEC, Maximum levels for certain contaminants in food are set in Commission Regulation (EC) No 1881/2006.
	30	Country of Origin Labelling	National measures on country of origin labelling, Reg. 1169/2011
	31	Food contact materials and packaging	Regulation 1935/2004
	32	Dietary guidelines (e.g. Mediterranean diet)	School food standards, food based dietary guidelines, dietary reference values, and nutrient profiling scheme. Most of the guidelines issued in the EU are targeted at schools but many also exist for hospitals, workplace canteens as well as sport clubs and others.
	33	Food labelling	Reg. 1169/2011
	34	Food for specific groups	The Regulation (EU) No 609/2013 on food intended for infants and young children, food for special medical purposes, and total diet replacement for weight control
	35	Fortification	Reg. 1925/2006 and Reg. 108/2008.
	36	General food law	Regulation (EC) No 178/2002, White Paper on Food Safety

	37	Gluten labelling	Reg. 828/2014 of 30 July 2014 on the requirements for the provision of information to consumers on the absence or reduced presence of gluten in food
	38	GMO rules for food and feed	Regulation (EC) 1829/2003
	39	Hormones in meat and residues	Directive 96/22/EC as amended by Directive 2003/74/EC
	40	Hygiene package	Reg. 852/2004 (HACCP), Reg. 853/2004
	41	Nutrition and Health Claims	Reg. 1924/2006
	42	Nutrition, overweight and obesity strategy	White Paper A Strategy for Europe on Nutrition, Overweight and Obesity related health issues
	43	Pesticides	Directive 2009/128/EC , National Action Plans, Maximum Residues Levels, Article 12 of Reg. 396/2005.
	43	Registration, certification, marketing equivalence rules for seeds	The Seed Marketing Directives are based on article 37 TFEU (free movement of goods) There are 12 basic Council Directives: One horizontal Directive 2002/53/EC - common catalogue of agricultural plant species; 11 vertical Marketing Directives.
	44	Traffic light labelling	Not in force, it is being opposed by PDO PGI quality products in EU
Justice, consumer, education and culture	45	Support to consumer groups	Not in force
	46	Food education	National school food policies
	47	Children Food advertising	The Audiovisual Media Services Directive (Dir. 2010/13/EU), Self and co-regulatory codes of practice, Private initiatives
	48	True cost pricing and price monitoring	EU Food Prices Monitoring Tool
Competition, Trade	49	Rules on food recovery and redistribution	National regulatory initiatives (e.g. Italy, France), EU guidelines on food donation
	50	Agri-food trade	Reg. 1308/2013 Common Market Organisation, WTO agreements on agriculture, Reg. 510/2014 laying down the trade arrangements applicable to certain goods resulting from the processing of agricultural products. EU Trade for all strategy (http://trade.ec.europa.eu/doclib/docs/2015/october/tradoc_153846.pdf)
	51	Competition policy	Articles 101, 102, 106(1), 107, TFEU. Regulation 1/2003 'Regulation on the Implementation of the Rules of Competition in Articles 81 and 82 of the Treaty' 'Commission notice on immunity from fines and reduction of fines in cartel cases'. Three sets of tools concern food: 1) Derogations to the general legislation 2) Decisions adopted by the Commission with respect to actual cases. 3) Market monitoring actions by national competition authorities.
	52	State aid in agriculture and forestry	Reg. 702/2014 declaring certain categories of aid in the agricultural and forestry sectors and in rural areas compatible with the internal market

	53	Import tariffs, quotas , non-tariff barriers	Multilateral trade agreements (WTO); Bilateral trade agreements (CETA; South Korea), Free Trade Area, Economic Partnership Agreements, Reg. 510/2014 laying down the trade arrangements applicable to certain goods resulting from the processing of agricultural products
	54	Intellectual Property Rights (Geographical Indications)	As above
	55	Fair trade	Private initiatives
Internal market, industries, SMEs	56	Social responsibility	Social public procurement (Buying social)
	57	Public procurement	Directive 2014/24/EU
	58	Footprinting	Private initiatives
	59	Retail zoning and commerce licensing	National and local initiatives
	60	Corporate social responsibility;	EU Commission strategy on CSR, multi-stakeholder forum, Global Compact
	61	Information and communication, advertising	EU platform for Action on Diet, Physical Activity and Health, EU Pledge and National initiatives
	62	Food taxation measures	Implemented in some countries. Debate ongoing on impacts on competitiveness and consumption
	63	Support to food business and agro-tourism (RD)	Art. 35 (Co-operation), Reg. 1305/2013
	64	Private standards	Private initiatives
Employment	65	FEAD (food aid)	Reg. 223/2014, National Managing Authorities
	66	Illegal employment prevention	International Labour Standards, national competence
R&I	67	'Nudging' tools (warnings, reminders, feedbacks)	Not available
	68	Knowledge on healthy diet options	Joint Research Center on food and healthy diets
	69	LIFE program_ environment and climate action	Regulation (EU) No 1293/2013, multi annual work program 2018-2020
	70	H2020 projects	EU Comm COM/2011/0808 final establishing H2020, Work programmes 2014-5, 2016-7, 2018-2020
	71	EIP Agri, RD policy	Reg. 1305/2013
	72	Bioeconomy	Standing Committee on Agricultural Research (SCAR)
	73	Smart development	Smart Specialization Platform on Agri-food
Others	74	Urban agriculture and short food supply chains	(partly) Community Led Local Development tools (Cohesion policy), Reg. 1303/2013 common provisions on funds
	75	Urban food planning	Not available

76	Infrastructure and transportation of food	Not available
77	Support to small farm processing	National and regional regulations and initiatives

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