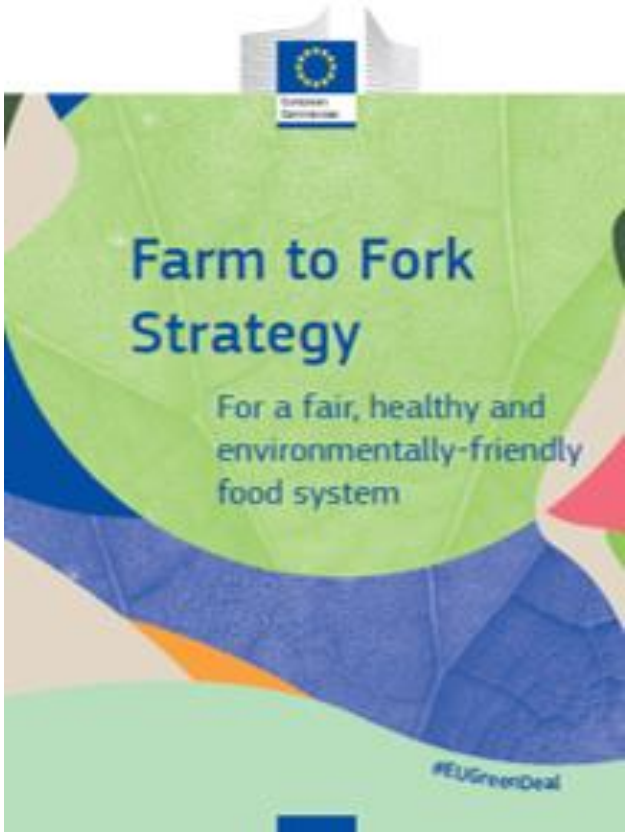


# SEEDS OF TRANSITION?

A Critical Discourse Analysis of Transition
in the EU Farm to Fork Strategy
from the Perspective of Cultivated Diversity

THESIS FOR THE MSc ORGANIC AGRICULTURE – SUSTAINABLE FOOD SYSTEMS

**Wageningen University and Research**
**Sociology of Development and Change Group**

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Supervisor: Dr ML Schneider

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[1] This tile is borrowed from, and inspired by, Wiskerke and van der Ploeg (2004)

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# 1 INTRODUCTION

The European Union wants to be climate neutral by 2050 and published, in the context of its Green Deal, both a Biodiversity and a Farm to Fork Strategy, which aim respectively at transformative change, with nature restoration as a central element of the EU economy (European Commission, 2020b) and a just transition to sustainable food systems (European Commission, 2020a).

The Strategies were launched amidst broader concerns about biodiversity loss that have been informing research for decades and were formalised at the policy level in the 1992 UN Convention on Biological Diversity (CBD), which also makes the connection between biodiversity and human wellbeing by acknowledging:

> […] the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components,
>
> […] the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere. (1992)

The value of biodiversity is particularly felt in the context of accelerating climate change: the latest IPCC report *Climate Change 2022. Impacts, Adaptation and Vulnerability* recognises the "interdependence of climate, ecosystems and biodiversity, and human societies" (2022, p.7), observing that biodiversity is impacted by climate change and, at the same time, the ecosystem integrity linked to biodiversity may help counter its worst effects (ibid, p.34).

Food systems have a particular role to play in sustaining biodiversity as the production of food affects the landscape as much as it is affected by it, and protecting (agro)biodiversity, the diversity in and around fields - wild and cultivated – must be part of our efforts to mitigate the impact to climate change and adaptation to its consequences (see for example IPES-Food, 2016, p. 31-36; Chable et al, 2020, p.2). Such diversity does not happen by itself, it needs creating and nurturing through practices that support it and relationships with the landscape that value it, as argued by transdisciplinary researcher Montenegro de Wit (2016). Such practices have been called agroecological, as they recognise and enact ecological principles, and they are now widely recognised for their effectiveness (Alberdi et al, 2020). The IPCC report itself indicates that "[e]ffective adaptation options" for climate change should be based on "[a]groecological principles and practices" (2022, p.23), and receive institutional support. The Farm to Fork Strategy, as a policy document (read in conjunction with the Biodiversity Strategy), could fulfil this institutional support role in the EU, so my objective is to ascertain whether it does.

In order to do that, I embrace the perspective of cultivated diversity, which views seeds as an essential input in farming, but more than that as the embodiment of biodiversity for their potential to produce diverse, nutritious food and other useful produce for societies. Seeds are also artefacts which co-evolve with humans through socio-cultural and economic practices that create landscapes, among which is farming. Through such practices, and the values and imaginings that generate them, communities interact with biodiversity.

For their importance in our societies, seeds as artefacts also have a political value, and as such they have been used as an instrument of power to impose limits on the agency of farmers, which resulted in hampering their role as custodians of the landscape and the biodiversity that lives in and around them (Müller, 2014).

During my MSc internship with the Italian "hub for food system biodiversity" Rete Semi Rurali[2] in early 2021, I had the opportunity of contributing to some of their communication activities about cultivated diversity while experiencing how the cultivated diversity perspective shapes and motivates some European networks of farmers, seed savers and academics who advocate for reforms to the EU legislation. Their efforts focus on positioning the diversity of seeds back at the heart of farming, to counter and reverse the impacts of both the industrialisation of agriculture and increasing concentration of power in the hands of corporations. It is that personal experience that inspired me to look at the Farm to Fork Strategy a policy document that promises to enable a transition to just and sustainable food systems and has been lauded for its ambitious approach.

The Farm to Fork Strategy attracted my attention for two reasons. On the one hand, the document purports to facilitate a transition to sustainable food systems. I set it as my objective to analyse the claims made in the document for their potential to achieve change; I adopted the method of Critical Discourse Analysis, out of the toolkit of interpretive policy analysis, to look at the text and the discourses surrounding it.

On the other hand, regardless of its claims, I identified the Strategy as a step in the wider historical transition that, in its attempt to address the shortcomings of the Green Revolution and industrialisation of farming, has led us to the contemporary focus on 'sustainable agriculture'. As a policy artefact, the Strategy was created in response to, and in order to address, the dual pressure of climate change and biodiversity loss affecting mainstream agriculture on the one side, and the increased visibility of and popular support for alternative ways of farming that developed in opposition to mainstream agriculture on the other. The Strategy thus reacts to and takes a stand on a process of ongoing change. That is why I adopted the Multi-Level Perspective of Socio-Technical Transitions (MLP): to gain a clearer understanding of the transformational processes that bring about system change. The MLP is a middle range theory that analyses change as the interaction of three different levels, first of which is the *niches* where the seed of change is sown. The second level is the *regime*, which upholds mainstream values and practices, and may resist change in so far as it challenges its established power structures. The last level is the *landscape*, a layer external to the system under scrutiny, but represents what happens around it more broadly, so it has an impact on how the regime and niche develop.

Applied to the Farm to Fork Strategy and its context, the MLP framework identifies climate change and biodiversity loss as part of the wider landscape that is putting pressure on the regime in favour of change. The biodiversity-supporting niche, on the outside of mainstream agriculture, has long ago sown the seeds of transition. I am referring here to the heterogeneous group of innovative farmers and their allies, operating at different levels of the supply chain and in different regions, alone or joining together in networks that advocate for change in agriculture, at the same time as they strive to bring it about by adopting agroecological principles and practices. Among them are those I met through my internship: Rete Semi Rurali, the European Coordination Let's Liberate Diversity that they actively contribute to, and all their colleagues across Europe working on EU funded projects that research and advocate for cultivated diversity. This expanding group of

[2] Rete Semi Rurali https://rsr.bio/en/about-us/vision-and-mission/

advocates and practitioners has acquired enough momentum to challenge the regime of industrialised agriculture and its productivist model that focusses exclusively on yield and profit (Anderson et al, 2020, p.36): it has become what some have termed a *niche-regime.* Between the changing landscape on one side - where the discourse about biodiversity conservation and agroecology are gaining ground for their potential to address and mitigate the impact of climate change - and the biodiversity-supporting niche-regime, sits the Farm to Fork Strategy: created by the regime but potentially opening a window of opportunity for the niche to break through.

Through my thesis I set out to investigate how the regime has responded to being challenged and whether the Farm to Fork Strategy heralds the change advocated by the cultivated diversity niche.

## 1.1 RESEARCH QUESTIONS

I approached the Farm to Fork Strategy asking myself:

*Is the Strategy opening a window of opportunity for biodiversity-supporting farming to replace industrialised agriculture, and is it actually leading a transition to biodiversity-supporting agriculture?*

In more detail, I explored the following aspects of transitional change, to assess the likelihood of success of the Strategy's claims:

- How does the Strategy define 'sustainability', the goal it is trying to achieve?
- What transformational trajectory is the Strategy aiming for, that is: what problem is it trying to solve and how?
- What relationships of power are going to determine the outcome of the transition?
- What narratives and framings are leveraged to define the direction of the transition?
- What impact does the relationship between discourse and practices represented in the Strategy have on the transition?

## 1.2 SUMMARY OF THE FINDINGS

The Farm to Fork Strategy has been praised as a first effort to take a longer term, food systems approach rather than looking at food and agriculture through policy silos and within political terms, among others by food sovereignty scholars Alberdi and colleagues, who collectively provided feedback in response to its publishing. Together with the Biodiversity Strategy, the Farm to Fork has also been listed among "some of the world's most ambitious efforts to catalyse a food system transition" (Candel, 2022, p.296), challenging established narratives about feeding the world (Duncan et al, 2022) and setting ambitious targets (Mowlds, 2020, p. 20).

The Farm to Fork Strategy has responded to advocacy for a systems approach to food and agriculture (for example IPES-Food, 2019) and as such it is a rather extraordinary agenda-setting exercise for the European Union. Given the complexity of food systems, in fact, a system approach alone provides a consistent vision for change, leveraging synergies in its pursuit (ibid, p.11). The Strategy is also among the first attempts at transforming food systems, comprehensively, in the direction of sustainability, and it has certainly set an example if the recent USDA press release announcing a transformation of the food system in the US (2022) is anything to go by.

However, an analysis of the text against the principles of sustainability transition management reveals that the Farm to Fork Strategy is not advocating for transitional change, rather promoting a trajectory adjustment to the current paradigm of industrialised productivist agriculture, rooted in economic growth, the dominance of the market and fuelled by technological innovation, an adjustment in terms of "green growth" (Lennan et al, 2020) and the sustainable intensification of agriculture.

In the vision that can be inferred from the Strategy, farmers are not custodians of the landscape and the biodiversity in and around it, skilled and resourceful producers of food, rather somewhat failed businessmen, who need support to be kept afloat in the economy: permanent losers in the ongoing modernisation of agriculture. Citizens and communities are mainly seen as consumers of food products (Alberdi et al, 2020), which the market will have to try and provide with the least environmental footprint possible. The Strategy identifies in fact the main environmental problem in GHG emissions and the solutions it proposes are technology-focussed and targeted at cutting those. The protection of biodiversity is delegated to the Biodiversity Strategy, which does a better job of making the connections between climate change and farming, farmers and biodiversity, farming practices and the landscape and recommends the adoption of agroecological practices.

In terms of the seeds themselves, the Farm to Fork Strategy remains within the genetic resources tradition, an approach which has led to uniformity in food and landscape and concentration in the seed industry, whose latest battle is being fought in the biotechnology arena. Even if the Biodiversity Strategy places more value on the diversity of seed than the Farm to Fork, it does not go as far as to support cultivated diversity. However, the European Coordination Let's Liberate Diversity, a network of biodiversity-supporting advocates, has defined the Strategies a "relative success for crop biodiversity" (2020a) and takes the recognition of seed diversity in the Strategies as their new starting point for further advocacy, in the permanent socio-political battle that, quoting Van der Ploeg, is effort to promote an increasingly convincing alternative to the regime (2021, pp. 292-293).

Although the Critical Discourse Analysis I performed suggests the Farm to Fork to be a regime tool, remaining fundamentally within regime paradigms, the context around its publishing is more complex and regime and niche characteristics overlap in places, what Elzen and colleagues define an *hybrid forum* (2012), which allows for qualified optimism that the Strategy has in fact opened a window of opportunity for the biodiversity-supporting agriculture niche-regime, with cultivated diversity advocates in its midst. It has worked as a form of institutional anchoring, at least at the discursive level, albeit with a tenuous impact on practice. In the following chapters, I describe how I came to such an understanding of the matter.

# 2 CULTIVATED DIVERSITY: THE PERSPECTIVE

As I approach my task of performing a Critical Analysis of the EU Farm to Fork Strategy, a policy strategy aiming to advance sustainable food systems, I come at it from the fundamental perspective of one of farming's most essential component parts: seed.

I look at seed through the ecological framing of *cultivated diversity*, a concept proposed by Chable and colleagues (2020) while working on EU funded project DIVERSIFOOD (see Table 2) and that was then taken forward by the international network of practitioners and advocates that goes by the name European Coordination Let's Liberate Diversity! or EC-LLD (https://liberatediversity.org), which was created to formalise relationships previously established during EU-funded projects under the banner "use it or lose it".

In contrast to industrial farming this perspective does not look at seed as an input rather, it interprets seed as an artefact that coevolves with the environment it is grown in, and with the communities it is grown by and for. Seeds are the tools with which farmers experiment and which they shape in order to develop mutually advantageous relationships with the ecological processes in the landscape and with non-human nature, in the process of producing food. In this process, sustainability is ensured by diversity, which also enriches the communities that rely on it. As diversity is dependent on the landscape in which it grows in interaction with other diversity, and influenced by the choice of human practices, it is essential that such practices respect and nurture it: in the words of development sociologists Schneider and McMichael: "human and non-human processes interact to mutually constitute nature" (2010, p.476). Farmers role becomes therefore that of custodians of agrobiodiversity (Chable et al, 2020, p. 5), which they perform by adopting agroecological practices. Thus, beyond the seed itself, this perspective takes into account the "agricultural, economic and ethical choices" that make a seed what it is (Bocci & Chable, 2009, p. 82) through the practices with which it is bred and grown on a farm. Such farming practices can in turn only exist in the context of socio-cultural and economic practices that value diversity within rural communities and throughout food supply chains.

**Cultivated divers ity: my perspective**

- far from being exclusively a genetic resource, seed forms part of wider socio-economic and cultural-ecological interactions between farmers and their communities; the diversity of seed is the outcome of interactions that value diversity;
- farmers have historically maintained, and should continue to maintain, genetic diversity in and around the seed as custodians of the landscape, taking a proactive role in the management of seed, and being recognised and rewarded for their skills and efforts;
- practices to breed and grow seed determine its diversity and that of its surroundings: localised, distributed, knowledge intensive, in synergy with the rest of the ecosystem, these are often termed agroecological.

*Box 1 Cultivated diversity: my perspective*

However, the way seed has been bred and grown has not always supported diversity, in and around the fields, even as biodiversity might have been valued, by those negatively affecting it. In this opening chapter, I look at how mainstream farming has lost sight of diversity, in the transition that

was the rise of *modern seed*, then I describe how resistance developed that wanted to restore seed and biodiversity at the heart of farming and in the hands of farmers.

In order to set the context for my perspective, I expand on agrobiodiversity and its dimensions. Then, I briefly discuss how discourse about seed has underpinned processes of change, including to the role and rights of farmers, and to farmers' view of farming, before moving on to trace the changes in plant breeding and farming that have led to unsustainable uniformity in the landscape, setting the scene for the transformational change that I discuss in the next chapter. My whole thesis, in fact, looks at farming within the framework of socio-technical transitions: fundamental transformations of societies originating in a set of political and technological choices.

## 2.1 AGROBIODIVERSITY AND ITS DIMENSIONS

Plants that propagate vegetatively rather than from seed, for example through tubers, bulbs, corms and stolons, or that are propagated with cuttings, are all genetically identical to the parent plant[3]: they are its *clones*, and the same applies for plants reproduced in vitro from cells in a lab (micropropagation). From an economic point of view, the uniformity of clones is considered a benefit, in that the characteristics that were appreciated in the mother plant are reproduced in all the propagules derived from it. As identical plants require the same inputs and maintenance routines, and can be processed with industrial machinery, the supply chain that deals with them can improve efficiency and costs go down. Breeding identical plants also offers financial advantages from minimisation of risk. For example, fruit plants take years to grow from seed to food production; caring for them without knowing if the so-called quality of the produce (i.e. flavour, texture, visual appearance) will be acceptable to consumers is a risky investment.

From the environmental point of view, however, uniformity in the fields and the industrial methods that reap benefits from it have devastating consequences. Identical plants only thrive within the same conditions and are susceptible to pests, diseases and disorders in the same way. The economies of scale that benefit the supply chain result in large-scale vulnerability, and such vulnerability can have devastating economic consequences for farmers. Uniformity in human diets also has negative consequence on nutrition and wellbeing (see IPES-Food, 2016). That is where the socio-ecological role of seed becomes of importance.

*Crops propagated from seed*, through sexual reproduction from parent plants, have in fact some level of genetic diversity as each plant carries a unique combination of genes from both parents that gives them specific and unique characteristics. *Genetic diversity* is however just one of the three dimensions of *crop biodiversity* in cultivated fields. The other two dimensions are:

- *Diversity of varieties*, for example red and green apples
- *Diversity of species*, for example apple and onion

*Agricultural biodiversity*, or *agrobiodiversity*, in its wider definition "includes those components of biological diversity relevant to food and agriculture as well as the components of biological diversity that constitute the agro-ecosystem," (Frison et al, 2011, p. 239), or the wider diversity of plants and animals in the agricultural landscape, managed or unmanaged. Through their interactions, these provide stable environments and functioning *ecosystem services*, such as clean water and rich soils.

[3] except in the rare cases where some natural mutation occurs

In the next section I describe the agricultural dimensions of diversity.

### 2.1.1 The agricultural dimensions of diversity: seed and diversity in the fields

> Crop diversity - variation among crop species, their varieties and/or individual plants - underpins the productivity, resilience and adaptive capacity of agricultural systems. (Khoury et al, 2021, p.2)

On the farm, a diversity of plants grown for food means, generally speaking, that the landscape is more intensively[4] and closely managed, as diverse landscapes are not suited to automation and machinery, resulting notably in less stress on the soil. When such management follows agroecological practices, for example through mixed farming with crops, livestock and agroforestry (ibid, p.244), better *sustenance for wild biodiversity* is provided at the landscape level (including in the soil), which in turn improves so-called *ecosystem services*: the benefits we derive when ecosystems function as they should. Namely, pests and diseases wreak less havoc in the fields and resources such as water may be better shared and utilised according to the diverse needs of different plants. This type of farming is also knowledge-intensive, and as such it is believed to improve job satisfaction for farmers (IPES-Food, 2016, pp. 31-37).

In more detail, diverse (agro)ecosystems, where diverse species grow, have been observed to have *higher overall productivity* even when the productivity of the single species is less, as species "occupy different ecological micro-niches and make differential use of resources." (Frison et al, 2011, p.240) For example, intercropping (growing of different crops in proximity) is known to be beneficial to some species that have complementary needs, or where one plant stimulates the growth of another by mitigating abiotic stresses or activating some ecosystem service, as is the case when chickpeas mobilise phosphorus in the soil that wheat and maize can then absorb more easily to grow and thrive (ibid, p.241).

Diversity, at all levels, also favours *stability of yield when the growing circumstances are not optimal* (ie drought or excessive wet weather): diversity of genetic traits in one variety, a mix of varieties or a mix of crops (ie agroforestry where trees are grown alongside field crops, or intercropping) can be more successful under stress. In fact, while some plants or crops will fail, the most adapted plants or crops in the mix will still produce some yield, thus reducing the financial risk for the farmer. Different varieties grown in the same area may also extend the cropping season, which means farmers can sell their produce over time. Besides, different varieties can be utilised for different culinary and traditional purposes, possibly fetching a price premium.

The *impact of pests and diseases* may also be mitigated by diversity at all levels, through natural mechanisms, for example plants grown in mixes provide better "distance between susceptible plants and physical barriers to transmission" (ibid, p. 242). Diverse environments also host a variety of pathogens, which sometimes fight among themselves, which "reduces disease severity" (ibid). Moreover, the evolution of pathogens is slowed down in diverse environments where they cannot spread as easily. In such circumstance, crops can be managed with fewer external inputs, such as pesticides, which in turn ensures better outcomes for non-target species, for example pollinators.

[4] "Agroecological systems are knowledge, management, and labor intensive rather than input intensive and aim to regenerate long-term agroecosystem properties (soil health, water storage, pest, and disease resistance) leading to sustainable, resilient systems" (Kremer, 2015, p. 16)

"All of the mechanisms cited above contribute to *resilience* - the way in which an ecosystem responds to and recovers from disturbance - which has been attributed to the degree of connectivity within an ecosystem" (ibid, p. 244), that is ecosystems are more resilient when they can connect in wider networks, including through diverse agricultural landscapes that act as corridors in between wild nature. In conservation, this is referred to a *land sharing* approach that argues for the coexistence of farming with non-human nature (see Kremen, 2015).

Diversity in food crops further improves *health and wellbeing*, directly and indirectly, as it is "a foundational pillar for food security, nutrition, and dietary quality. It is the basic source of variety in essential foods, nutrients, vitamins and minerals, and medicines, and underpins life-sustaining ecosystem services" (Fakhri, 2022, p. 4). Reduced use of agrochemical inputs and healthier soils, characteristics of diverse farming, contribute to more nutritionally dense and less contaminated food for consumers (IPES-Food, 2016, p.39-40) and improved health for the farmers.

If cultivated diversity provides such benefits, then agriculture that is sustainable cannot but be biodiversity-supporting. That means that diversity must be cultivated in the field, including through plant breeding practices that produce seeds that can work with and within the environment that surrounds them, in place of needing agricultural inputs to thrive.

Cultivated diversity requires in fact plants that are resilient, for example whose roots are deep enough to catch water and nutrients (Nuijen et al, 2020, p.33), plants that thrive rather than suffer in complex systems such as intercropping and agroforestry (ibid, p. 38) and heterogeneous mixes of varieties that can dynamically respond to the conditions in the fields (ibid. p. 33). *Seed needs to be bred specifically* for these purposes (rather than for uniformity, as is required by industrialised farming where machines are used to plant, cultivate and harvest). That means that in defining the characteristics the seed needs to carry, both the local environmental conditions and the management practices farmers use in their fields need to be taken into account.

This in turns requires that *farmers take an active part* in seed breeding on their farms. This is often referred to as in-situ conservation, or more precisely, dynamic or on-farm management (Demeulenaere, 2014, p. xv). Even where seed is produced off farm, farmers participation will be essential so that to reach farmer a nimbler seed industry than centralised corporations (see Figure 3) will be needed, that can breed both varieties that are diverse (like open-pollinated ones) and more diversity of varieties, thus *smaller quantities of more narrowly adapted seed for smaller markets*.

### 2.1.2 Discourses and practices of biodiversity loss and biodiversity creation

Biodiversity has been declining, in and around the fields, as a consequence of uniformity being one of the characteristics of industrialised agriculture and modern seed (discussed in details later, see also Box 2). The extent of the decline in biodiversity is a topic of lively discussion in the literature, together with its possible impacts: "it remains unclear to what extent the onset of modern breeding efforts has really affected diversity levels in crops", according to research on genetic erosion done in Wageningen (van de Wouw et al, 2009, p3). Another recent paper concludes that "[c]rop diversity may be decreasing, being maintained and increasing, all at the same time, in different forms and at different scales" (Khoury et al (2021, p.19) and the impact of such changes is also unclear.

Nonetheless, alongside the mainstreaming of industrialised agriculture, a narrative of biodiversity loss has established that underpins extant power structures. This narrative is rooted "in a neo-Malthusian logic, where scarcity provokes solutions of streamlining and efficiency", which has led to

legitimising "the very existence of seed banks" where seed, in need of salvation according to the rhetoric, is preserved according to a "system of scientized expertise" – says political ecologist Montenegro de Wit (2016, p. 634). In reality, what is lost is agrobiodiversity in the fields: "the role of farmer labor, farmer knowledge, landscapes, and ecology as active participants in conserving – or, more aptly, regenerating – agrobiodiversity" (ibid), including through breeding diverse seed.

To promote the alternative route of on farm dynamic management of seed, or cultivated diversity, and create the societal conditions necessary for it to thrive in, then

> agrobiodiversity needs to be understood in political, agroecological terms: not just as something that 'exists' but that is *created and sustained*; and not just as something that is lost (or that persists) globally but as something that is bred, experimented with, and used at multiple scales. (ibid, p. 638)

Khoury and colleagues agree that countering the current process of increasing uniformity across landscapes will require "profound change" in agriculture, a reorganising "of food systems, and even the human societies they nourish, to become diversity-supportive processes" (2021, p. 20). As practices reflect values, in fact, farmers and communities need to value biodiversity, so that they can nurture it and thus enable a successful transition to sustainable food systems.

But what does valuing biodiversity look like? Schneider and McMichael, discussing how to "restore forms of agriculture that are environmentally and socially sustainable" (2010, p.461) argue that the human separation from nature that accompanied the industrialisation of agriculture under capitalism has resulted in "epistemic consequences" (ibid, p.462) that may prevent us from achieving "ecological futures" (ibid, p.480). The way in which we view biodiversity as something that is external from us, rather than something we nurture and create - as highlighted by Montenegro de Wit - is one of those consequences. To me as horticulturist who tries to nurture and create diversity in green spaces, this 'rift' has materialised in opposition on aesthetic grounds: uniformity in the landscape may not be interpreted as a problem rather as a feature of good farming practices, while diversity - the essence of sustainability - may look like the outcome of laziness and untidiness. Taking care of the epistemic dimensions of diversity will create the context in which diverse seed has a reason to exist, that is why in the next section I want to explore how farmers and farming communities look at landscapes, diversity and their role in relation to them.

Of course, it is not only farmers and farming communities that need to view and imagine food and landscapes through a diversity lens. As farmers are to breed and grow diverse and non-uniform crops, they need supply chains with the right "technologies and artifacts" for processing and preserving diverse produce and customers that have the "food skills and competencies" for preparing meals with them (Hinrichs, 2014, p.150). EU-funded projects on cultivated diversity (i.e. DIVERSIFOOD, see Table 2) have highlighted the need for whole supply chains to shift from standard approaches and expectations (including the looks of food itself) to embrace diversity.

### 2.1.3 The sociocultural dimensions of diversity: good farming and diverse landscapes

Agrobiodiversity needs to be understood in the context of social and cultural factors "and aspects of culture such as identity and symbolic meaning" says rural geographer Burton (2004, p. 212), as these aspects reflect in farming practices, and farming practices reflect on the landscape. Because farms are "a permanent 'front stage' activity" (ibid, p.201), under the scrutiny of both peers and

local community, farming practices that make the landscape are also the means through which social capital is earned, membership of a group secured, and community status established.

In order to support policymaking for change, therefore, various researchers (Burton, 2004; Hunt, 2010; Kohler et al, 2014) have studied farmers' understanding of what makes *good farming*. They concluded that the vision has normative character through internalisation, is shared by farmer and farming communities and is based on productivist values for historical as much as practical reasons, like the loss of profitability in farming linked to inequality in the market (see de Molina, 2013, p. 48):

> 'increasing yield' commonly provides the core of any definition of a 'good farmer' [...] whereas net income is to an extent dependent on forces outside of the farmers' immediate control, 'yield' itself measures only the husbandry ability of the farmer [...] Farmers may also use the appearance or general 'tidiness' of the farm itself as an indicator of nurturing ability, (Burton, 2004, p. 202-203)

and their own hard-working attitude, and seem therefore to

> have a penchant for landscapes that are neat, clean and ordered (ibid, p.201)

Noting such penchant for order even among organic farmers adopting multifunctional farming in France, Kohler and colleagues, wrote:

> [f]armers feel connected to nature. However, their perception that nature should be under human control, "clean and tidy", contradicts many aspects of conservation policies. (2014, p. 930)

Sociologist Hunt (2010), researching the relationship between farmers and their land, observed that nature was practically invisible to farmers who saw themselves as businessmen and farmed for financial return; at the opposite end of spectrum were farmers who saw themselves as innovators working in and with a positively stimulating environment, full of life. Not only that, but the look of their orchards provided farmers with "visual feedback [...] that their management practices were correct" (ibid, p.419), suggesting a strong connection between the interpretation of the landscape, the farmer's interpretation of its role within it and farming practices. He concluded:

> [a]lthough farmers may comply with agri-environmental schemes, they are not likely to change their practices across a whole farm unless they are able to visibly demonstrate their use of the skills and knowledge in ways that are acknowledged and rewarded with symbolic capital in their cultural communities, (ibid, p.417)

adding that the success of sustainability policies might depend on the availability of

> different models of good farming for farmers to follow in the same locality (2010, p. 425)

given the social and cultural investment in the peer group and communities. The conclusion is shared by Burton: faced with change, farmers may resist

> on the basis of an anticipated loss of identity or social/cultural rewards traditionally conferred through existing commercial agricultural behaviour:" (2004, p.196)

something that any policy that proposes transformation (i.e. the Farm to Fork Strategy) needs to take into consideration.

## 2.2 PLANT BREEDING AND SEED DISCOURSES

Seed, both in the botanical definition referring to a fertilised ovule, and in the more inclusive definition that refers to propagation material used in plant reproduction (for instance, stem or root cuttings), is how plants reproduce (and/or how plants are reproduced through plant-human interaction). Seed of the plants used in agriculture also have functions for humans as they provide food, feed for animals, fuel, fibres as well as medicines and building and crafting materials. The selection of seed that made cultivated plants marked human's transition from hunting and gathering to settled agriculture and accompanied us in our migrations across the world. In the words of political anthropologist Birgit Müller, they "coevolved with humans since the beginning of agriculture" as it is through seeds that humans "established their sensorial relationship to the soil, to the plants as they grow, to the weather". I concur with her, from my personal experience as a keen propagator, that seeds "are objects of pleasure, urge, and need" (2014, p.3).

Therefore, seed has acquired cultural, social and economic meanings. The important – though often unseen or made invisible - role of seeds in human life has also turned them into artefacts with political connotations and political economic uses. Quoting Muller again, seeds

> are simultaneously a meaningful part of the daily practice of many people involved in agriculture and mediators of power and control, acting as carriers of national and international food and agriculture policies and as instruments for imposing corporate control in the field of the farmer. (ibid, p.4)

I set out to explore and explain the instrumentalisation of seed in the rest of this chapter, and I start by describing how discourse about seed has been used to establish legitimacy for some actors and practices and not others, which is relevant to my research as the practices that became mainstream have impacted on the ability of farmers to perform their role as custodians of biodiversity.

The Food and Agriculture Organisation (FAO) of the United Nations - the global institution that since 1945 has been looking at food production and how it meets the world's nutritional and access needs, an institution that together with other UN agencies is often considered to be "neutral" (Pistorius, 1997, p.21) has a definition of seed on their website (reproduced also in Figure 1)

> Seeds are the primary basis for human sustenance. They are the repository of the genetic potential of crop species and their varieties resulting from the continuous improvement and selection over time.
>
> Crop improvement and the delivery of high quality seeds and planting materials of selected varieties to growers is necessary for ensuring improved crop production and meeting growing environmental challenges. Food security therefore is dependent on the seed security of farming communities. (2022)


*Figure 1 The definition of seeds on FAO website (FAO, 2022)*

Several assumptions underlie the FAO definition. First, seeds are a "repository of genetic potential," which implies a techno-scientific orientation. Second, they lend themselves to "improvement" to make them "high quality" – the meaning of which is further detailed in a linked video (FAO, 2020), where they are also referred to as "the right seeds" and "improved crop varieties." Third, such improvement comes through human intervention, but not anyone's intervention, as growers are seen as passive recipients to which seeds are "delivered." We can infer from the only other picture on the page (reproduced in Figure 2) that high quality seeds are produced by technicians in a laboratory by making use of "advanced technologies".


*Figure 2 Image representing the breeding of better crop varieties on FAO website (FAO, 2022)*

The language used by FAO, therefore, is far from neutral or impartial, rather it originates from an approach that science historian Bonneuil - writing about the semantic history of biological diversity and related practices - defines *genetic modernism*, which from the end of the 19th century started looking at seeds as *genetic resources*, rather than artefacts coevolved with rural communities. The genetic resources approach, borrowing from chemistry (Mueller-Wille, 2007, p.800) rather than ecology, framed diversity in a reductivist fashion as an assemblage of traits in plants determined by individual genes, which could be optimised to underpin the modernisation of agriculture through state-led programmes. Farmers' agency in both seed selection and nurturing diversity in the fields was negated (Bonneuil, 2019, p.10-12), precisely as exemplified in the definition above.

The genetic modernist approach became mainstream, sustaining the technological 'modernisation' of agriculture (which FAO often aligns with, as described for instance in McMichael and Schneider, 2011). It has also chosen its own names for seed, most notably *modern seed*, to indicate that seed is produced with modern technology (see Box 2) and set in opposition to second class *traditional varieties,* viewed as an outdated predecessor. The pride in technological modernisation comes also through in the fact that modern seed has been named synecdochally after the breeding process and its effects: *hybrid seed* or *high-yielding seed*. Most recently the preferred breeding method for the corporate seed industry has been biotechnologies (as indicated on the FAO webpage in Figure 2), also referred to as *advanced* technologies which created *genetically modified seed* or *GMO seed* or, very recently, seed from *New Breeding Techniques (NBTs)* which is currently the object of a battle for discursive legitimacy (Montenegro de Wit, 2021) led by agribusiness and some mainstream national and international institutions, for example the European Commission (as I discuss later) The association of seed with the technology that was used for breeding it, rather than its ecological nature, has created a space for the seed industry to claim rights of ownership, which led to legal and institutional instruments such as intellectual property rights (IPR) under which seed was considered *protected* and patenting in relation to GMOs, which created *patented seed*.

The genetic modernist approach, argue Chable and colleagues, has however led to seed becoming a commodity, as well as to farmers losing skills and to agrobiodiversity declining over time (2020,

p.2), which is why a new conceptualisation of seed is currently being negotiated, in civil society and the biodiversity supporting niche, that opposes the techno-scientific cage imposed on seed in the mainstream discourse. Seed names and the breeding practices that make them are both under scrutiny, one example being the widespread opposition to *GMO seed*, which according to intercultural communication researcher Craig Frayne, originates in "rich symbolic associations between ecology and culture" (2022, p.180). The cultural and ecological connotations of seed are also at the heart of a struggle to re-appropriate seed by its names. In contrast to the definition of seed for its technological associations, the ecological nature of seed is emphasised, for example with regards to *landraces* (locally adapted) and *open pollinated varieties* (the outcome of natural pollination in the field) or seed is referred to with pride by its cultural and historical relevance, as is the case for *traditional* or *heirloom varieties*. Also, in order to highlight that it belongs on farm and within communities, rather than in a laboratory, the names *farm(ers) seed* and *peasant seed* (Demeulenaere, 2014, p. iv) are used. Table 1 below summarises the two main discourses about seed and some of the names for seed used by each of them.

*Table 1 Seed names (material and cultural aspects) in the two main discourses relevant to this document*

| **Driving Characters** | **Discourses about seed** | | | |
|---|---|---|---|---|
| | **Seed as genetic resources** | | **Cultivated diversity** | |
| | **Material aspects** | **Cultural aspects** | **Material aspects** | **Cultural aspects** |
| **Breeding ecology** | | | *Landraces* (adapted to the local environment)<br>*Open-pollinated varieties* (pollinated by wind or pollinators in the field) | |
| **Breeding technology** | *Hybrid seed/F1 hybrids* (bred through hybridisation from pure line parents - see **Error! Reference source not found.**<br>*Genetically modified seed/GMO seed* (through biotechnology) | | | |
| **Historical relations** | | *Modern seed* (bred with modern technology, in opposition to outdated traditional seed, aka primitive cultivars)<br>*Improved varieties* or *quality seed* (by comparison with traditional varieties assumed to be lacking) | | *Traditional varieties* (linked to the culture of the community), *Heirloom varieties* (the prized inheritance of the community) |
| **Ownership** | *Patented seed* (ownership secured through patenting law)<br>*Protected seed* (ownership secured through either IPR or patenting law) | | | *Farm(er) seed* (bred and used on the farm)<br>*Paesants seed* (bred and used within the rural community) |
| **Quality** | *High-yielding seed* (productivity is the desired characteristic, deriving from hybrid vigour - see **Error! Reference source not found.** | | | |

Definitions remain contested in their attempt to capture nuances of meaning, especially in a multilingual context where every language has its own preferences and specificities, as is the case for the EU. There is however a material characteristic that unifies the seeds as conceptualised by those that oppose the genetic modernisation approach, and that is their diversity, born out of its ecological nature: seed belongs on farms, not in laboratories, and farmers and rural communities have the ability to observe and help shape them within their local landscapes. Those material characteristics are captured in the perspective of *cultivated diversity* (see also Box 1) that I adopt.

In the following sections I situate seed diversity, and the practices that make it, within their historical and political context.

## 2.3 THE RISE OF MODERN SEED: BIODIVERSITY DECLINE AND FARMERS' LOSS

Seed saving and reproduction were fundamental to the development of settled agriculture and agricultural communities, as Fakhri, UN Rapporteur for the Right to Food recently pointed out:

> People have had a domestic relationship with plants for approximately 10 thousand years. Through this relationship based on continuous experimentation and adaptation, farmers have co-evolved and adapted genetic resources resulting in increased agricultural biodiversity. Relying on reproductive genetic recombination and mutation for novelty, farmers have driven innovation and agricultural biodiversity by selecting which seeds to save, grow and distribute within and among communities through gifting, exchange or sale. (2022, p. 2)

By comparison, specialised or 'scientific' plant breeding is a relatively new phenomenon, dating back only to the end of the 19th century, when the scientific rediscovery of Mendelian laws of genetic inheritance ended up combining with a colonial premise that saw the earth as a repository of natural resources to be exploited economically (Bonneuil, 2019, p.3-6; Pistorius, 1997, ch. 1), which fuelled the growth of a new seed industry "dominated by an interest in reducing life to something that could be circulated and recombined with predictable efficiency" (Müller-Wille, 2007, p. 805). *Modern seed* was the outcome of this combination of factors.

The trading powers of the time were after the economic advantage to be gained by appropriation of some plants: Bonneuil makes the example of a subspecies of the cinchona tree that had higher quinine content and turned the Dutch, which collected if first, into leaders in production and consequently trade (2019, p. 3). On that assumption, countries had been keen on collecting plant species worldwide. The collection of plants became systematised after the 1920s, after Russian botanist and geneticist Nikolai I. Vavilov developed his theory of climatic analogy and a map of centres of diversity where plants thrived for specific climates, making the world, in Vavilov's own words, a "universal store of genes" (1929, quoted in Bonneuil,2019, p.1).

Economically interesting traits acquired an aura of superiority, and each trait was assumed by Mendelian scientists to be the physical manifestation of individual genes in the genome, so breeding developed in the reductionist direction of selecting for such 'superior' traits and combining the genes assumed to be behind them, as if "self-standing building blocks" (ibid, p. 3), into plants considered superior, at least in terms of their economic value.

Parent plants were selected over generations to become genetically homogeneous (homozygous), as a consequence of which they consistently reproduced the desired physical (phenotypic) characteristics in their offsprings. The practice took the name of pedigree breeding for pure (or elite) lines. As years of inbreeding weakened their vigour, however, pure line parent plants were crossed to produce *hybrid seed* or F1 (filial 1, first generation) hybrids, also known as *modern seed* (see also Box 2). These were considered first-rate farming inputs, as the various epithets (pedigree, pure, elite, modern) indicate. In fact, plants grown from such crosses not only express the desired phenotypic characteristics uniformly in the first generation (and the first only), but they are more robust, thanks to the phenomenon known as heterosis or hybrid vigour, the outcome of restored diversity after generations of inbreeding (Nikles and Griffin, 1992, p.101). Because of that, under the right farming circumstances (established by the breeders on test plots), their yields are higher, which in addition to the selected traits from parents, produced the desired 'quality' of plants.

**Modern or Hybrid seed**

Parent plants are selected over generations to become genetically homogeneous (homozygous) as a consequence of which they consistently reproduce the desired physical (phenotypic) characteristics in their offsprings.

These are called pure line (aka elite line) parents, but inbreeding weakens their vigour. So pure line parent plants are hybridised, to produce hybrid seed or F1 (filial 1, first generation) hybrids, also known as *modern seed*.

Growing this seed produces plants with the desired physical (phenotypic) characteristics of their parents, uniformly, for one generation only.

These first generation plants are also more robust, thanks to phenomenon known as heterosis or hybrid vigour, the outcome of restored diversity after generations of inbreeding (Nikles and Griffin, 1992, p.101).

*Box 2 Modern or hybrid seed*

The Green Revolution and industrialisation of agriculture (see Tansey, 2011 and Van der Ploeg, 2021) aiming to increase food production in the wake of the Wars were predicated on the superiority of high-yielding hybrids, bred by a "formalised research system, divorced from farming" (Tansey, 2011, p.113), the preserve of agronomists on publicly funded research stations and of professional breeders in the developing seed industry. This choice of technology required a dramatic change on farms, as agricultural practices had to align to the needs of the new seeds, as optimal yields would only be forthcoming if the environmental conditions in the fields mirrored those on station, through monoculture and the use of chemical inputs (Van der Ploeg, 2021, p.277).

At the opposite end of the quality spectrum from modern varieties were farmers' or traditional varieties, also known as *primitive cultivars* (Pistorius, 1997, p.22): the seed selected on farms by the farmers themselves and the staple of agriculture since its inception. These were considered an agronomically inefficient production input, yet had a redeeming feature that made them worth conserving for both agronomists and the seed industry: their diversity, the result of adaptation to the varied local circumstances of the farms where they grew. Diversity meant a plethora of potentially useful traits for the breeders to exploit (Bonneuil, 2019, p.11).

Modern varieties, however, their spread backed by national states, were already replacing traditional ones at speed at the beginning of the 20th century. This development worried some geneticists, for example German Erwin Baur, himself a key biologist behind the rise of the genetic resources approach. Even before the World Wars, Baur had started raising concerns about the loss

of diversity in the fields, which might compromise the availability of a valuable source of genes for breeding (Bonneuil, 2019, p.3): the system was not sustainable.

As it established, in the 1950s and 1960s, the seed industry joined national and international institutions (for example the FAO) in a call to increase conservation efforts, be it in wild nature or farmers' fields (Pistorius, 1997, p. 18). The main concern about losing biodiversity remained however anchored into the exploitative attitude that looked at seeds as a treasure trove of genes producing (economically) interesting breeding traits. To protect such valuables, the choice was made to keep them (literally) in banks.

From the perspective of cultivated diversity, gene banks not only froze diversity at a particular point in time and in the limited quantity of seed they could handle, rather than recognising the importance of its continuous development and adaptation on site, but they also set biodiversity apart from the communities where it was needed, as centralisation did not make for easy access (ibid, p.29). Such shortcomings were highlighted by a minority of scientists, who favoured dynamic management of biodiversity in fields and natural reserves – so-called in-situ conservation – to preserve biodiversity in the ecosystem, on account of a less reductionist understanding of genetic inheritance that went by the name *genecology*, which saw plant traits as dependent not on a single, but on a combination of multiple genes and their "dynamic co-evolution in habitats" (ibid, p.36).

These scientists remained a minority within the mainstream discourse and Robin Pistorius, economist and political scientist indicates in his book: *Scientists, plants and politics* (1997) that from the 1980s the genetic resources issue (in relation to cultivated seed) and biodiversity conservation went their own separate ways, as the Consultative Group for International Agricultural Research (CGIAR) network of research centres got financing and power to pursue their Green Revolution principles, after some coexistence with FAO structures. The existence of seed banks continued to be legitimised by the narrative of biodiversity loss propped by the urgency to keep productivity in agriculture (Montenegro de Wit, p. 633-634).

Pistorius attributes the long-term dominance of the single-gene approach to path dependency and "scientific 'inertia'", while ex situ conservation to the incompatibility of monoculture farming practices with in-situ conservation (1997, p. 39-40). I would however argue that the power offered by *first mover advantage* meant that the incumbents would have an interest in discouraging change, given their investment (financial and reputational) in modern seed and the related agricultural practices. In particular, as Pistorius also notes, mainstream applied research supported the single-gene approach because of the convenience and relative effectiveness of its reductionist approach, which gave them authority compared to the uncertainty of even just *proving* a multiple genes theory of inheritance. In agriculture, on the other hand, in-situ conservation would have required different practices giving more power to farmers relative to the seed industry. One can see here how the politics of agribusiness converged with that of agrobiodiversity to the detriment of the agroecological role of farmers, as indicated by Montenegro de Wit (2016, p. 632).

In the next section I follow in the path of authoritative political economists, the likes of Kloppenburg and Howard, in arguing that there is more to the commodification of seed than path dependency from first mover advantage. It has been in the interest of the seed industry to proactively capitalise on modern seed and its new role as a commodity on the market: in order to extend their power, the industry proactively advocated for lock-in mechanisms to increase their power and got them.

### 2.3.1 The technical route to the commodification of seed

Not only, as described in the previous section, did the rise of modern seed cause an ecological rift between farming practices and the biodiverse environment that supports them, by imposing genetically uniform seeds geared for productivity and the standardised practices to grow them, that led to a decline in biodiversity, what McMichael and Schneider call "individualise cropping at the expense of systems of crop diversity" (2011, p.129). The practices of breeding pure line parents and hybrid varieties, their technical details, are at the heart of the commodification of seed breeding that gradually led to "the erosion of farmers' sovereignty over seed" (Kloppenburg, 2014, p.1225).

In fact, pure lines could only be maintained in strictly controlled environments, requiring as they did

> continuous selection in order to clear the strains of variants caused by mutations or accidental cross-fertilisation [...] bureaucratic record keeping and hierarchically organised labour, almost on an industrial scale, with scientific 'managers' at the top, and a basis of unskilled labour," (Müller-Wille, 2007, p. 801; see also Van der Ploeg, 2021, p.277)

which led to another rift. On one side were the farmers' seed systems: the traditional practices in the field (that the genetic resource narrative had labelled 'informal' to highlight a supposed lack of precision in breeding), distributed and therefore biodiverse and a necessary source of genetic resources (Wattnem, 2006, p. 852), giving farmers greater freedom in what they grew and how. On the opposite side, the 'formal' (or commodities) seed system: centralised, genetically more homogeneous, sanctioned by scientific institutions, supported by policy (for example through quality standards) and promoted for political reasons. Seed became the domain of the seed industry, which determined the necessary growing conditions, so farmers had to follow their lead on the ways to manage them and in the process lost skills that had made them self-sufficient and some of their agency in the process (Van der Ploeg, 2021, p.277).

Kloppenburg, whose work is foundational to the debate on the political economy of seed, calls such technical details *the technical path* to the commoditisation of seed (2014, p. 1227): it originated in part from the path-dependency consequences of the choices made in terms of breeding as indicated by Pistorius and discussed in the previous section. However, vested interests of the seed industry played a part in bringing seed – previously a common good – into privatisation, and turning it into a commodity to be bought on the market (ibid, p. 1234). In the words of Kloppenburg:

> For capital, the challenge has been to find ways to separate farmers from the autonomous reproduction of planting material and to bring them into the market for seed every growing season. (ibid, p. 1227)

Howard, an economist studying the centralisation of power in the seed system, concurs:

> The ability of seeds to self-reproduce once posed a formidable barrier to the entrance of large capitalist firms [in the seed market]. (2012, c.7 p. 4)

From being mostly self-sufficient, farmers became just passive end users of seed and other inputs that they had to acquire externally (Rondinella, 2021, p. 7). Institutional acceptance of this change was underpinned on the discursive level by a narrative that saw farmers as "victims of their own poor quality seed" (Amanor, 2010, p.23 quoted in Tansey, 2011, p.111), requiring superior technological innovation delivered to them. In fact, as American sociologist Wattnem points out, the genetic modernist (or high modernist) approach failed "to account for historical and local forms

of knowledge and practices" (2016, p. 854) that had enabled farmers to manage biodiverse seed on farm for centuries. As quality was defined merely by techno-scientific standards, and yields came to be considered the main performance indicator of crops, farmers know-how was negated, a view embraced by FAO, as indicated by the definition of seed I previously quoted.

### 2.3.2 The legislative route to the commodification of seed

Not all crops can be hybridised, so the industry had to come up with other ways of extending their scope and further reducing farmers' self-sufficiency and sovereignty over seed. Kloppenburg calls this path: *the legislative route*, as it makes use of intellectual property rights (IPR) legislation to circumscribe who can use genetic material for breeding and seeds for growing crops (2014, p. 1227).

In the absence of dynamic management on farm, through which seed adapts to the local environment, it is necessary for seed to evolve in other ways to keep up with changing farming and market circumstances - a concept that the FAO above summarises in the phrase *the right seeds.* The seed industry chose for applied research, a costly endeavour as I describe in the next section. To encourage the investment, intellectual property legislation was put in place that offers breeders to all effects "temporary monopoly privileges" (De Schutter, 2009, p.2). Through those privileges, seed becomes private property and farmers no longer have sovereignty on it.

In the European context, a further mechanism of seed enclosure (Wattnem, 2016, p.850) has been quality standards, put in place to address the proliferation of variety names and prevent fraud on the market that would affect food production, considered essential to food security. Legislation was introduced to make sure that only varieties certified as Uniform, Distinct and Stable (DUS), so unequivocally identifiable, could be registered nationally as well as in the EU Common Catalogue and commercialised (Winge, 2015, pp. 3,8). The crops of greatest importance for production were further subject to testing of their *value for cultivation and use* (VCU testing) so that only 'better' plants than the existing ones would be put on the market. Heterogeneous propagation material became no longer acceptable. Besides, such a tightly controlled registration and certification system, with high costs and administration requirements, was more suited to the commodity seed system, and commercialising even those of local and farmer varieties that fit the registration criteria became nigh to impossible (Chables et al, 2020, pp. 2-4, Wattnem, 2016, p. 857; Bocci, 2009, p.31).

The IPR regime has continued to expand over the years, asserting its power internationally, including in the Global South through trade agreements, in particular the 1991 UPOV Convention that strengthened Plant Breeder's Rights with provisions extending "beyond the reproductive or vegetative propagating material to the harvested material" (De Schutter, 2009, p. 6) further restricting farmers' agency and the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreements pertaining to the World Trade Organisation (WTO) that came into effect in 1995 and required the parties to issue regulations with regards to genetic resources. Governments signing trade agreements, out of convenience and pressured by vested interests presenting

> [u]nregulated seeds [...] as 'dangerous', potentially contaminated by some disease, or as a threat to national agricultural health and even food security, (Wattnem, 2016, p. 860)

often adopted the European standards model, even while this model was under scrutiny in Europe.

Further restrictions came in the late 1990s, when in connection to the genetic manipulation of seed, patenting legislation also became relevant to plants and the protection of IPR in agriculture (De Schutter, 2009, p. 5-6; Kloppenburg, 2014, p.1228), despite initial opposition in Europe that

favoured Plant Breeders' Rights (Tansey, 2011, p. 113), which are more permissive of research on the genetic material and the saving of seeds by farmers (Musselli Moretti, 2006, p. 17).

As restrictions continue to expand, it is no longer only farmers whose access to seed is affected. According to Kloppenburg, the legal environment with regards to IPR and patenting is now so complicated to navigate, that in the United States even public breeding has been discouraged, stifling the very innovation that the formal seed system so highly praises. While genetic modification is conducted in partnerships with agrochemical companies (2014, p.1230-1231), "[n]o truly independent research can be legally conducted on many critical questions", according to a group of anonymous scientists (Waltz, 2010, p.996 quoted in Howard, 2021, ch. 7 p. 15).

The power invested in the commodity seed system is a growing concern, as IPR mechanisms have helped to increase concentration in the seed market, something I discuss in the next section.

### 2.3.3 Concentration in the seed market

Up to the 1970s, agricultural research and breeding used to be mainly the domain of public institutions (Musselli Moretti, 2006, p. 15) and smaller seed companies were agricultural in origin (Bonny, 2017, p. 7). In those years, however, under dwindling profits in the market, agrochemical companies started branching out, making acquisitions into the seed business, which had "strong potential for demand complementarity" (Musselli Moretti, 2006, p. 7): seed could be sold together with the inputs to grow it. Bundling of chemical inputs with seed was particularly profitable for commercial and commodity crops, as their purchase was subsidised by governments (Tansey, 2011, p.113), and that became a successful strategy for corporates.

The tendency for concentration both vertically (up and down the supply chain, acquiring for example seed processing and packing facilities) and horizontally (acquiring other seed businesses) continued and consolidated in the following decades with the advent of genetic engineering.

> By the 1990s, there were just 300 firms in the United States that sold commodity seeds, and the number declined to less than 100 by the end of the following decade. [...] Globally, from 1996 to 2011 the top three seed firms more than doubled their market share, and achieved oligopolistic control over more than half of the world market for commercial seed. [...] Between 2015 and 2018, the "Big Six" were reduced to the "Big Four" [...] the top three seed firms are also dominant chemical companies. (Howard, 2021, ch. 7, p.5-6)

In European and Global South countries, especially where marginal environments are prevalent that require smaller quantities of ad-hoc seed and therefore provide little investment attraction to multinationals, public plant breeding is still playing a part (Kloppenburg, 2014, p. 1231; Musselli Moretti, 2006, p.15). Worldwide, however, the seed industry has concentrated in the hands of a few corporations, through international mergers and acquisitions, which Howard documented and are represented in Figure 3 below. The appearance of diversity is maintained with a proliferation of subsidiaries and brands, all answering to the same parent company, but corporations also attempt to exercise power indirectly, without attracting the attention of antitrust authorities and public scrutiny, for example by making alliances and collaborations of various kinds, from joint ventures to seed licensing agreements (Musselli Moretti, 2006, p. 37; Howard, 2021, ch. 1 p. 27 and ch. 7 p. 11; Mammana, 2014, p.8,15).

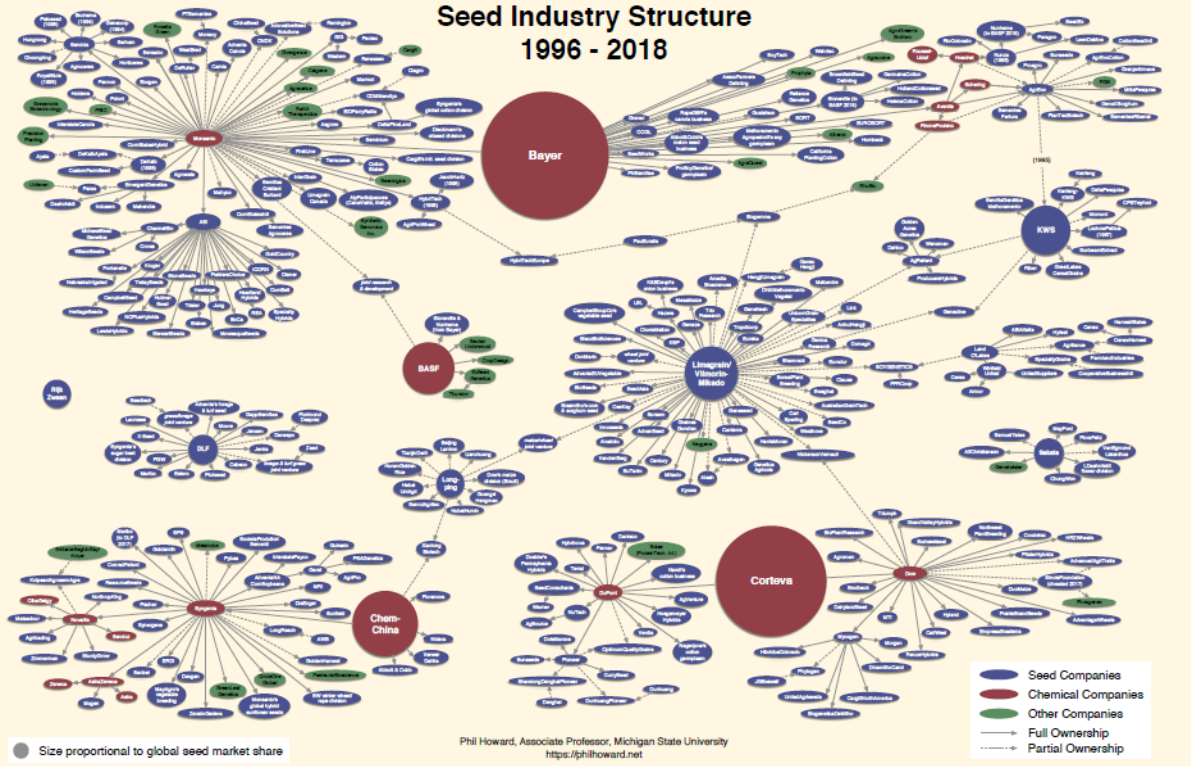



*Figure 3 Consolidation of seed industry (Howard, 2018)*

Research and innovation require considerable investment, particularly as crop breeding takes years before a product can be marketed, so acquisitions are considered a strength because larger companies have greater availability of resources (Mammana, 2014, p.13); consolidating a company's portfolio of patents, with the associated freedom to operate, is also seen as a benefit (Musselli Moretti, 2006, p. 31). However, this leads to a paradox. Stronger competitors on the market means higher barriers to entry for new players (Howard, 2021, ch. 1 p. 6). Once concentration becomes so strong that competition is discouraged, oligopolists acquire unfair advantages, such as more power on influencing prices (both by paying suppliers less and by charging clients more) and fewer incentives to innovate where not profitable (ibid, ch. 1 p.7): what started as the promise of more innovation actually ends up bringing less. Besides, product lines that were profitable for smaller companies often turn out to be less so for corporations and are abandoned, with the result that fewer varieties are available on the market after an acquisition (ibid, ch. 7 p. 11). Farmers end up with fewer choices and increased dependency on a decreasing number of seed suppliers.

Agrochemical companies entering the seed market were from the start familiar with IPR (Tansey, 2011, p.113) and, under their increasing influence, derived from concentration in the market, institutional arrangements continued to be shaped to "promote wide dissemination of broadly adapted varieties" (ibid, p.118) rather than a multiplicity of locally adapted seed. In turn, more favourable IPR regulation made the acquiring of smaller companies and different types of seeds (such as fruit and vegetables, not considered commodities) more attractive for corporates (Howard, 2021, ch. 7 p. 5, 13), favouring their further expansion.

Most recently, the market has been influenced by renewed awareness of the negative effects of chemical inputs, alongside climate change pressures (Bonny, 2017, p.15). In a development that shows how large capital can "adapt to demands for change, and co-opt potential forms of resistance" (Howard, 2021, ch. 1 p.27), the interests of the seed corporations are expanding in the

direction of precision agriculture and related "big data" (ibid, ch. 7 p. 16), touted as the solution to excessive use of inputs, as local information, gathered by machines on the farm, will help machines (and the companies that sell them) help farmers make economic decisions. Such expansion and concentration of information in the hands of the few is however raising concerns about "how this additional power could be misused", both in terms of profiting economically and of further limiting farmers' agency (Khan, 2013 quoted in Howard, 2021, ch. 7 pg. 14).

Niches in the sustainability market that are growing faster (ibid, ch. 7 p. 25; Bonny, 2017, p. 15), such as organic and biological pest control are also targeted for acquisition and co-option. As the seed industry enters new spaces and imposes the most stringent regime standards (Musselli Moretti, 2006, p. 37), however, it increasingly encroaches on those marginal areas where indigenous and peasant production still operate (Howard, 2021, ch. 7 p. 29), that are the only line of resistance against the loss of biodiversity.

Therefore, I agree with Wattnem when she points out that

> [t]he dissolution of so-called 'informal' seed systems [...] is a prerequisite for the growth and consolidation of private seed companies, (2006, p. 852)

and that to contrast it, it is essential to bring more focus on cultivated diversity and the role of farmers and rural communities in addressing the combined challenges of climate change and biodiversity loss. In this context my thesis looks at cultivated diversity as the way towards a more sustainable and just farming system and whether the Farm to Fork and Biodiversity Strategies might support it in the face of industry expansion.

## 2.4 SEEDS OF RESISTANCE

The practice of breeding modern seed and growing them with success in the fields led to uniform, standardised approaches to farming that reduced the freedom of farmers to choose what to grow and how to grow it, creating a rift between agriculture and "its biological foundations", as Schneider and McMichael point out (2010, p.461). Such approaches, propped by legislation that strengthened the power of the commodity seed system, and by narratives of food security and biodiversity loss that legitimised ex situ over in situ conservation, have grown to the detriment of the dynamic management of biodiversity in fields, or cultivated diversity.

Climate change and environmental degradation have brought renewed attention to biodiversity loss. While corporations are trying to exploit any new opportunities deriving from it, resistance is building up by those that advocate the role of agriculture in maintaining diversity in and around the field, bringing together agriculture and biodiversity again in the approaches of agroecology and within it cultivated diversity. In this section I outline how the seeds of resistance were sown. First, I look at how cultivated seed has been brought back into the biodiversity conservation discourse, then I focus on the European Union and how cultivated diversity has been negotiated into policy and legislation there.

### 2.4.1 Biodiversity conservation and farmers' rights

Resistance to the genetic modernism and centralised management of genetic resources started early on. While biologists were struggling to have an impact on the FAO genetic resources'

approach to biodiversity conservation, some progress was made by UN member states in the centres of diversity, mainly located in tropical and subtropical climates and therefore in the South of the world, who challenged the political dimensions of managing resources centrally, and the accruing of benefits derived from their use. First brought up at the 20th FAO conference in 1979,

> [t]he genetic resources issue is primarily about power relationships between countries and institutions with different abilities in respect of having access to and use of genetic resources. (Pistorius, 1997, p.70)

With regards to agrobiodiversity, this meant highlighting the work that farmers had done over millennia to produce and conserve economically useful plants (ibid, p. 79) among which traditional varieties of seed. Increased mobilisation on this topic led first to the International Undertaking on Plant Genetic Resources in 1983, which first recognised the role of farmers in conserving, improving and making available plant genetic resources (Prip & Fauchald, 2016, p. 365). These were defined as the heritage of mankind, "in part an attempt to undo imperial patterns of exploitation" (Fakhri, 2022, p.6) that we saw were inherent in the discourse of genetic modernism. The Undertaking was followed in 1992 by the Convention on Biological Diversity (CBD), making the link between sustainable use of resources, conservation of biodiversity (including through in-situ conservation) and the equitable sharing of benefits (Baker, 2003, p. 26). The Convention was further developed through the Nagoya Protocol in 2010, specifically focussing on Access and Fair and Equitable Sharing of Benefits Arising from the Utilisation of Genetic Resources.

All these institutions were failing to deliver the desired outcome of making genetic resources available for breeding while rewarding those that had developed and maintained them. That was the case particularly with regards to domesticated plants and farmers (ibid, p.7; De Schutter, 2009, p.8). A large part of the debate was on whether genetic resources would be more equitably managed under national property rights or as a global public good: the 2001 FAO International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) chose the latter approach and, importantly, it started a debate on farmers' rights with regards to genetic resources that had wider resonance worldwide (ibid).

### 2.4.2 Cultivated diversity and the European seed legislation

While the debate had been mainly fought around power relationship issues between the North and South of the world, the EU became a party to the Convention for Biological Diversity (CBD) in 1992, although an EU Biodiversity Strategy was not developed until 1998 (Baker, 2003). The EU then joined the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in 2001 that came into force in 2004. Participation in those international institutions created obligations in terms of conservation and sustainable use of agrobiodiversity and farmers' rights to "save, use, exchange and sell farm-saved material", as well as to the protection of traditional knowledge, to equitable recompense for benefits derived from sharing and to participate in decision making (Prip & Fauchald, 2016, pp. 366-367).

The European legislation with regards to seed, as I have described, had developed in the direction of seed enclosure through quality standards, but a centralised structure of control implies a stability which conflicts with the nature of biodiversity: locally adapted and in continuous evolution, and with the rights and needs of farmers that want to preserve it. The biodiversity obligations arising from the international commitments were honoured in the years 2008-2010 through specific

derogations to existing seed legislation, which were however limited to certain crops and posed various restrictions on marketing (ibid, p. 369-370).

The impact of participation in those international institution went further than legislation to inspire European farmers' and civil society who mobilised, leading to the emergence of peasant networks in several countries. These aimed at 'liberating' seed (Bocci and Chable, 2009, p.85). Cultural anthropologist Demeulenaere, in a paper on the emerging farmers' movement in Europe, for example, indicated that the creation of the Réseau Semences Paysannes in France was in relation to "new developments in the anti-genetically modified organism (GMO) struggle and the toughening of seed laws" in the early 2000s (2014, p. ii).

In those years, specifically in 2005, a French seed company took the not-for-profit Association Kokopelli to court for distributing seeds that had not been registered in the national catalogue, a legal requirement in the EU. The case was appealed and debated over 7 years, acquiring a high profile and ending up in the EU Court of Justice. While the status quo of the regulation was upheld and the Association charged, with the blessing of the industry interest group European Seed Association, questions arose in legal circles about the approach and debate about seed ownership and biodiversity swept throughout Europe among seed savers associations (Winge, 2015, ch. 2.3)

In this developing panorama, a range of EU-funded initiatives started exploring how to create and expand the legal space for biodiverse, non-uniform varieties (Bocci et al, 2010, quoted in Winge, 2015, p. 46); these projects provided the opportunity for a range of grassroots initiatives on farmers' rights and seed sovereignty to collaborate with academia, bringing the heterogeneity of the EU farming landscape to attention and, over the years, establishing communities of interest and networks of collaboration (Bocci and Chable, 2009, p.89). Various domains linked to cultivated diversity were explored, as described in Table 2 below.

*Table 2 EU funded projects around cultivated diversity*

| Project | Dates | Aspect of cultivated diversity researched |
|---|---|---|
| Farm Seed Opportunities | 2007-2009 | Inventoried the diversity of breeding initiatives of landraces and local varieties, as evidence for legislation on conservation varieties (Directive 2008/62/EC, Directive 2009/145/EC, Directive 2010/60/EU) |
| SOLIBAM www.solibam.eu | 2010-2014 | Researched strategies for organic and low-input integrated breeding and management, aimed at better performance, sustainability and stability of crops |
| CERERE www.cerere2020.eu | 2015-2018 | Multi-actor project to identify and promote existing agroecological innovation with regards to cereal crops |
| DIVERSIFOOD www.diversifood.eu | 2015-2019 | Multi-actor project to embed diversity in food value chains |
| Dynaversity www.dynaversity.eu | 2017-2021 | The combined sequel of projects Diversifood and Cerere analysed on-farm dynamic management in all its dimensions |
| LiveSeed www.liveseed.eu | 2017-2021 | Multi-actor project to breed biodiverse seed for organic and low-input agriculture in view of the lifting derogation regulation (EC 1452/2003) |

The legal space where non-uniform varieties would best fit turned out to be the regulation on organic, and in particular EU regulation 2018/848 on organic production and labelling of organic products, known as the 'new organic regulation' which recently replaced the regulations 834/2007

and 889/2008 mentioned above. In Europe organic is likely the best proxy to sustainable agriculture (as described by Frison in IPES-Food, 2011, p. 14), and the new regulation indicates why:

> Organic production is an overall system of farm management and food production that combines best environmental and climate action practices, a high level of biodiversity, the preservation of natural resources and the application of high animal welfare standards and high production standards in line with the demand of a growing number of consumers for products produced using natural substances and processes. Organic production thus plays a dual societal role, where, on the one hand, it provides for a specific market responding to consumer demand for organic products and, on the other hand, it delivers publicly available goods that contribute to the protection of the environment and animal welfare, as well as to rural development. (European Parliament, 2018)

While the organic market has been steadily growing, however, the seed industry has been unable to provide the required amount of certified organic seed, so a derogation was in place (Commission Regulation EC 1452/2003) to allow farmers the use of conventional seed that was not treated with pesticides, known as *untreated seed*. The latest EU funded project of the series, LIVESEED (see Table 2) focussed specifically on how to build capacity in the organic seed market and breed plants more suitable for the needs of biodiversity-supporting farmers, by involving farmers in Participatory Plant Breeding (PPB) and dynamic on-farm management. The projects advocacy, in the wake of its predecessors, resulted for in the permission to market heterogeneous propagation material (OHM, non-DUS material) also known as biodiverse seed for the first time through Delegated Regulation (EU) 2021/1189, providing organic farmers better access to locally adapted and adaptable genetic material and opening the way for the return of farmers to breeding activities.

It is in this changing regulatory context that my thesis looks at the EU Farm to Fork and Biodiversity Strategies and their possible role in furthering change, and in particular bringing together agriculture and biodiversity conservation in the unified approach of cultivated diversity.

The Farm to Fork Strategy, in fact, besides a commitment to expanding the organically farmed area to 25% of the total by 2030, explicitly mentions "seed security and diversity" as one of the elements of sustainable food production and takes pride of improvements in the seed legislation (European Commission, 2020a, p. 10) even though seed are discussed mainly in the Biodiversity Strategy.

# 3 A FRAMEWORK FOR READING THE FARM TO FORK STRATEGY

In this chapter I introduce the theoretical framework I adopt to analyse the Farm to Fork Strategy as both instrument and driver of change. The Multi-Level Perspective (MLP) of Socio-Technical Transitions, and in particular the structuralist MLP approach to the management of sustainability transitions, offers an established model to analyse change at the system level, formalised as a transformation from one way of organising society in all its multiple dimensions, to another: a transition. As the term transition has become common parlance and it was adopted by the Strategy itself, I found the MLP a suitable framework to look critically at the Strategy's claims about change.

To begin with, then, I situate the Farm to Fork Strategy as a policy artifact in the historical transition that, in addressing the shortcomings of the Green Revolution and industrialisation of agriculture, has taken us to the contemporary focus on 'sustainable agriculture'. In particular I look at the Strategy from the perspective of cultivated diversity, as a step in the ongoing historical transition process away from productivist agriculture and in the direction of more sustainable food systems, linked to a greater awareness of the impact of agriculture on biodiversity and the climate.

As the Farm to Fork Strategy itself adopts the language of transitions, claiming to be a facilitator of sustainability in food systems, I compare the role it fulfils with the one it purports to, confident that analysing the text from a critical perspective, together with the narratives it mobilises and the practices it implies, will help shed light on the direction the transition may take, and the Strategy's likelihood of bringing about sustainable agriculture that is biodiversity-supporting.

## 3.1 HISTORICAL TRANSITIONS AND THE MULTI-LEVEL PERSPECTIVE (MLP)

> Transition is the process or a period of changing from one state or condition to another
>
> Oxford Learners' Dictionary[5]

Transitions have been studied as a historical phenomenon of change over time in a number of social sciences. One middle range theory has emerged over time, from the innovation as well as Science and Technology Studies (STS), which can be used as a heuristic tool to study the phenomenon in its broader significance: the Multi-Level Perspective of Socio-Technical Transitions (MLP). One of the main proponents of this theory is Frank Geels (Geels, 2010, p. 495; Darnhofer, 2015, p.18), but the perspective has been adopted by a range of authors, as I outline below.

The MLP assumes that "basic societal functions" (Gaitán-Cremaschi et al, 2019, p.4) are broadly stable "semi-coherent rule-sets" or *regimes*. From within the structuration tradition of the social sciences, Darnhofer (2015) views regimes as complex co-evolving aggregations of

- Structures: "the formal, physical, legal and economic aspects that enable or restrict practices"),
- Cultures: "the cognitive, discursive and ideological aspects involved in sense-making") and

[5] https://www.oxfordlearnersdictionaries.com

- Practices: "the routines, habits and procedures through which actors (individuals, organizations) maintain the functioning of the societal system"

that are relatively stable over time thanks to path-dependency and lock-in mechanisms (ibid, pp.18-19). Duru et al, also within the tradition, define regimes as

> relatively stable configurations of institutions, techniques and artefacts, as well as regulations, standards and norms of production, practices and actor networks [that have the] ability to create technological, organisational and institutional lock-ins" to ensure their own persistence. (2015, p.1244)

Because a regime holds a dominant position and reproduces dominant structures, it is "by definition - associated with 'power', 'dominance' and 'vested interests'" (Avelino & Wittmayer, 2016, p. 631) and as such it resists radical innovation that might challenge its power and stability (Gaitán-Cremaschi et al, 2019, p. 4). Despite being applicable at various levels, Geels observes that regimes are often taken as "shorthand for 'system'" in empirical studies (2011, p.31), and that certainly applies to the study of sustainability transitions in food systems.

Because the regime is resistant to change, radical innovation, that is "new technologies, new concepts, and new ways of organisation and of doing things" (ibid), originates according to the MLP in *niches*: "formal and informal networks of actors" on the margins of the regime (Duru et al, 2015, p.1244) that "provide the seed for systemic change" (Geels, 2011, p. 27). These niches are either market niches or other protected environments (such as funded research or demonstrations) where innovation can develop and prove its worth in relative safety (Darnhofer, 2015, p. 19).

> Niches gain momentum if expectations become more precise and more broadly accepted, if the alignment of various learning processes results in a stable configuration ('dominant design'), and if networks become larger (especially the participation of powerful actors may convey legitimacy and resources to niche-innovations). (Geels, 2011, p.28)

The processes through which niches may acquire more clout have been described by Elzen and colleagues as *anchoring* processes, and these as having three dimensions: *technological*, as the specifications of the innovation become more established; *network*, as champions and stakeholders extend their support, and finally *institutional*, when new ways of thinking and rules and regulations pertaining to the innovation are defined (2012, p. 6). Such Institutional anchoring to the regime can be further detailed as *economic*, *normative* and *interpretative*, the latter related to sense-making and worldview changes (ibid, pp. 5-6; Schiller et al, 2020, p. 614). I will frequently return on these mechanisms, which I listed in Table 3 below.

*Table 3 Niche anchoring mechanisms (Elzen et al, 2012)*

<table>
<tr><th colspan="5">Niche anchoring mechanisms</th></tr>
<tr><td rowspan="2">Technological<br>the specifications of the innovation become more established</td><td rowspan="2">Network<br>as champions and stakeholders extend their support</td><td colspan="3">Institutional<br>when new ways of thinking and rules and regulations pertaining to the innovation are defined</td></tr>
<tr><td>Normative</td><td>Economic</td><td>Interpretative<br>related to sense-making and worldview changes</td></tr>
</table>

Some authors have postulated a stage in which niches, in the process of anchoring, may cluster together in their expansion, gaining strength and forming so-called niches-regimes (Avelino and Rotmans, 2009, p.545), but regardless of this happening, at some point during its establishment innovation must come into contact and interact with the regime. Interactions with the regime may be sought after by the niche or be prompted and accelerated by changes both within the regime itself (i.e.when weaknesses become apparent over time or internal conflicts emerge) and by interactions of different regimes that create openings for change (Darnhofer, 2015, p.20).

However, change can also originate in the wider *landscape*: the "global context" (Duru et al, 2015, p. 1244), a heuristic layer of analysis external to the system under study and more stable over time. Changes in the global context can put pressure on the regime and create windows of opportunities for change (Geels and Schot, 2007, p. 401) as well as the reverse: stifle change that was underway.

In the words of Avelino and Rotmans, societies are complex adaptive systems and *transitions* are "non-linear processes of social change in which a societal system is structurally transformed" over time and through variable phases from "one dynamic state of equilibrium to another" (2009, pp. 543-544). MLP theorists Geels and Schot define transitions as "changes from one sociotechnical regime to another" and understand transitions as "outcomes of alignments between developments at multiple levels" (2007, p. 399). Their graphical illustration of a transition is reproduced in Figure 4.

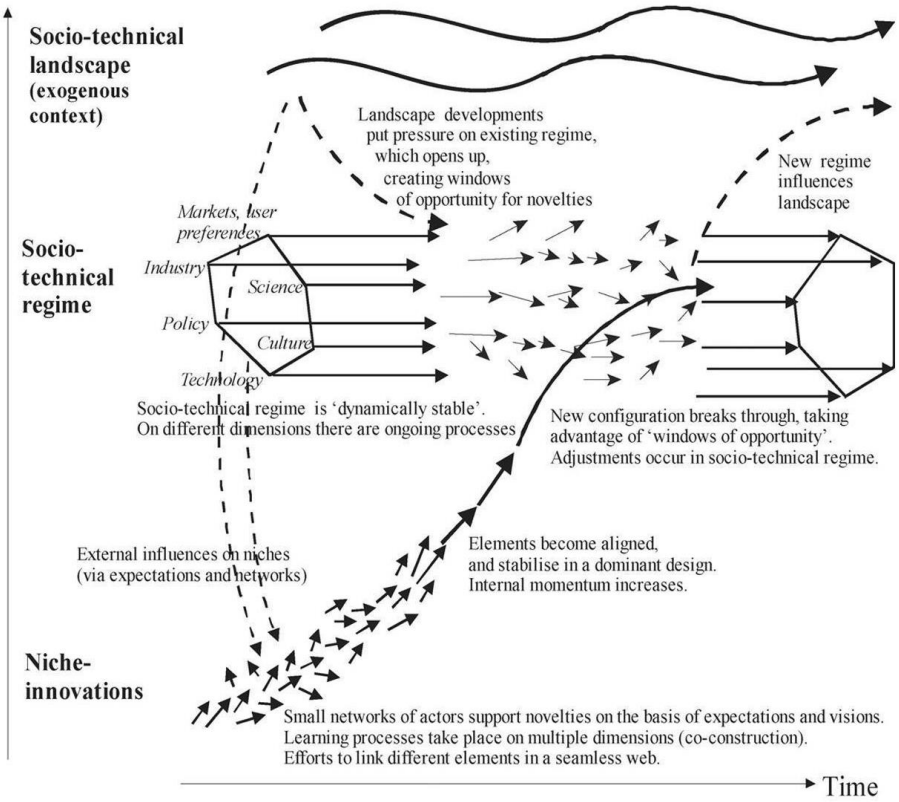



*Figure 4 Transitions according to the MLP (ibid, p. 401)*

### 3.1.1 Thwarted transitions: when the layers do not align in support of change

"Transitions do not come about easily", says Darnhofer (2015, p.20): as the inherent stability mechanisms of a regime, including path-dependency, lock-in and the exercise of power, are in the way of radical change. There are several reasons why a transition may never happen. In some cases,

it may be that niches themselves may never grow to challenge the regime, either because they remain too small to be a threat or because the niche actors have no perception of the need to challenge or no incentives to do so (Isgren and Ness, 2017, p. 14; de Molina, 2013, p.46). In other cases, niches will grow but may anchor to the regime through conforming to its principles or practices, so they become non-threatening (Isgren and Ness, 2017, p. 8), what Smith and Raven quite aptly define "fit and conform" (2012, p.1030 quoted in Hinrichs, 2014, p. 149). The "boundaries between the dominant food systems and the niche food systems are blurry and permeable" remark Gaitán-Cremaschi and colleagues (2018, p. 6) and niches may adapt to coexist with the regime.

However, niches may adopt a "stretch and transform" approach (Hinrichs, 2014, p.149 quoting Smith and Raven, 2012), and if they become a threat for the incumbent regime, the regime will respond by trying to oppose change or incorporate the innovation in order to preserve stability. Anderson and colleagues have detailed some of the governance dynamics through which this is performed. On the one hand, the regime can aim to strengthen its power. They can do that by *suppressing* the niche, that is actively repressing and even criminalising it (an example of which could be that described by Montenegro de Wit: vested interests around trade agreements spreading fear about farmers' seed systems as if they were a threat to national farming objectives), or *co-opting* its practices, that is supporting them only to the extent that they conform to its norms and values. On the other hand, if it cannot oppose the niche effectively, the regime can at least try to maintain its power by *containing* the niche and keeping it marginal and *shielding* it, keeping it separate, which may enable it to develop unhindered in the initial stages (the very definition of a niche in fact), but, as the niche matures, can turn into a trap to its transformative potential (2021, pp.154, 165). The regime dynamics of resistance to change are summarised in Table 4 below.

*Table 4 Regime dynamics of resistance to change (Anderson et al, 2021)*

| **Regime dynamics of resistance to change** | | | |
|---|---|---|---|
| Strengthening power | | Maintaining power | |
| Suppressing | Co-opting | Containing | Shielding |

Geels and Schot have postulated that change may take a range of evolutionary pathways, following a challenge by the niche, depending on the regime's reactions, the wider landscape circumstances, as well as the anchoring strategies taken by the niches themselves and their supporters. These pathways range from simple trajectory adjustments and technological substitution, to the actual re-configuration of the regime following "erosion and collapse": a transition proper (2007, p. 414).

## 3.2 TRANSITION MANAGEMENT AND SUSTAINABILITY TRANSITIONS

In response to contemporary environmental challenges, MLP has also emerged as a heuristic framework for analysing current (as opposed to historical) societal changes, with a focus on sustainability transitions. This branch of the social sciences is preoccupied with the management of transitions in-the-making. In fact, contrary to historical transitions (defined as *emergent*) sustainability transitions are ongoing and *purposive,* that is they have normative directionality, aiming as they are at steering change in the direction of the public good that is sustainability (Geels, 2010, p. 508; Geels, 2011, p. 24; Darnhofer, 2015, pp.17-18; Hinrichs, 2014, pp. 144-145).

*Sustainability* is however "an ambiguous and contested concept" (Geels, 2011, p. 25), so Hinrichs (2015) highlights that analysis should focus on its definition, its dimensions (whether environmental, social etc) and the values and priorities that they privilege:

> it is important to ask why a particular socio-technical configuration in a given place at a certain time should be understood as a thorough, meaningful transition to "sustainability". (ibid, p.151)

In fact, the sociologist indicates, because of the contextual nature of sustainability, we should be speaking in the plural and talk about "*transitions to sustainability*" (ibid, p.153 italic in the original).

As sustainability is a public good, transition management "is a *policy*-oriented framework" (Köler et al, 2019, p.5), which reflects on the *governance* of transitions and its co-evolving multi-dimensional, multi-actor processes, looking at the role of institutions and their interactions with other stakeholders in shaping policies and facilitating networks, but also at how niches can be managed to achieve sustainability goals and how the reaction dynamics of the regime can be addressed.

The inherent political nature of change in transitions implies power struggles, as change creates winners and losers and vested interests in the regime will oppose it (ibid, p.6). Geels observes in particular that systems in need of sustainability transitions are characterised by a dominance of corporations, whose reach gives them a strong advantage compared to niche players (Geels, 2011, p.25). *Power* therefore is another focus area of sustainability transitions, and in particular where power resides during the transition, how it is performed, who is included and excluded, how the transition is legitimised (Hinrichs, 2014, p. 151). Avelino and Rotmans, whose research focuses on power in transition, argue that power vacuums are in fact the very source of a transition: as systemic power is lost by the regime during a phase of instability, niches "may be better able to respond [...] by mobilizing new resources that the regime may have no access to." (2009, p. 560)

Another domain of importance in transition management for sustainability is the role of *discourse* (Geels, 2011, p.30) to win legitimacy and mobilise public support in a particular direction: "social movements, industry associations, policy makers and other special-interest groups struggle to shape discourses to their advantage", so they frame issues and negotiate legitimacy and influence, often linking to broader narratives that originate at the landscape level (Geels, 2010, pp.505-508).

## 3.3 FOOD SYSTEMS TRANSITIONS: THE EU

Among the sustainability transitions that have been studied through the MLP and related theories, and that look at the system level, are those related to food and agriculture.

The mainstream ways we produce, distribute and consume food (the food system) are under strong landscape pressures, what Hinrichs describes as: "[a] confluence of intensifying circumstances in the early twenty first century" that sees climate change impact on agriculture on multiple levels from crop yields to biosecurity threats, extreme weather events and microclimates out of kilter, while at the same time regime agriculture - with its productivist approach - creates a "non-trivial contribution to climate changing emissions" (2014, p. 144). Fossil fuels and other mineral resources (i.e. phosphorus) which sustain our input-intensive and mechanised farming systems (IPES-Food, 2016, p.8) are dwindling and further exploration is encroaching on rural land, while at the same time some alternative fuels compete with food crops for land (Marsden, 2013, p. 126). "There's increasing global fiscal instability, rising social inequality" (Hinrichs, 2014, p. 144) and "a growing interest in the

commodity markets in food futures", which risks further increasing food insecurity (Marsden, 2011, p. 126). Biodiversity is declining at an alarming rate, and some of the ways we are trying to protect it (i.e. land sparing, emissions offsetting) without shifting our fundamental perspective to embrace ecological values (defined by Schneider and McMichael define *market environmentalism*, 2010, p. 481) lead to land concentration and grabbing that affects rural and indigenous communities' ability to feed themselves (see IPES-Food, 2016, p.26; Nally, 2015; Anderson et al, 2021, p.159). Soils have degraded to such an extent that even 'dirt' has been making the headlines, and land use change is reducing availability of agricultural land even further (i.e. SAPEA, 2020, p.44).

Landscape pressures have brought internal weaknesses in the regime food systems to the surface, which affect its resilience in the face of external disturbance: reliance on dwindling external inputs, an expectation of cheap food as a commodity, which generates social and nutritional as well as environmental impacts (Duncan et al, 2020, p.2), concentration in the industry and power imbalances across the supply chain that deny sustainable livelihoods to the most vulnerable actors, such as farm and food processing factory workers, and centralised supply chains that are so lean they cannot adapt to any unexpected disturbance, such as the SARS-CoV-2 pandemic has demonstrated. This "food system failure" (Hinrichs, 2014, p. 144) prompted widespread calls for change, supported by a large body of scientific literature (Gaitán-Cremaschi et al, 2018, p.1). An alternative perspective, espoused by McMichael, is that the global food system is not broken:

> It is working precisely as a capitalist food system is supposed to work: it expands constantly, concentrating wealth in a few, powerful monopolies, while transferring all the social and environmental costs onto society. (Holt-Giménez, 2019 quoted by McMichael, 2021, p.53)

Even if based on different premises, both perspectives assert that the agricultural regime is unsustainable, leading a range of actors in academia to advocate in support of change. Even in the context of the EU, scientific advice with regards to food systems has increasingly taken the point of view that a transition is necessary from the current unsustainable system, an example being the SAPEA consortium Evidence Review Report (from now on referred to as SAPEA Report) that provided advice to the European Commission about "A sustainable food system for the European Union" (2020). This fed into the Scientific Opinion "Towards a Sustainable Food System" (European Commission, 2020d), supposed to inform the Farm to Fork Strategy as part of the EU better policy-making framework (Scientific Advice Mechanism – SAM)[6].

Among the number of niches in Europe, two in particular have emerged to challenge the regime: o*rganic agriculture* (also called *biological*) and *agroecology*, both of which originated as science-based critiques of productivist farming methods (the former with a particular focus on soil health and fertility). Both turned into social movements in the face of wider concerns (the latter also becoming known as *political agroecology* see Anderson et al, 2021, p.131), when the negative effects of intensive agriculture gained visibility around the 1980s (Vogt, 2007, p.1; Pimbert, 2015, pp.287-288). Both niches favour social over technological innovation, typical of industrialised, productivist agriculture, and focus instead on the practices that define human interactions with the environment, and are better suited to underpin a transition to biodiversity supporting agriculture (Schneider and McMichael, 2010; Hinrichs, 2014, p.147; Darnhofer 2015, p.23).

[6] The Scientific Advice Mechanism to inform policymaking https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/scientific-support-eu-policies/group-chief-scientific-advisors_en

These niches have gone through different stages of anchoring over time, and their challenge to the regime has been resisted in a number of ways, as I briefly describe below.

### 3.3.1 The niche of organic agriculture

The organic niche is notable in Europe because it has gone through a process of institutional anchoring (normative and economic) in the 1990s, when organic regulation on quality standards for the marketing of seed was introduced (Darnhofer et al, 2010, p.332; Darnhofer, 2015, p. 20). Organic has also gone through considerable technological anchoring, not only as its characteristics have been formalised in quality standards and other institutional documents such as the FAO/WHO Codex Alimentarius[7] but as the movement itself, which since the 1970s has formed the International Federation of Organic Agriculture Movements (IFOAM), has formalised the *principles of organic agriculture*[8] (Darnhofer, 2011, p.339) and adopted a definition of *organic agriculture*[9] in 2008.

However, organic has not been widely embraced from a discursive point of view, in what Elzen and colleagues call *interpretative* dimension (see Table 3). The regime has succeeded in constructing a subordinate role for organic on the discursive level, what Anderson and colleagues refer to as *containing* and *shielding* (see Table 4) and what Marsden calls "constructed marginalisation" (2013, p.124), resulting in narratives dismissing organic as unable to compete with productivist farming or lacking scientific legitimacy, an example of the latter being the 'muck and magic' narrative that developed in the UK (Smith, 2007, p. 440). The existence of an organic label has also been turned discursively against the movement having been called an elite lifestyle product. In this way, organic has been forced into a politically toothless role on the side of the regime, what Day and Schneider have described as "focus on niche marketing to the urban middle class, without seeking to transform rural social relations" (2017, p.1223 quoted in Anderson et al, 2021, p. 95).

On the level of practices, the challenge presented to the productivist regime has led to a range of reactions in the form of appropriation or co-option, carried out in different ways. One of those is the process of conventionalisation: some certified businesses follow the letter of the law rather than the organic principles (i.e. substitute chemical inputs with 'organic' inputs in an otherwise productivist context, as noted by Isgren and Ness, 2017, p.3), whose extent has been however questioned by Darnhofer and colleagues (2010). Other actors adopted "organisational forms that are isomorphic" to the regime, such as the organic product lines offered by multinational companies that still operate within an industrialised farming framework (Duncan and Pascucci, 2017, p.333). Both these forms of co-option have fed into the discursive objections to organic.

### 3.3.2 The niche of agroecology

Agroecology, has followed a different path. Its perceived ability to address the shortcomings of organic made it quickly rise to fame in Europe in the last two decades. In terms of scientific backing, agroecology has a strong academic background (the name agroecology itself is squarely situated in the natural - agricultural and biological – sciences, as geoecologist Wezel and colleagues describe in their classic paper (2009). Agroecology has not been formalised into standards and labelling, which

[7] Codex Alimentarius Commission: Organically produced foods (Third Edition) available online at https://www.fao.org/3/a1385e/a1385e00.pdf
[8] IFOAM https://www.ifoam.bio/why-organic/shaping-agriculture/four-principles-organic
[9] IFOAM General Assembly Definition of Organic Agriculture https://www.ifoam.bio/why-organic/organic-landmarks/definition-organic

makes it less suspect for those that see quality labels as a neoliberal market instrument rather that an instrument of resistance to it, even as they claim to represent moral values, for example Guthman (2007). As labels also come with barriers to entry (i.e.certification costs for farmers) and a price premium for consumers, agroecology rather than organic (mostly identified as a food label) has been associated with social justice. Because agroecology was embraced by academia and international institutions alike, including the UN and the EU (Pimbert, 2015, p.286) it has swiftly gone through network and institutional interpretative anchoring, giving it discursive legitimacy, so much so that "agroecological transition" is a shorthand for sustainability transition in agriculture.

However, similarly to other recently emerged niches (i.e.regenerative agriculture), "the lack of a precise definition of agroecological movements or practices" (Wezel et al, 2009, p. 9) leaves it open to interpretation by different players, which is arguably one of the reasons why agroecology has unified a diversity of actors, as Anderson and colleagues indicate (2021, p. 130). The malleable boundaries of the concept give the regime extensive opportunities to appropriate the language of agroecology "in a way that simplifies its complexity and emphasizes characteristics that align with a specific agenda" (ibid). Wezel and colleagues go as far as saying that "everyone could claim that his or her own movement could be called agroecology" (2009, p.9). The discursive success of

> agroecology gets "co-opted" by the depoliticized and technocratic discourse of "sustainable intensification" and subsumed under the corporate-led push for a "New Green Revolution" (Isgren and Ness, 2017, p.4)

that according to political agroecologist de Molina

> promotes technological solutions rather than institutional or social change. (2013, p.46)

Like organic, agroecology is undermined in its productive capacity (Levidow et al, 2014 quoted in Duncan and Pascucci, 2017, pp. 316-317), for example in the way research funds are allocated (Isgren and Ness, 2017, p.2; Kremen, 2015, p.18; Anderson et al, 2021, p.161).

### 3.3.3 Regime reactions: sustainable intensification

The sustainable intensification discourse Isgren and Ness mention is predicated on the assumption that the world's population is growing, more food is needed and because of environmental concerns we must (to use the regime trope) *produce more with less*: utilising fewer inputs and non-renewable resources, wasting less. The narrative derives its ecological legitimacy from an assumption that more efficient intensive agriculture will produce enough food while freeing up land where nature can be protected (separately from human activities, so-called *land sparing* paradigm, see Box 3 below). In doing so, it "downplays the huge potential of diversified agroecological systems to regenerate existing farmland and sequester carbon" (IPES-Food, 2016, p.55). This more 'efficient' intensive agriculture fails to be transformative as the principles of regime production:

- off-the shelf technologies, including inputs, supporting specialisation of production
- standardisation replacing place-based knowledge, products and practices

remain unchallenged (Marsden, 2013, p.214) and with them the power relationships that they subtend (Anderson et al, 2021, p.161). Duru and colleagues refer to it as "efficiency/subsititution based agriculture" (2015, p.1238), in that it relies on technological innovation and substitutes to reduce its negative effects. In order to boost its sustainable credential, it may even adopt practices co-opted from agroecology that "can be narrowed and diluted to a more reductionist approach"

**Sustainable intensification and the land sparing/land sharing debate**

The land-sparing argument goes back to Norman Borlaug, the architect of the Green Revoloution [...] The land-sparing strategy advocates segregating nature conservation from agriculture, using intensive, high-yielding agricultural production in one portion of the landscape to meet food demands, thereby freeing up lands for nature conservation elsewhere. The land-sharing strategy advocates accomplishing both biodiversity conservation and agriculture in the same landscape. Wildlife-friendly forms of agriculture would use organic and/or agroecological farming methods that promote on-farm biodiversity, and/or incorporate more small patches of natural habitat within the farming landscape.

Kremen, 2015, p.2

*Box 3 Sustainable intensification and the land sparing/land sharing debate (Kremen, 2015)*

(Marsden, 2013, p.215) in place of previously used ones. As increased efficiency is often gained through smart or digital technology, this approach has also been termed "climate smart agriculture" or "precision agriculture" (Gaitán-Cremaschi et al, 2019 p.3).

Professor of agroecology Stephen R. Gliessman proposed a scale to grade the evolutionary pathways towards an agroecological transition, adopted by Chable et al of project DIVERSIFOOD and reproduced in Box 4 below. In the scale, the bottom two levels are business as usual trajectory adjustments, and precision agriculture figures no higher than level one, being defined as:

> increased efficiency of industrial and conventional practices in order to reduce the use and consumption of costly, scarce, or environmentally damaging inputs. (2016, p. 187)

**Evolutionary pathways towards an agroecological transition**

Level 5: Build a new global food system based on equity, participation, democracy, and justice, that is not only sustainable but helps restore and protects earth's life support systems upon which we all depend
Level 4: Re-establish a more direct connection between those who grow food and those who consume it
Level 3: Redesign the agroecosystem so that it functions on the basis of a new set of ecological processes
Level 2: Substitute alternative practices for industrial/convential inputs and practices
Level 1: Increased efficiency of industrial and conventional practices

adapted from Gliessman, 2016

*Box 4 Evolutionary pathways towards an agroecological transition (Gliessman, 2016)*

#### *3.3.3.1 The food security narrative behind sustainable intensification*

The sustainable intensification discourse is the environmentally conscious evolution of a *food security* narrative (sometimes also referred in the context of international development as the need to *feed the world*) of Malthusian origin, which pustulates that population growth will outstrip food production, so more food needs to be produced to ensure everyone is fed.

In neo-Malthusian fashion, state sociologist Lajoie-O'Malley and colleagues, the food security narrative views technological innovation as the solution to food insecurity on account of increased productivity. Technological progress is endowed with "social, political, and even moral" qualities (2020, p.9), making social reform redundant while legitimising regime institutions, which can thus hold on to their power (ibid): an attractive option. Despite food security being a distributional issue, linked to poverty and access to food rather than to food availability (ibid; Frison, 2020, p.74) the

technological optimism of the food security framing has underpinned the regime food approach to food production since the Green Revolution. Over time, nutritional concerns have been co-opted into the narrative with the adoption of food technologies such as "supplementation, fortification and biofortification, with little emphasis on durably improving people's access to a diverse diet" (IPES Food, 2016, p.55) and social concerns by "integrating smallholders into agribusiness-led global supply chains as outgrowers" with no consideration for power imbalances (ibid).

The food security framing can be used to manipulate the public in favour of regime institutions, as it adopts a narrative of scarcity that fuels fear, which is associated with materialistic and self-interest attitudes, says US activist and writer Moore Lappé (2013, p. 11). Besides, she notes, attention to the root causes of food problems (why questions) is diverted by a focus on quantifying scarcity (ibid, p. 9). So-called *yield gap* calculations embody an urgency that can be turned into a justification to suspend all concerns to concentrate on producing more and save lives, thus paving the way for technological innovation arguments in place of social reform for justice, confirms Nally, in a study on how the narrative also underpins geopolitics of land grabbing (2015, p.12).

#### *3.3.3.2 Small-scale farming, the market and sustainability transitions*

The sustainable intensification narrative espoused by regime actors is associated with a neoliberal view of the market as an almost sacred institution and of agribusiness, the embodiment of agricultural improvement, as superior to small-scale farming. The latter may well need social support and solicitude, but does not constitute 'real' business: small scale farmers are not considered able fully to participate like other market actors, observes Nally (2015, pp. 16-17). Small and peasant agriculture is represented in the mainstream neoliberal position of regime institutions, including the FAO, as "essentially a 'poverty baseline'", argue McMichael and Schneider in their review of the food crisis of the late 2000s (2011, p.125), and more of the same technologically 'modernised' agriculture is the default regime response to crises in agriculture, as "commercial farming in general is the appropriate strategy to increase productivity" (ibid). That also implies that small-scale farming and its possible role in the sustainability of food systems are thought unrealistic and often ridiculed (Nally, 2015, pp.13-15; Anderson et al, 2021, p. 149): I described how organic farming in the UK was associated with the phrase 'muck and magic'.

### 3.3.4 A biodiversity-supporting niche-regime

A number of niches have now emerged to address the unsustainability of food systems through social innovation, while organic and agroecology have actually posed a challenge to the regime, at least on the discursive level, if having made limited progress in practice. In Europe, these niches have started to coalesce in a niche-regime, for example when the organic movements federation IFOAM EU issued a position paper on agroecology in 2019 highlighting the synergies between the two movements (IFOAM EU, 2019). Organic and a range of Alternative Food Networks (AFNs) (Duncan and Pascucci, 2017) applying agroecological and regenerative practices, are connecting together, for example - as I described - creating coalitions around EU funded projects about cultivated diversity, which resulted in the EC Let's Liberate Diversity network. Analogous cooperation is taking place around EU projects dealing with innovation in shorter supply chains and urban food supplies, as described by Maye and Duncan (2017, p. 2). Local alternatives and social innovations therefore, can be said to be gaining ground in practice too, even if on the discursive level they have to contend with sustainable intensification narratives.

While the regime more generally may still be offering support to sustainable intensification research and efforts, "cities and regions are emerging as major actors in such innovations, and new alliances are being formed between public entities, local entrepreneurs, and civil society groups" (2019, p. 7) pursuing a range of transitional paths, states De Schutter, lead author of the IPES-Food report calling for a common food policy in the EU. Are these the beginnings of a transition?

## 3.4 SITUATING THE FARM TO FORK IN THE EU FOOD SYSTEMS TRANSITION

The EU Farm to Fork Strategy is one of the streams that make up the European Green Deal, the 2019-2024 European Commission plan to address climate-related challenges and make the European Union carbon neutral by 2050. The Strategy is an agenda-setting exercise that for the first time in the history of the EU attempts to deal with the whole value chain of food from production to consumption (Schebesta and Candel, 2020, p. 586) and that can be considered among "the world's most ambitious efforts to catalyse a food system transition" (Candel, 2022, p.296). Other streams of the Green Deal that are directly connected with food and agriculture are the Biodiversity Strategy, focussing on conservation of biodiversity both wild and agricultural, and the sustainability reform of the Common Agricultural Policy (CAP), a longstanding policy whose main focus is on food security and farmers' economic sustainability (Moran, 2021).

I am looking at the EU Farm to Fork Strategy as a step in the ongoing transition process away from productivist agriculture and in the direction of more sustainable food systems, that was described above, and I am approaching it from the perspective of cultivated diversity. Cultivated diversity can be defined as a niche within the niche-regime that aims to achieve sustainability through biodiversity-supporting agriculture (what Duru et al, 2015 also call "biodiversity-based").

From this analytical perspective, the EU Farm to Fork Strategy, as a document, lies on the policy axis of the socio-technical regime, as described by Geels and Schot (2007): it's a document issued by a regime institution, the European Union (see Figure 5 below). However, this document is an attempt to provide policy in response to changes in the wider landscape: namely climate change and biodiversity decline, coupled with the persisting social injustice in and around the food chain. The SARS-CoV-19 pandemic, which reached Europe just before the launch of the Strategy, brought to light further fragilities in the food systems: disrupted supply chains, food waste and food shortages, as well as precarious working conditions, fragilities that are discussed in detail by Bisoffi and colleagues (2021) and that the Strategy also refers to.

The Farm to Fork and Biodiversity Strategies (which are to be read in synergy) may be seen as the way the regime, under pressure from the landscape (in MLP terms) is responding to interactions with the niche-regime, which is garnering popular support (i.e. European Commission, 2020a, p.4; European Commission, 2020c, p.12). Given the circumstances, as warned by Anderson and colleagues, the documents might be mobilising dynamics that either strengthen or at least maintain power for the regime. However, the Strategies also follow in the wake of years of advocacy, not least by the EU funded projects working on disruptive innovations in biodiversity-supporting farming and supply chains. Such advocacy already led, in May 2021, to an institutional (normative and economic, see Table 3) anchoring step for cultivated diversity in the form of Commission Delegated Regulation (EU) 2021/1189 supplementing the new Organic Regulation (EU) 2018/848, which recognises the production and marketing of organic heterogeneous material, albeit with limits. That was also a technological anchoring step: heterogeneous propagation material relies on

a different approach to plant selection and breeding, which values the adaptive capacity of seed and the role of farmers in managing it, thus requiring their active participation in innovation through Participatory Plant Breeding (PPB), practices which have now gained some regime legitimacy.

Overall, the consideration for agrobiodiversity in the EU policy arena may be at unprecedented levels (as stated by DG AGRI senior specialist Annette Schneegans at the launch of EU project Dynaversity in 2021) and the Farm to Fork Strategy could well represent a breakthrough in the EU food regime, eventually leading to deep structural change under the right circumstances. It could otherwise just promote a (more or less contested) trajectory adjustment within the existing regime.

What makes the Farm to Fork Strategy particularly interesting in this context is that the document itself adopts the language of transitions (a word that appears over 30 times in 23 pages), claiming to offer a window of opportunity for change and ascribing to itself a role in it:

> The Farm to Fork Strategy is a new comprehensive approach to how Europeans value food sustainability [...] This Strategy aims to reward those farmers, fishers and other operators in the food chain who have already undergone the transition to sustainable practices, enable the transition for others, and create additional opportunities for their businesses. (European Commission, 2020a, pp. 4-5)

In Figure 5 below I drew the Strategy as a window of opportunity for change within regime policy.

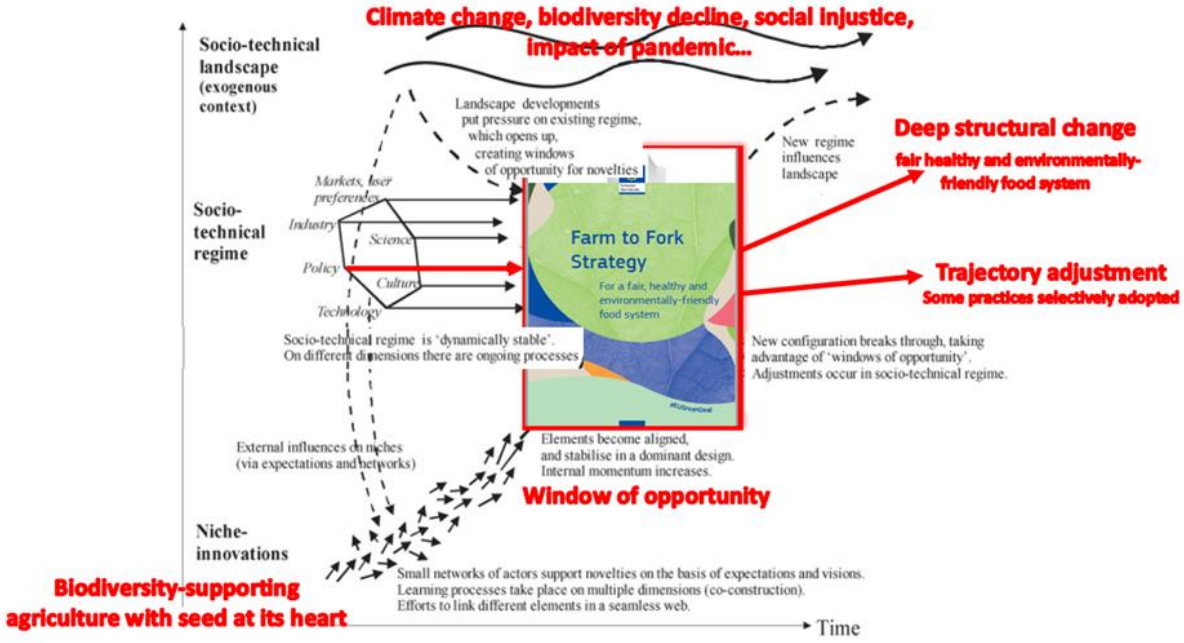



*Figure 5 Range of transition pathways from the point of view of cultivated diversity (adapted from Geels and Schot, 2007)*

We could take the word of the Farm to Fork Strategy to signify that this document aims to provide what Elzen and colleagues define *a hybrid forum*: an overlapping area between niche and regime, which could favour the further establishment of the niche (2012, p. 15) However, what does the Farm to Fork Strategy mean by sustainability transition exactly? The document claims to be intervening in an ongoing process and steering it forward, but where to and how? What does "sustainability" mean for the European Commission? What are its dimensions?

I set out to answer those question with a Critical Discourse Analysis exercise.

# 4 METHODOLOGY: CDA OF A POLICY DOCUMENT

I have already described, with regards to sustainability transitions, how one would approach them by expanding on the meanings of sustainability and its various dimensions, then looking at power relationships within policy and governance, and finally analysing the use of discourse to the purpose of winning ground and legitimacy for the forces at play. In this chapter I outline how, starting from the discourse in the document, I go through those three steps.

In order to understand the Farm to Fork Strategy as a policy artefact, reflecting the social construction of problems, I approach the text with the aim of understanding the implicit and explicit representations of concepts, problems, solutions and the relationships of power that they imply. That is to say, I take an interpretive approach to policy analysis (Browne, 2019).

I look at the Farm to Fork Strategy as a text that draws from – at the same time as it impacts on and reproduces – societal structures, institutions and power relationships through its use of discourse. Figure 6 below is an attempt I made at representation of the embeddedness of the text in the policy and further the wider social context. It is inspired by van Dijk's metaphor:

> Discourses are like icebergs of which only some specific forms of (contextually relevant) knowledge are expressed, but of which a vast part of presupposed knowledge is part of the shared sociocultural common ground, (2001, p. 114)

and Fairclough's three-dimensional conception of discourse as the sum of text, discursive practice (production, distribution, interpretation) and social context (1992), as described by Huckin:

> The meaning of a text derives not just from the words-on-the-page but also from how those words are used in a particular social context. When more than one user and one social context are involved, a given text will typically have more than one "meaning". (1997, p. 80)

Critical Discourse Analysis, as I interpret the descriptions about, is going through the layers and making connections between words and meanings that may lie beyond it.

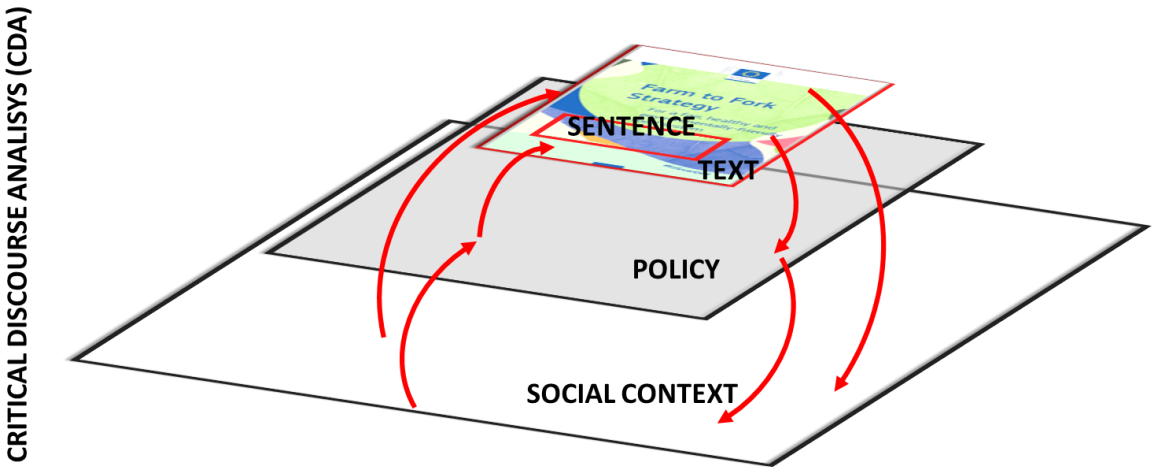



*Figure 6 Dimensions of the policy text EU Farm to Fork Strategy*

My focus is on the use of language and narratives, which are rooted in frames and imaginings, what Van Dijk calls social representations "that reflect the basic aims, interests and values of groups"

(1993, p. 258). Lajoie-O'Malley and colleagues, in their analysis of policy documents discussing the sustainability transition of food systems, reinforce the point that frames and imaginings play an important performative role in policy, in that they set the context and are "key drivers of directionality" for socio-technical transitions (2020, p.2).

To read the text, I combined two models. First, to look at the problematisation of the sustainability transition, I loosely adopt a tool ideated by Carol Bacchi: What is the Problem Represented to Be? or WPR (2012, p.21), a set of six questions to guide the critical analysis of a policy text in search of a problem definition and the power structures that it subtends:

- What's the problem represented to be
- What assumptions underpin the representation
- How did such representation come about
- What is left unproblematic
- What effects are produced by this representation
- How is this representation reproduced and how it is contested.

I have already discussed in other sections how, whenever there is ambiguity in a concept, the language may be co-opted by the regime, in a depoliticized non-threatening way; in such a situation, practices are adopted selectively, to pursue trajectory adjustment: projecting the appearance of change while remaining anchored to established principles. This means avoidance of a re-configuration of the system with the related change in power balance that it entails.

It is therefore important in the management (in socio-technical discourse) or governance (in policy discourse) of transitions that language does not get captured but keeps conveying meaning for change, and that practices are not grabbed out of the context of the ethic that generated them. Therefore, I deem it essential to complement the problematisation by uncovering what practices are advocated or implied by the Farm to Fork Strategy, and what likelihood they have to support change in the direction of just, sustainable food systems. Within the literature, Schneider and McMichael highlight how this is particularly important for agriculture:

> abstracting from practice enables a theoretical orientation to agricultural systems that privileges their capitalist aspects to the detriment of understanding their ecological aspects. (2010, p.472)

It is in the detail of the practices that one can tell if biodiversity if supported or the reverse, as different practices have different outcomes in the physical realm of the agroecological environment, and only some of those support biodiversity.

Alongside the WPR tool, which offered analytical questions to guide me through the text, I adopted the Critical Discourse Analysis (CDA) framework laid out by Huckin for insights on where to look for answers to those questions:

- the text as an artefact in its entirety through such things as:
  *Layout and position of photographs, diagrams and other graphics*;
  *Foregrounding*: use of headings and keywords to emphasise certain concepts;
  *Suppression*: what is conspicuous for its absence;
  *Presupposition*: using words or narratives that take certain ideas for granted;
  *Register*: implying that certain points of view are more legitimate, reliable or significant.

- at the sentence level:
  *Topicalization*: repeated use of words or expressions to skew a reader's interpretation;
  *Agency*: who is represented as powerful, over whom and who as powerless or passive;
  *Nominalization*: converting verbs into nouns or using passive structure to shift responsibility;
  *Insinuations*, suggestive ambiguous language that leaves the way open for denial;
- at the words and phrases level:
  *Connotations*: culturally relevant metaphors or figures of speech conveying strong meaning;
  *Labelling*;
  *Modality*: conveying degrees of certainty and authority through use of particular words;
  *Register*: wording or use of a different person that may induce mistrust or scepticism

(1997, pp. 80-84; McGregor, 2003).

## 4.1 CHOICE OF TEXT

The Farm to Fork Strategy comes in two different formats: one is the official *communication* from the European Commission and comes in the format of EU legal documents. The other one is indicated on the website as *publication*[10], even though the title of the file is Action Plan. In the latter document, the text of the official communication is formatted with appealing font and graphics for wider consumption. I analysed this second version (European Commission, 2020a, which I will refer to henceforward as F2F) on the assumption that presentation in a document, including the use of images, also provides clues to the underlying discourses, as indicated by Huckin.

In particular considering that I approached this task from the perspective of cultivated diversity, it was necessary to read the Farm to Fork Strategy in concert with the Biodiversity Strategy 2030, which complements it, and in particular chapters 2.2.2 on restoring biodiversity on agricultural land, 2.2.3 on soils and 2.2.4 on forests. The Biodiversity Strategy also comes in two formats, but the text is not identical, so I used the official communication from the commission for my analysis (European Commission, 2020b, which I will refer to henceforward as BS).

## 4.2 THE ITERATIVE PROCESS OF APPLYING THE FRAMEWORK

The broad objective of Critical Discourse Analysis is to

> systematically explore often opaque relationships between discursive practices, texts, and events and wider social and cultural structures, relations, and processes. (McGregor, 2003)

Applied to a document, it

> tries to point out those features of a text that are most interesting from a critical perspective, those that appear to be textual manipulations serving non-democratic purposes. (Huckin, 1998, p.80)

Describing how to operationalise a Critical Discourse Analysis (CDA), Meyer writes: "data collection is not considered to be a specific phase that must be completed before analysis begins" as CDA is a

[10] Both formats are available at https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

hermeneutic process within which "one part can only be understood in the context of the whole", which implies "continuous feedback between analysis and data collection" (2001, p. 16, 23).

Based on such premises, and guided by my combined framework of WPR and CDA, I read the text with both an inductive and a deductive approach, letting meaning emerge while also looking out for issues highlighted in the related literature and policy papers.

This meant repeatedly reading the Farm to Fork Strategy, while in between researching words and concepts that emerged in academic and policy literature, then approaching the text with the newly acquired knowledge in search of new insights. This process I went through six times.

My first reading relied on the knowledge I had acquired in my internship and preparatory research. I set about highlighting words and phrases that supported, opposed or were indifferent to the success of an agroecological transition from the point of view of cultivated diversity. This challenged me to define my cultivated diversity perspective more clearly, narrowing my focus down for the next reading of the text, and resulting in the chapter on cultivated diversity (Chapter 2).

In the second round I looked more closely at the problematisation, in the third at the following:

- the objectives of the Strategy, as stated;
- anything pertaining to the concept of sustainability;
- anything pertaining to the concept of transition;
- stakeholders and agency, with a particular focus on farmers.

As I was not satisfied of my understanding, my fourth reading was again about the problematisation and the role of farmers, while in my fifth I concentrated on the problematisation, having decided to code the text with the words:

- problem (a statement about some issue with the food system),
- cause (a definition of a root cause for the problem),
- solution (a suggestion on what to do),
- goal (a general sustainability objective of the Strategy),

to try and clarify how the Strategy described a goal or a proposed solution and how that goal or proposed solution was connected with either a problem or its root cause.

After that, I went back to a clean copy of the strategy which I searched, ad hoc, for specific words of interest, for example 'biodiversity', 'emissions', 'standards', 'food system' versus 'food systems' etc and with regards to specific concepts that emerged from a comparison with the Biodiversity Strategy (i.e. 'agroecology', 'cooperation' or 'collaboration'), all of which I discussed in my analysis.

With regards to the literature review, I followed an argumentative approach, selectively examining material pertaining to a cultivated diversity perspective, starting from what I had gathered during my course, internship and preparation work, complemented by suggestions I received from colleagues and researchers, some of which I found through Research Gate (https://www.researchgate.net/). I looked at online material published by institutions I was acquainted with and from there I proceeded researching on both Google (for grey literature) and Google Scholar (for academic literature) for content of relevance to transitions, agroecology, seed and biodiversity, the EU legislation and related policies (i.e. the Green Deal), as well as related issues such as narratives and concepts mentioned by the Farm to Fork Strategy. I took the lead from the bibliography of the papers I found most interesting to search further in a snowball fashion.

## 4.3 POSITIONALITY, LIMITATIONS AND REFLECTIONS

Given the historical and political complexities that surround the creation of a policy text, and the multidisciplinarity required to understand its implications, it would be difficult for me correctly to interpret all the nuances and implications of the text, especially as I have not followed the whole process over time. In addition to gaps in the background, the time and scope constraints of a thesis project also limited the extent and depth to which I could conduct my research. Besides, limited my analysis to written material, from which only partial insights can be derived, as so much is unspoken in policy and lobbying circles.

"Strict 'objectivity' cannot be achieved by means of" Critical Discourse Analysis, states Meyer (2001, p.30), as the researcher performing a CDA identifies as an advocate in a socially relevant cause, and they themselves choose their preferred methods to perform a CDA The argumentative approach I adopted reflects my belief and support for the cultivated diversity perspective of agroecological farming and my desire that it become the outcome of the transition.

I come to cultivated diversity from a background in organic, as hobbyist first, then a professional horticulturist. I developed a more convivial vision of farming through my association with the Oxford Real Farming Conference (https://orfc.org.uk/) and my aversion for the reductionism behind genetic modification was strengthened when I was a member of the board for GM Freeze (www.gmfreeze.org/). However, my knowledge of the EU policy context is limited to occasional participation in events in the last three years and the internship with Rete Semi Rurali, which was the inspiration for this thesis by focussing my attention on seed diversity.

Because of my background, and following Holmes' categorisation (2020, p. 6), I can position myself somewhere between insider and outsider in this debate. As an insider, I may be subject to confirmation bias and/or fail to articulate or explain obvious information; on the other hand, I have easier access to other practitioners and share their concerns so that I can thoroughly advocate for them. At the same time, being an outsider – at the very least with regards to the more political context – I acknowledge my naivete in interpretation, but hope I may identify some blind spots or provide new interpretations that might help with furthering advocacy for a cause I have at heart.

While reflecting on my work and my approach to it, I want to remark something that has particularly affected me personally throughout, and that is the concept of standards. I first studied Wattnem's paper *Seed laws, certification and standardization* (2016) for one of my last MSc exams, and I found the author's claims that standards embed the moral values of their creators and exercise anonymous power challenging to accept. After all, I have found standards useful in my personal daily life: as a consumer of organic products, for example, I find them an essential baseline for my decisions, and as a knowledge manager at work, I have always found standards for sharing information convenient to define and apply.

However, the Wattnem paper turned into an extremely useful tool to analyse the Farm to Fork Strategy with an interpretive lens and drew my attention to the insistence of the Strategy on standards. When looking at standards from the perspective of cultivated diversity, with its focus on locally appropriate seeds and practices, I started understanding their limitations and their political nature. Such insights are still fresh in my mind, but something I will keep reflecting on in the future.

# 5 FARM TO FORK STRATEGY: A CRITICAL DISCOURSE ANALYSIS

In this chapter I report the findings of my reading of the Farm to Fork Strategy, within the MPL framework and through a Critical Discourse Analysis of the text and the narratives it draws from.

My first step is looking at the concept of sustainability in the Strategy in order to understand what sustainability means for the Commission and what its dimensions might be. Following Carol Bacchi's lead, and her theory that power relationships are expressed in the way in which a problem is defined and implicit in the kind of solutions proposed to tackle it, I then look at the Strategy's claims about a transition towards sustainability. Throughout the exercise, I ask what problem(s) the Farm to Fork is trying to solve and what trajectory the transition is envisaged to follow. As practices are an differentiating factor towards a cultivated diversity outcome, I spend some time looking into the practices discussed or implied by the Strategy. Because the Farm to Fork Strategy is to be read in conjunction with the Biodiversity Strategy, I proceed to compare and contrast how both sustainability and the aims of the transition are elaborated in the two texts. To conclude, I link the Strategy back to the wider policy context of biodiversity concerns and agroecological transitions discussed in the previous two chapters in order to project it in the future, and I analyse how the food security discourse has been mobilised by political forces around the adoption of the Farm to Fork Strategy.

## 5.1 SUSTAINABILITY IN THE FARM TO FORK STRATEGY

The Farm to Fork Strategy has been praised as a first effort to take a longer term, food systems approach rather than looking at food and agriculture through policy silos and within political terms (Alberdi et al, 2020). Together with the Biodiversity Strategy it has also been listed among "some of the world's most ambitious efforts to catalyse a food system transition" (Candel, 2022, p.296), with ambitious targets (Mowlds, 2020, p. 20). However, it was also criticised for claiming to intervene in the transition to sustainable food systems without providing a clear definition of how sustainability in food systems is envisioned (Schebesta and Candel, 2020, p. 586; Duncan et al, 2020, p. 3). Definitions, principles and requirements about the sustainability framework, in fact, will not be published until the end of 2023 (F2F, p. 8) and even the European Parliament in their Initiative Report in response to the Farm to Fork Strategy

> calls on the Commission to promote a societal dialogue on a common understanding of sustainability and its various components, on the path towards its proposal for a legislative framework for a sustainable food system (2021, p. 13).

There is no acknowledgement of the fact that sustainability is a contested concept and that different stakeholders might have different interpretations of it, which instead is also one of the key messages of the SAPEA Report (2020, p.86). On the contrary, sustainability seems to mean positive outcomes for all: primary producers and businesses, citizens and workers alike, and in all domains: environmental, social and health and economic. For example, the Strategy states

> A shift to a sustainable food system can bring environmental, health and social benefits, offer economic gains and ensure that the recovery from the [COVID-19 related] crisis puts us onto a sustainable path, (F2F, p.4)

a statement that lacks nuance and ignores the inevitable trade-offs in political choices. When analysed, the statement reveals that the Strategy adopts the common view in both corporate sustainability and sustainable development discourses, referred to as the *three-pillar paradigm*: a depoliticised approach that presents economic, social and environmental goals as "seemingly equally desirable" (Purvis et al, 2019, p. 685), rather than competing realities, and achievable by an apparently effortless "balancing of trade-offs" (ibid). The optimism in the paradigm comes from the equally popular *win-win* trope which, according to sustainability researcher Purvis and colleagues reflects a bias of "consensus building" by presenting all goals in the three-pillars "as benign necessity" (ibid, p. 692). The chosen approach of the Strategy ignores the contextual nature of sustainability and drastically limits one's "ambition to fundamentally change core business practices for the sake of sustainable development" say business researchers Hahn and colleagues (2010, p. 219). In fact, while win-win situations "may exist under certain conditions" (ibid), acting only on the minimum common denominators between social, economic and environmental priorities is far from enough to achieve the transformational change needed for sustainability.

More than that, the approach obfuscates the purely economic concerns that lie behind it. According to Purvis and colleague in the context of sustainable development it was born out of "a quest to reconcile economic growth as a solution to social and ecological problems on the part of the United Nations" (2019, p. 681); equally, in the corporate context, state Hahn and colleagues:

> [a]ccording to the win-win paradigm environmental and social issues are only taken into account to the degree that they contribute to enhanced corporate economic performance. (ibid, p.218)

This particular choice of the Strategy lies opposite to what Hinrichs suggests would be a critical approach to the concept of sustainability in agriculture: asking

> whether or not (and how) it justifies and incorporates other than environmental criteria, and what range of values and priorities it captures and privileges. (2014, p.151)

While it is in line with the incremental improvements that belong with sustainable intensification (see also Box 3), the three pillars paradigm is in obvious contrast with the Strategy's claims to be enabling a sustainability transition. In fact, the definition of transition is that of a fundamental shift away from the principles, practices and governance that keep the mainstream socio-technical system in place. Compromising in favour of economic growth is in the way of achieving a transition. Considering McMichael's observation that current, unsustainable food systems are working precisely as they are meant to in the paradigm they were created, all the more then a totally different paradigm from economic growth needs to be defined to support sustainable food systems and guide a transition. As Duncan and colleagues point out transformation "implies a change of mental models, social practices and even the development of new values" (2022, p.183).

Transition is however another taken for granted concept in the Strategy, with little indication of what is supposed to change, namely the problem the Strategy sets out to solve in order to lead the EU food systems to sustainability. In the next section I will address this issue of problematisation.

## 5.2 WHAT IS THE PROBLEM REPRESENTED TO BE?

The Strategy describes principally its own goals, in terms of the expected outcomes it desires to achieve through its interventions, and offers plenty of solutions to achieve them, often at the level

of individual practices, in what appears more of a tactical than a strategic approach. Consistently with a tactical approach, very few problems are described, and even fewer root causes are identified. In Table 5 below I gather together all the problems described in the chapters of the Strategy with regards to the food supply chain, and what appear to be the proposed solutions. I will return on some of those when discussing the Strategy's plan for sustainable food production.

*Table 5 Problems described by the Farm to Fork Strategy with regards to the food supply chain*

| Item | Problem | Cause | Solution | Page |
|---|---|---|---|---|
| 1 | EU agriculture is the only major system in the world that reduced GHG emissions (by 20% since 1990). However, even within the EU, this path has been neither linear nor homogeneous across Member States | | There is an urgent need to reduce dependency on pesiticides and antimicrobials, reduce excess fertilisation, increase organic farming, improve animal welfare, and reverse biodiversity loss | 5 |
| 2 | the manufacturing, processing, retailing, packaging and transportation of food make a major contribution to air, soil and water pollution and GHG emissions, and has a profound impact on biodiversity | | The Commission will come forward [...] with a 2030 climate target plan | 5 |
| 3 | in the EU, 33 million people cannot afford a quality meal every second day | | | 5 |
| 4 | the 'food environment' does not ensure that the healthy option is always the easiest one | | | 5 |
| 5 | over half of the population are now overweight, contributing to a high prevalence of diet-related diseases [...] and related healthcare costs. Overall, European diets are not in line with national dietary recommendations | | [...] so it is essential to take action to change consumption patterns and curb food waste | 5 |
| 6 | The use of chemical pesticides in agriculture contributes to soil, water and air pollution, biodiversity loss and can harm non-target plants, insects, birds, mammals and amphibians | use (by farmers) | The commission will take additional action to reduce the overall use and risk of chemical pestices by 50% and the use of more hazardous pesticides by 50% by 2030 | 9 |
| 7 | The excess of nutrients (especially nitrogen and phosphorus) in the environment, stemming from excess use and the fact that not all nutrients used in agriculture are effectively absorbed by plants, is another major source of air, soil and water pollution and climate impacts. It has reduced biodiversity in rivers, lakes, wetlands and seas. | excess use (by farmers), absorption by plants | The Commission will act to reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility. This will reduce the use of fertilisers by at least 20% by 2030. | 9 |
| 8 | Agriculture is responsible for 10.3% of the EU's GHG emissions and nearly 70% of those come from the animal sector. They consist of non-CO2 GHG (methane and nitrous oxide). In addition, 68% of the total agricultural land is used for animal production. | Agriculture (generic), animals, farmers | the Commission will facilitate the placing on the market of sustainable and innovative feed additives. It will examine EU rules to reduce the dependency on critical feed materials [...] by fostering EU-grown plant proteins as well as alternative feed materials [...] | 10 |
| 9 | Antimicrobial resistance (AMR) linked to the excessive and inappropriate use of antimicrobials in animal and human healthcare leads to an estimated 33,000 human deaths in the EU/EEA every year, and considerable healthcare costs. | excessive and inappropriate use (by farmers) | The Commission will therefore take action to reduce overall EU sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030. | 10 |
| 10 | Climate change brings new threats to plant health. | | The Commission will adopt rules to reinforce vigilance on plant imports and surveillance of bio-based products. New innovative techniques, including biotechnology and the development of bio-based products, may play a role in increasing sustainability [...] | 10 |
| 11 | Climate change and biodiversity loss constitute imminent and lasting threats to food security and livelihoods. | | In the context of this strategy, the Commission will continue closely monitoring food security, as well as competitiveness of farmers and food operators. | 12 |
| 12 | Food processors, food service operators and retailers shape the market and influence consumers' dietary choices through the types and nutritional composition of the food they produce, their choice of suppliers, production methods and packaging, transport, merchandising and marketing practices. As the biggest global food importer and exporter, the EU food and drink industry also affects the environmental and social footprint of global trade | (neutral statement, not a problem) | the Commission will develop an EU Code of conduct for responsible business and marketing practice accompanied with a monitoring framework. The Code will be developed with all relevant stakeholders. The Commission will seek commitments from food companies and organisations to take concrete actions on health and sustainability | 13 |

As the root causes for problems are not identified, it is unlikely any proposed solutions will address them. Noting this shortcoming, Alberdi and colleagues write that "the F2F Strategy does not address the causes of our current challenges in sustainable and structural ways" as it fails to recognise that the problems it highlights in its text are "essentially linked to the industrial food system" (2020). I agree that the Strategy appears only to address some of the symptoms which, in the specific case of farming, are some of the best-known damaging practices in productivist agriculture (i.e. use of pesticides and synthetic fertilisers) for which the Farm to Fork sets reduction targets to limit their negative impacts. Reduction targets are however no transformational path, but

only an input reduction/substitution trajectory adjustment of sustainable intensification, described by Gliessman at the bottom of a transition scale (2016, p.187 see also Box 4).

In the following sections I go into more detail about some of the assumptions and representations emerging from the text that support this conclusion. Following the guidance of Bacchi's WPR questions, I also reflect on the effects of such representations and how they are reproduced and contested, as well as highlighting what is suppressed in the discussion. In doing so I focus on power relationships, governance and the narratives mobilised in support of the Strategy's objectives.

I start by highlighting how, following a common pattern of discursively transforming crises and challenges into opportunities (see for example McMichael and Schneider, 2011, p.120) the Farm to Fork turns the unsustainability of the current system from a problem into an opportunity, and the sustainability transition into a competition for economic success. Then I consider the role of farmers in such a competition, and how the Strategy adopts an agricultural modernisation outlook that looks down on farmers as failed businessmen, unable to join in the market. That leads me into considering how the technological modernisation approach of Farm to Fork deals with farming practices, including those related to seed. While suggestions had been made that the European Commission adopted a multi-level democratic approach to governance (Alberdi et al, 2020; SAPEA, 2020) the Farm to Fork takes up the role of market facilitator, adopting governance by standards, whose pitfalls I then consider with reference to the contextual, local needs of cultivated diversity.

### 5.2.1 A competition for economic success

The Strategy is framed as a competition for economic success while striving to minimise climate-impacting GHG emissions, which is also noted in the critique by social policy researcher Mowlds:

> The F2F strategy proposes solutions focussed on reducing carbon emissions and increasing yields, rather than systemic alternatives that encompass broader goals such as ecosystem health. (2020, p.23)

Biodiversity, although mentioned more often than emissions in the text (19 to 12 times in fact), is clearly not well integrated in the approach as tackling that particular problem is left to the Biodiversity Strategy, something that I discussed later.

The competition narrative emerges from the fact that sustainability and sustainable food systems are referred to as *challenges*, offering plenty of *opportunities* of success for those who take them:

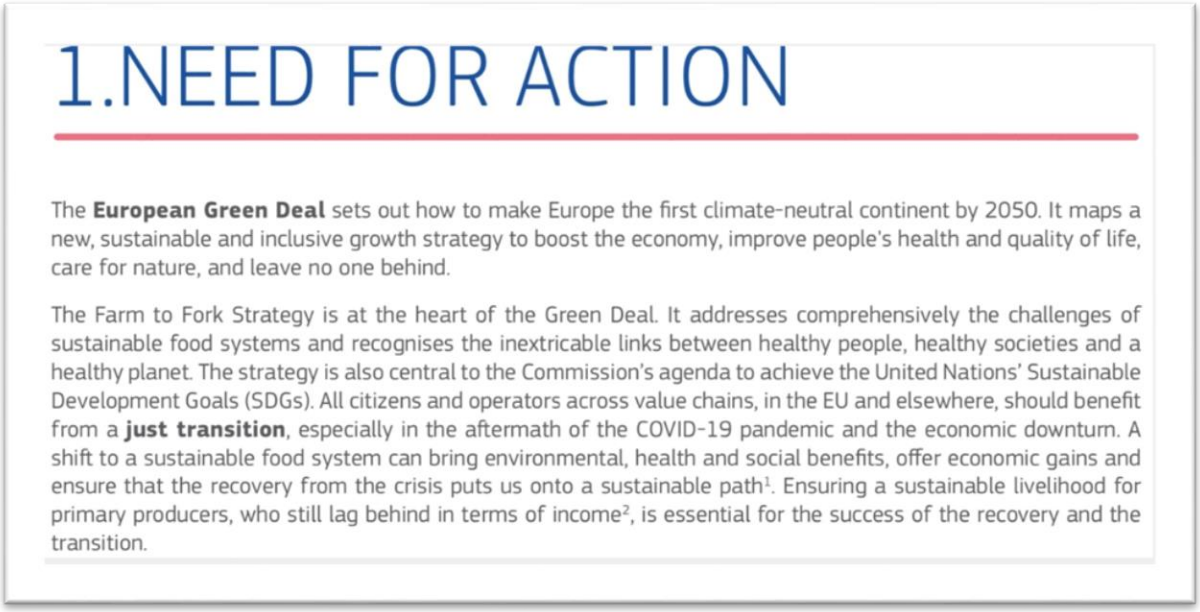
> all actors in the food chain should see this as their responsibility and opportunity (F2F, p.4)
>
> [t]he transition to sustainable food systems is also a **huge economic opportunity** […] this is an opportunity for farmers [… t]he transition to sustainability presents a 'first mover' opportunity for all actors in the EU food chain (F2F, p. 5, bold in the original)
>
> farmers should grasp opportunities. (F2F, p.9)

The graphic illustration that accompanies the paragraphs about the Strategy's goals, lists *new opportunities* as one of the four main goals as shown in Figure 7 below.


*Figure 7 Farm to Fork Strategy: illustration of goals (F2F, p. 7)*

Describing crises as opportunities is not an uncommon device: McMichael and Schneider discuss how that same device was used with reference to the food crisis of 2007-08 by both regime and agroecological niches: in particular, the crisis in question was the opportunity for the agroecology niche to gain mainstream attention through the IAASTD report, which recommended "democratically grounded" solutions, "attentive to cultural diversity and biodiversity" (2011, p.135). The Farm to Fork Strategy is published at a similar point in history, when the SARS-CoV-19 pandemic has once again exposed the weaknesses in regime food systems. Once again, to borrow the title of the IAASTD report, agriculture is at a crossroads. Once again, as was previously the case, the choice is made for an agriculture that is "a servant of economic growth" (ibid, p.119). In fact, the text of the Strategy states it loud and clear in the opening lines (reproduced in Figure 8):

> The Farm to Fork Strategy is at the heart of the Green Deal [which is defined as] a new, sustainable and inclusive growth strategy to boost the economy, improve people's health and quality of life, care for nature, and leave no one behind [while making Europe] the first climate-neutral continent by 2050. (F2F, p.4)



# 1.NEED FOR ACTION

The **European Green Deal** sets out how to make Europe the first climate-neutral continent by 2050. It maps a new, sustainable and inclusive growth strategy to boost the economy, improve people's health and quality of life, care for nature, and leave no one behind.

The Farm to Fork Strategy is at the heart of the Green Deal. It addresses comprehensively the challenges of sustainable food systems and recognises the inextricable links between healthy people, healthy societies and a healthy planet. The strategy is also central to the Commission's agenda to achieve the United Nations' Sustainable Development Goals (SDGs). All citizens and operators across value chains, in the EU and elsewhere, should benefit from a **just transition**, especially in the aftermath of the COVID-19 pandemic and the economic downturn. A shift to a sustainable food system can bring environmental, health and social benefits, offer economic gains and ensure that the recovery from the crisis puts us onto a sustainable path[1]. Ensuring a sustainable livelihood for primary producers, who still lag behind in terms of income[2], is essential for the success of the recovery and the transition.

*Figure 8 Farm to Fork Strategy: opening lines (F2F, p.4)*

Going a step further, the Farm to Fork defines the overall goal of the transition as "competitive sustainability" (F2F, p.7). In every competition, however, there are winners *and* losers, and it is left to the reader to imagine who is going to be the loser in this one, arguably those who won't grasp the opportunities to strengthen the EU competitiveness: one gets the impression that farmers might be among them.

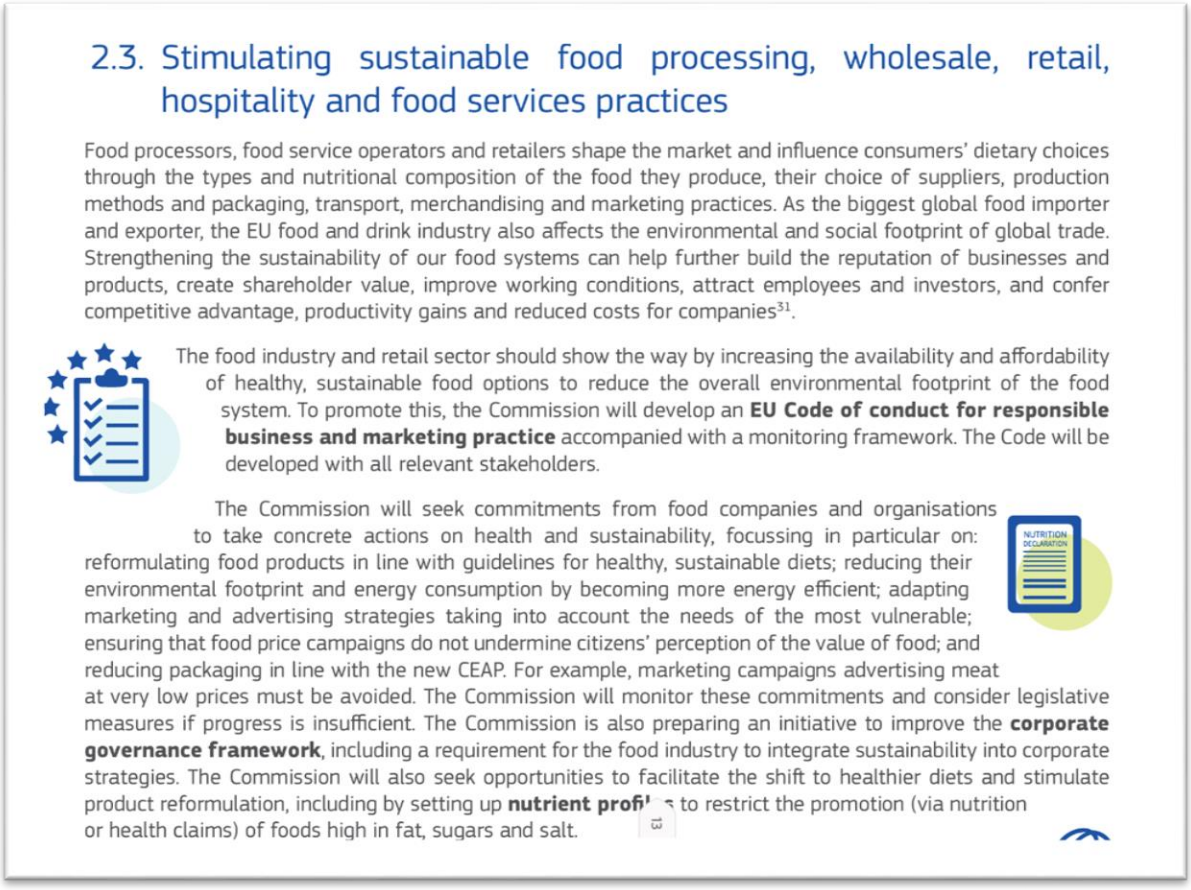
### 5.2.2 Farmers and losers

The ambition of the Strategy for farmers does not seem very high:

> ensuring a sustainable livelihood for primary producers, who still lag behind in terms of income (F2F, p. 4)
>
> **improving the incomes of primary producers** (F2F, p.6 bold in the original)
>
> guarantee a decent income [...] better targeting income support [in the CAP]. (F2F, p.11)

The claims the Farm to Fork Strategy makes for a "**just transition**" in the introductory chapter (F2F, p.4 bold in the original), appear to refer to a bare minimum, economic approach to justice. A recent report of the Institute for European Environmental Policy seems to confirm that:

> In most discussions, just transition is concerned with the socio-economic aspects of incentivising transition to take place and assisting and compensating the losers [...] both as a matter of principle and also partly in order that those hurt by change do not obstruct the necessary transition (Baldock and Buckwell, 2021, p.11).



## 2.3. Stimulating sustainable food processing, wholesale, retail, hospitality and food services practices

Food processors, food service operators and retailers shape the market and influence consumers' dietary choices through the types and nutritional composition of the food they produce, their choice of suppliers, production methods and packaging, transport, merchandising and marketing practices. As the biggest global food importer and exporter, the EU food and drink industry also affects the environmental and social footprint of global trade. Strengthening the sustainability of our food systems can help further build the reputation of businesses and products, create shareholder value, improve working conditions, attract employees and investors, and confer competitive advantage, productivity gains and reduced costs for companies[31].

The food industry and retail sector should show the way by increasing the availability and affordability of healthy, sustainable food options to reduce the overall environmental footprint of the food system. To promote this, the Commission will develop an **EU Code of conduct for responsible business and marketing practice** accompanied with a monitoring framework. The Code will be developed with all relevant stakeholders.

The Commission will seek commitments from food companies and organisations to take concrete actions on health and sustainability, focussing in particular on: reformulating food products in line with guidelines for healthy, sustainable diets; reducing their environmental footprint and energy consumption by becoming more energy efficient; adapting marketing and advertising strategies taking into account the needs of the most vulnerable; ensuring that food price campaigns do not undermine citizens' perception of the value of food; and reducing packaging in line with the new CEAP. For example, marketing campaigns advertising meat at very low prices must be avoided. The Commission will monitor these commitments and consider legislative measures if progress is insufficient. The Commission is also preparing an initiative to improve the **corporate governance framework**, including a requirement for the food industry to integrate sustainability into corporate strategies. The Commission will also seek opportunities to facilitate the shift to healthier diets and stimulate product reformulation, including by setting up **nutrient profi** s to restrict the promotion (via nutrition or health claims) of foods high in fat, sugars and salt.

13

*Figure 9 Farm to Fork Strategy: beginning of chapter on sustainable supply chain (F2F, p.13)*

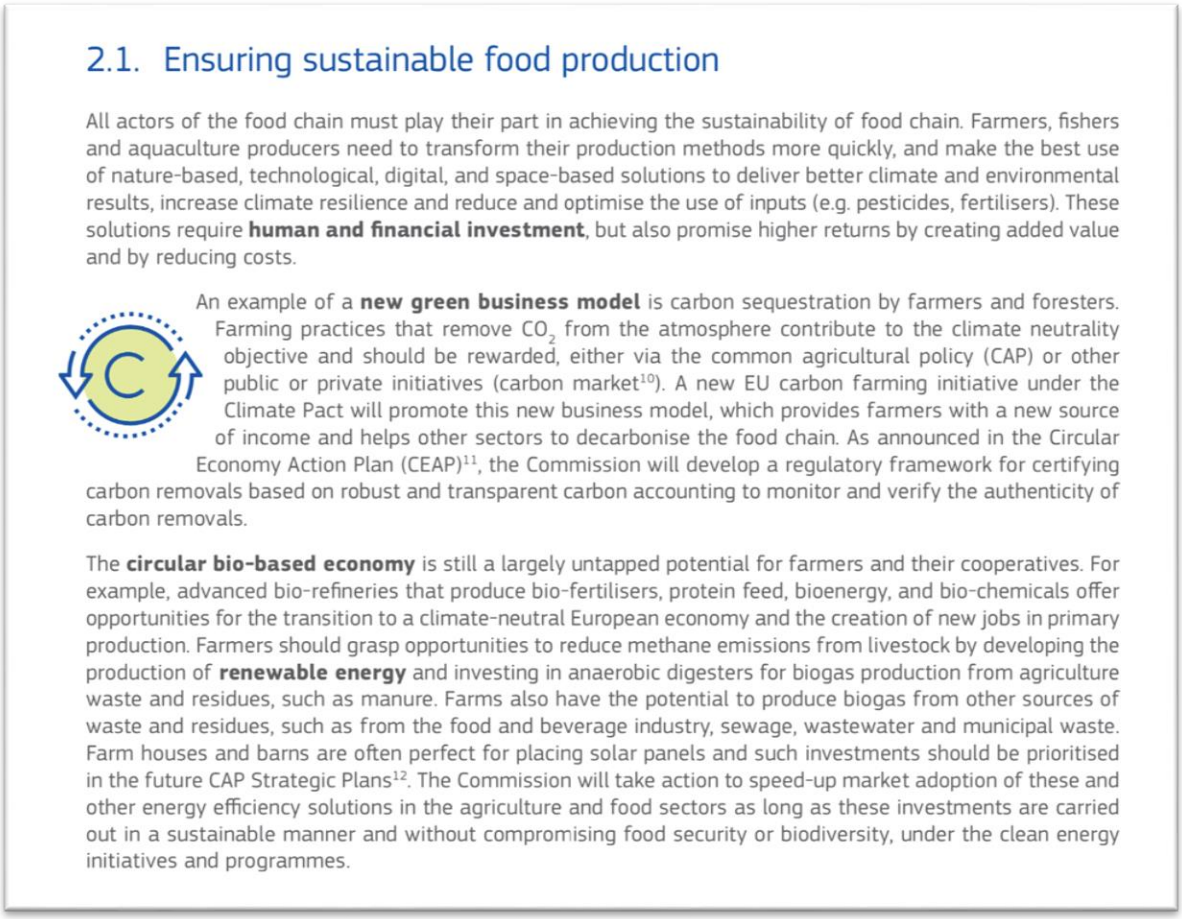
When compared with the vision for the EU food and drink industry (reproduced in Figure 9 above), the outcomes are much more ambitious, as the transition is expected to

> further build the reputation of businesses and products, create shareholder value, improve working conditions, attract employees and investors, and confer competitive advantage, productivity gains and reduced costs for companies. (F2F, p.13)

It is not only the vision of benefits to be derived from the transition that reveals farmers may be viewed as different from the rest of the supply chain. The way farmers and the supply chain are introduced, and the way problems (listed in Table 5 above and discussed later) are described also contribute to my conclusion that farmers are viewed as unsuitable market players and are bound to be losers in the race for competitive sustainability. If I look for example to how the supply chain is introduced and coaxed into taking action:

> Food processors, food service operators and retailers shape the market and influence consumer's dietary choices through the types and nutritional composition of the food they produce, their choice of suppliers, production methods and packaging, transport, merchandising and marketing practices. As the biggest global food importer and exporter, the EU food and drink industry also affects the environmental and social footprint of global trade. […] The food industry and retail sector should show the way […] The Commission will seek commitments from food companies and organisations to take concrete actions […] (F2F, p.13, also reproduced in Figure 9 )

which Mowlds interprets positively as a way of acknowledging "without vilifying – the specific role of retailers and processers, and marketing" (2020, p.20), and compare it with the equivalent



## 2.1. Ensuring sustainable food production

All actors of the food chain must play their part in achieving the sustainability of food chain. Farmers, fishers and aquaculture producers need to transform their production methods more quickly, and make the best use of nature-based, technological, digital, and space-based solutions to deliver better climate and environmental results, increase climate resilience and reduce and optimise the use of inputs (e.g. pesticides, fertilisers). These solutions require **human and financial investment**, but also promise higher returns by creating added value and by reducing costs.

An example of a **new green business model** is carbon sequestration by farmers and foresters. Farming practices that remove $CO_2$ from the atmosphere contribute to the climate neutrality objective and should be rewarded, either via the common agricultural policy (CAP) or other public or private initiatives (carbon market[10]). A new EU carbon farming initiative under the Climate Pact will promote this new business model, which provides farmers with a new source of income and helps other sectors to decarbonise the food chain. As announced in the Circular Economy Action Plan (CEAP)[11], the Commission will develop a regulatory framework for certifying carbon removals based on robust and transparent carbon accounting to monitor and verify the authenticity of carbon removals.

The **circular bio-based economy** is still a largely untapped potential for farmers and their cooperatives. For example, advanced bio-refineries that produce bio-fertilisers, protein feed, bioenergy, and bio-chemicals offer opportunities for the transition to a climate-neutral European economy and the creation of new jobs in primary production. Farmers should grasp opportunities to reduce methane emissions from livestock by developing the production of **renewable energy** and investing in anaerobic digesters for biogas production from agriculture waste and residues, such as manure. Farms also have the potential to produce biogas from other sources of waste and residues, such as from the food and beverage industry, sewage, wastewater and municipal waste. Farm houses and barns are often perfect for placing solar panels and such investments should be prioritised in the future CAP Strategic Plans[12]. The Commission will take action to speed-up market adoption of these and other energy efficiency solutions in the agriculture and food sectors as long as these investments are carried out in a sustainable manner and without compromising food security or biodiversity, under the clean energy initiatives and programmes.

*Figure 10 Farm to Fork Strategy: beginning of chapter on sustainable food production (F2F, p. 8)*

introductory statement about farmers in the food production section (reproduced in Figure 10):

> All actors of the food chain must play their part in achieving the sustainability of the supply chain. Farmers, fishers and aquaculture producers need to transform their production methods more quickly, and make the best use of nature-based, technological, digital, and space-based solutions to deliver better climate and environmental results, increase climate resilience and reduce and optimise the use of inputs (F2F, p.8)

then I must conclude that farmers are vilified, or at the very least patronised, surely considered on a different level from actors in the supply chain. That subtle difference is also reflected in the titles of the chapters: *Ensuring* sustainable food production versus *Stimulating* sustainable food processing.

Such apparent preference for the supply chain seems to indicate that power relationships in the food chain will not change, something that would be expected in a transition. Addressing power in the supply chain was also a recommendation of the SAPEA Report, advising to increase "the policy focus on food manufacturers and retailers" (European Commission, 2020d, p.38), a suggestion that was carried over in the Scientific Opinion that fed directly into the Strategy.

Instead, the strategy makes it rather obvious that it espouses the well-established trope of the agricultural modernisation discourse: *the inadequate farmer*s, unable to join in the market (Anderson et al, 2021, p.140) and on that basis addresses them as businessmen lagging behind in the ongoing competition for sustainability and in need of advice. This image of farmers as inadequate goes hand in hand with the trivialisation of small-scale agriculture say agroecology researcher Anderson and colleagues. Farmers are seen as "poor, backward, low quality, inefficient or unproductive" and farming that is not commercial as "inherently a form of drudgery". The "agency and autonomy of food producers" as skilled, resilient and creative entrepreneurs that also "help strengthen the economic viability of rural areas" is negated in favour of an interpretation of livelihood as "merely income" (ibid, pp. 138-140). This approach is apparent in the way that farming practices are described in the Strategy.

### 5.2.3 Farming practices, sustainable solutions and green business models

I have hinted above how the Farm to Fork identifies a specific subset of farming practices as sustainability problems (listed them in Table 5 above): namely, *the use*, *excessive* (item 7) or even *excessive and inappropriate* (item 9) of pesticides, fertiliser and antimicrobials. For those practices the Strategy sets reduction targets. However, I noted, quoting from Alberdi and colleagues, that no connection is made in the text between those unsustainable practices and the reason why they are utilised: the requirements of industrialised agriculture.

Considering the importance of practices in agriculture and from a Strategy that claims it

> aims to reward those farmers, fishers and other operators in the food chain who have already undergone the transition to sustainable practices (F2F, pp.4-5)

one would expect a focus on sustainable practices. However, a short list of sustainable practices first appears on page 11, halfway through the document, although a couple of those practices, carbon and organic farming, get a bit more space earlier in the text.

The farmers who undertake those practices, on the other hand, are conspicuous for their absence. The only farmers that are mentioned get talked down to for their alleged inability to keep up:

> Farmers [...] need to transform their production methods more quickly and make the best use of all nature-based, technological, digital and space-based solutions to deliver better climate and environmental results. (F2F, p. 8)

This lack of visibility of the very farmers and practices that are worth of praise is a particular shortcoming considering research indicates that change may be best stimulated by offering alternative models of what *good farming* entails, for peer-to-peer learning, as discussed in Chapter 2. Even accounting for the fact that the Strategy may not be the direct interface with farmers (the CAP may be that, together with the national strategic plans, as indicated by Schebesta and Candel, 2020, p. 586), such evident lack of positive representation is inadequate when farmers (at the very least) share responsibility for enacting the required change.

In place of farmers, it is technology that takes the stage as a protagonist of the transition, in another established tenet of agricultural modernisation: *technology-driven intensification* (van der Ploeg, 2021, p.280; Anderson et al, 2021, p.164). Photographs used in the document highlight the technological focus: an enormous harvesting machine in a monoculture field where the farmer is invisible (p.9), a farmer, seen from the back with a tablet in his hand, inspecting a plant in a vast field of immaculate monocultural rows (p.16). Similarly with regards to food: although an image of vegetables on a market stall is juxtaposed to the harvesting machine, as if to make a spurious connection between the monoculture and diverse, healthy vegetables (p.9), the photograph representing sustainable food consumption shows a mother with child in the aseptic background of supermarket aisles (p.14). The photographs are reproduced in Figure 11 below.

*Figure 11 Farm to Fork Strategy: photographs about sustainable farming and consumption*

The list of sustainable solutions that farmers are supposed to adopt is what Anderson and colleagues refer to as a *toolkit* approach (2021, p.162), in that a range of technologies are offered as if they were tools in a toolbox, a pick-and-mix set of desirable options, that adopted will achieve sustainability. Because it fails to acknowledge the political and governance implications of the adoption of different technologies and fails to address any mutual incompatibility at either the discursive or the practical level (or both) of different options, the metaphor lacks, rather than show, strategic vision. As the Strategy's toolkit apparently contains everything, from mimicking nature on earth, to space gear, in asking farmers to adopt it the Strategy suppresses the epistemic question of

"what it means to be a farmer and what it means to farm" (Montenegro de Wit, 2021, p. 2) with the associated political question of who has power to decide on those meanings.

Scrutiny of the list reveals how farmers' agency may be restricted rather than enhanced by the choices on offer. In fact, while making some concessions for nature-based solutions (which I discuss later), all proposed solutions are high-tech, and adoption of expensive technology in farming has a history of favouring large, industrially managed establishments and putting small scale, more diverse farms out of business. Winner, for example, describes in his text on the political nature of artefacts, how the mechanical tomato harvester in California led to the loss of thousands of jobs; besides, the large initial investment for the machinery, combined with cheaper costs per ton for the produce, led to a decrease in number of tomato farmers in favour of larger operations. On top of that, the machine's rough handling of tomatoes required that specially adapted varieties be bred: "a thorough reshaping of social relationships of tomato production in rural California" (1980, p. 126).

Technological modernisation also favours "increased dependency on external agents" as indicated by Van der Ploeg (2021, p. 274), which means fewer rights and less agency for farmers, but also the need to continually grow in order to keep up with indebtedness (Van der Ploeg, 2020, p. 593). This issue of indebtedness is actually acknowledged by the Strategy:

> [t]hese solutions require **human and financial investment**, (F2F, p. 8 bold in the original)

but quickly dismissed with a *promise* of better income:

> but also promise higher returns by creating added value and by reducing costs (ibid).

After the first wave of technological modernisation in the 20th century demanded that farmers outsourced "many of the tasks that make up the agricultural labour" to "outside agencies" (Van der Ploeg, 2021, p.276) - notably the seed industry as I discussed in some length - now it appears the green modernisation of the 21st century requires that farmers introduce ventures on the farm that have little to do with farming. In fact, the Strategy advises farmers to take up renewable energy production (see Figure 10 above for a screenshot of the text) in order to offset emissions from both livestock and the rest of the supply chain. For example, farmers should invest in anaerobic digesters, to process both their own and industry's waste streams, or in bio-refineries to turn waste into a plethora of inputs, which appear to be meant to impress for their "bio" credentials: bio-fertilisers, bioenergy, bio-chemicals, yet still remain the same inputs with a different name. The most important 'bio' in farming: biodiversity only makes its appearance at the end of the paragraph, when it is said that "food security or biodiversity" (F2F, p.8) should not be compromised if these "efficiency solutions" (ibid) are undertaken on farm.

Again, in financial terms, while the text highlights that there is potential in participating in the bio-based economy, this appears to bring farmers no more than a marginal benefit, rather

> opportunities for the transition to a climate-neutral European economy and the creation of new jobs in primary production. (F2F, p.8)

Taking up external ventures (much like investing in the latest technologies) is going to make farmers more dependent on outside agencies, namely, the financial sector, thus restricting their autonomy "which is the basis of their resilience", as Alberdi and colleagues note (2020), locking them in a cycle of indebtedness and growth that inevitably leads them to exceed "the limits of locally available resources" (Van der Ploug, 2020, p.597) and therefore unsustainability.

Besides, addressing farmers as business people, rather than food producers and custodians of the landscape and the biodiversity in it, is in the way of a transition to sustainable agriculture on a socio-cultural level. As I discussed before, not only does it fail to recognise the way farmers see themselves: first and foremost as food producers with skills and aims for their farms as Burton observed (2004, p. 196), but it also points them in the wrong direction as biodiversity, the landscape and even the farm itself may be largely invisible to farmers interpreting their role as that of a businessperson busy gathering financial returns, according Hunt's research findings (2010, p.423).

I cannot but interpret all of the above as the confirmation that farming, rather than becoming more biodiversity-supporting, circular and embedded in the local ecology through the transition, is expected to keep being intensively managed with inputs and waste streams. Farms are supposed to feed into the bio-based economy, locked into a system than forces them to keep expanding. Level 3 of the Gliessman scale where farming is redesigned on ecological principles is not even in sight.

#### *5.2.3.1 Nature-based solutions, GMO seeds and organic agriculture*

Nature-based is the first set of solutions indicated in the *toolkit* and it could appear to refer to agroecological practices, or the organic farming for which the Strategy sets the only positive target (as opposed to reduction targets) with regards to farming practices: reaching 25% of EU agricultural land by 2030 (F2F, p.10). However, there is not definition of the term in the Strategy, so I refer to the 2015 definition published by the EU Directorate General on Research and Innovation (DG RTD). Nature-based solutions are those that make use of

> the features and complex system processes of nature, such as its ability to store carbon and regulate water flows, in order to achieve desired outcomes. (European Commission, 2015, p.24)

Processes that artificially enhance nature are excluded from this characterisation, but - it is specified - only within the current EU framework. Therefore, it strikes me that the definition leaves the field open for the future introduction of genetic modification, and both the Strategy and the scientific advice it received seem keen on the adoption of biotechnology. In fact, the SAPEA Report, which falls under the scope of DG RTD, refers to the possible advantages of genetic modification for "efficiency and sustainability" (2020, p. 119) and the Strategy spends the most of one paragraph suggesting that gene technology is being considered as a possible sustainability solution (F2F, p.10).

Biotechnology, however, affects farmers in multiple ways, for example with regards to seed by being a driver of corporate centralisation and concentration in the seed industry (see Chapter 2.3). Alberdi and colleagues point that out in their critic of the Strategy: "gene editing remains a false solution that should not be pursued - not only in light of the judgment of the EU Court of Justice[11], but as a matter of avoiding further privatization of the food system" (2020). There are also ontological and epistemological reasons, ethical ones, why cultivated diversity is not compatible with biotechnology, and genetic modification in particular, so I look into this topic further.

Besides the direct mention, there are other subtle indications that biotechnology might be on the cards, namely, the way the Strategy describes plants and animals as contributing to unsustainability, implying that they need to be modified to be sustainable. While describing the unsustainability of agricultural practices (see Table 5, items 7-8), the Strategy appears to attribute

[11] that said new techniques (including gene editing) are sufficiently adequately regulated in current GMO legislation, so no further revision is necessary, which implies they are GMOs and not something different

plants a share of the blame for excess nutrients in the environment, in that they do not seem to be able to absorb them "effectively" (item 7). Livestock too is implied to be defective in its digestive capabilities, given that the Strategy suggests "innovative feed additives" and different and better feed (item 8) as a solution to the livestock sector's GHG emissions. Such use of language might not be innocent but tied with the *genetic resources* approach and its drive to *improve* seed (and more recently animals). Biotechnology, genetic modification in particular, promises high achievements, so the use of such language in the Strategy may be paving the way for introducing more of it, by indicating how plants and animals fall short of requirements. The European Commission has come out in favour of it before, as quoted for example by Maria Lee in the Journal of Environmental Law:

> No form of agriculture, be it conventional, organic, or agriculture using GMOs, should be excluded in the European Union. (2008, p.194)

Despite the toolkit approach to farming of the Commission, genetic modification in relation to food and plant breeding is widely contested in society "due to environmental, food safety, socio-economic and ethical concerns" (Binimelis, 2008, p. 439; see also Montenegro de Wit, 2020, p.2). Such ethical, ontological concerns are famously a tenet of organic farming. As a consequence, organic standards actually disqualify GMO-contaminated produce. The Strategy avoids using the term, referring instead to 'new innovative techniques', a common device in the ongoing political battle qualitatively to distinguish between the newest generation GMOs and the ones that people know by name and contest, and on which regulatory restrictions apply.

Despite this ethical and legal incompatibility, the two concepts of biotechnology and organic are juxtaposed in the Strategy (in adjacent paragraphs, see Figure 12 below) as if they were two equally valid, even synergistic options in a portfolio - Montenegro de Wit, calls this the *complementarity* narrative, which rests on a perspective of "technological neutrality" (ibid, p.1) which the Commission we have seen adopts in its toolkit approach as well. The narrative abstracts technology from its effects in practice and the relationships of power extant in the regime in favour of a promise of possibilities; it so-to-speak "strips away history and systems and leaves only tools" (ibid, p.5).

Climate change brings new threats to **plant health**. The sustainability challenge calls for measures to protect plants better from emerging pests and diseases, and for innovation. The Commission will adopt rules to reinforce vigilance on plant imports and surveillance on Union territory. New innovative techniques, including biotechnology and the development of bio-based products, may play a role in increasing sustainability, provided they are safe for consumers and the environment while bringing benefits for society as a whole. They can also accelerate the process of reducing dependency on pesticides. In response to the request of Member States, the Commission is carrying out a study which will look at the potential of new genomic techniques to improve sustainability along the food supply chain. Sustainable food systems also rely on **seed security and diversity**. Farmers need to have access to a range of quality seeds for plant varieties adapted to the pressures of climate change. The Commission will take measures to facilitate the registration of seed varieties, including for organic farming, and to ensure easier market access for traditional and locally-adapted varieties.

The market for organic food is set to continue growing and **organic farming** needs to be further promoted. It has a positive impact on biodiversity, it creates jobs and attracts young farmers. Consumers recognise its value. The legal framework supports the shift to this type of farming, but more needs to be done, and similar shifts need to take place in the oceans and inland waters. In addition to CAP measures, such as eco-schemes, investments and advisory services, and the Common Fisheries Policy (CFP) measures, the Commission will put forward an Action Plan on organic farming. This will help Member States stimulate both supply and demand for organic products. It will ensure consumer trust and boost demand through promotion campaigns and green public procurement. This approach

*Figure 12 Farm to Fork Strategy: GMOs, seed and organic farming (F2F, p.10)*

The complementarity narrative assumes that organic can coexist with genetically modified crops, without contamination that would render them unsalable under organic standards, the very organic standards that the EU wrote. However, contamination in practice can and does occur both through pollination and through accident. The narrative, and the Strategy, suppress the ethical debate about contamination by focussing on the "purely economic issue" (Lee, 2008, p. 193) of coexistence in practice: that is, it accepts contamination within certain thresholds as if it was no contamination at all, adopting once again the win-win logic, and avoiding accounting for trade-offs. Not only is the ethics of organic farmers negated, but the legal and financial burden of coexistence falls most likely on the farmer, says Lee (ibid, pp.208-210), reinforcing the current power relationships.

The Commission's insistence in doing more biotechnology research in the context of sustainability remains within the paradigm of industrial agriculture and maintains the balance of power in favour of corporations, not only against the agency of farmers with regards to seed breeding and farming practices, but against civil society in the decision of what sustainability means (see Binimelis, 2008, pp.451-452). In fact, EU citizens' opposition to GMOs is well documented, and referred to in the SAPEA report (2020, p. 118-120). The Report however adopts the industry approach of referring to such opposition as a consumer attitude and a question of public acceptance rather than citizens' democratic participation. In the advice to the Commission, it is assumed that citizens have to accept new technologies and the only reason they don't is because of their misunderstanding: "a mixture or rational and affective responses" (ibid, p.119). The recommendation is then to adjust communication so that it implies continuity with existing technologies in order to minimise resistance, and further to research "the emotions related to food consumption" (ibid, p.120).

I see a reflection of this depoliticised attitude towards citizens in the Strategy, where there is implicit acknowledgement of their opposition but no mention of democratic choice with regards to biotechnologies, which are mentioned in another win-win statement about sustainability

> New innovative techniques, including biotechnology [...] may play a role in increasing sustainability, provided that they are safe for consumers and the environment while bringing benefits for society as a whole (F2F, p.10)

which does not take into account any societal concerns beyond a mere "science-based risk-assessment" typical of the coexistence and complementarity narratives, as indicated by environmental scientist Binimelis (2008, p.451; see also Montenegro de Wit, 2021).

#### *5.2.3.2 What's in a farming practice: carbon farming, organic… agroecology?*

I described how the Strategy considers farming as any other business, and suggests that farmers tackle their GHG emission like any other business, with technologies for efficiency and "carbon sequestration" (F2F, p.10). But what about actual sustainable farming practices, biodiversity-supporting ones? The Strategy comes up with a rather haphazard list of sustainable practices that should be supported through eco-schemes midway through the document, another 'toolkit'

> precision agriculture, agro-ecology (including organic farming), carbon farming and agroforestry. (ibid, p.11)

I also already mentioned how there is a rather ambitious target to increase the amount of organically farmed land, and organic appears in the Strategy as "a type of farming" that "has a positive impact on biodiversity, it creates jobs and attracts young farmers" (ibid, p.10); yet, in the

list, organic only appears after precision agriculture, and conflated in the only mention in the document about agro-ecology with reference to European farming.

Coming from their same background, I can imagine how organic farmers would wonder at the Strategy's lack of recognition for the critical role of soil in organic practices. As carbon sequestration means increasing organic content of the soil, organic should be considered carbon sequestration per excellence. Agroecology researcher Miguel Altieri, for example, calculates that

> the conversion of 10000 small- to medium-sized farms to organic production would store carbon in the soil equivalent to taking 1174400 cars off the road (2008, quoted in McMichael and Schneider, 2011, p.133)

yet the Strategy makes no connection between the two, referring to carbon sequestration as a "new green business model" (F2F, p.8). WUR researchers Schulte and Wiskerke shed some clarity:

> We are missing the point if we think that the Commission's choice for organics is based on its perceived environmental credentials. The main point is that organic farming is the only system that is internationally accredited and regulated, and as such already commands a premium price that rewards farmers for their service to society. (2021)

The outcome of failed discursive anchoring for the movement, organic remains for most a product label, while carbon sequestration does not appear to be expected to deliver any other benefits than reducing emissions, helping "other sectors to decarbonise the food chain" (F2F, p.8). It is just another business option for farmers: "a new source of income", in parallel with organic, that, exactly like organic, will get its own certification scheme (ibid).

Agroecology, which I described as having good discursive anchoring and therefore should feature prominently in the Strategy, gets four mentions in all and only one for its relevance to EU farming. Another mention is related to international cooperation and two occur within the research and innovation plan of the Strategy, in the chapter by the title: *Enabling the transition* where they are discussed as in need of more supporting research. This framing did not go unnoticed - Alberdi and colleagues (2020) remark that it should be embraced as a sustainable way of faming for which there is enough scientific evidence – and is particularly interested if interpreted through the framework from Anderson and colleagues (see Table 4) about regime reactions to a successful challenge by a niche. Keeping agroecology at the trial stage in "living laboratories" could be a way of *containing* and *shielding* the niche by keeping it separate from regime solutions, namely "precision farming and use of artificial intelligence", which instead are said to be ready for "mainstreaming" (F2F, p. 16) and, indeed, front the list of sustainable practices discussed above.

#### *5.2.3.3 Seeds of transition*

Seed gets a direct mention in the Strategy:

> Sustainable food systems also rely on seed security and diversity. Farmers need to have access to a range of quality seeds for plant varieties adapted to the pressures of climate change. The Commission will take measures to facilitate the registration of seed varieties, including for organic farming, and to ensure easier market access for traditional and locally-adapted varieties. (F2F, p.10)

There is no definition of seed security so I will refer here to the FAO definition (2016), which attributes it to four characteristics: seed availability (of own or other seed), seed access (willingness

and ability to get seed from others), varietal suitability (adapted, preferred varieties) and seed quality (including germination and health). By this definition, as the Strategy does not mention availability but only access, I must take it that farmers are implied to be passive recipients of seeds, which they get outside the farm, rather than actively managing biodiversity. However, there is some recognition for the diversity of seed, in terms of traditional and locally-adapted varieties and a reference to the inclusion of heterogeneous material in the organic marketing regulation (which I discussed before and that was finalised after the release of the Farm to Fork).

As a matter of interest, a leaked draft of the Strategy from March 2020 attributed a more central role to seed, at the heart of food security, and was vaguer about the provenance of seed using the verb "rely on" rather than "have access to", possibly reflecting a more inclusive position on farmer seed systems alongside the commodity ones; it stated in fact

> Food security begins with seed security. Farmers need to rely on a diversity of quality seeds for plant varieties adapted to the pressures of climate change. The Commission will take measures to facilitate the registration of seed varieties, including for organic farming, and to ensure a lighter market access of traditional and locally adapted varieties. (European Commission, 2020c, p.6)

However, the leaked version adopted the more controversial concept of food security, while the final version refers to sustainable food systems.

There is more about seed in the Biodiversity Strategy, and I come back to it later.

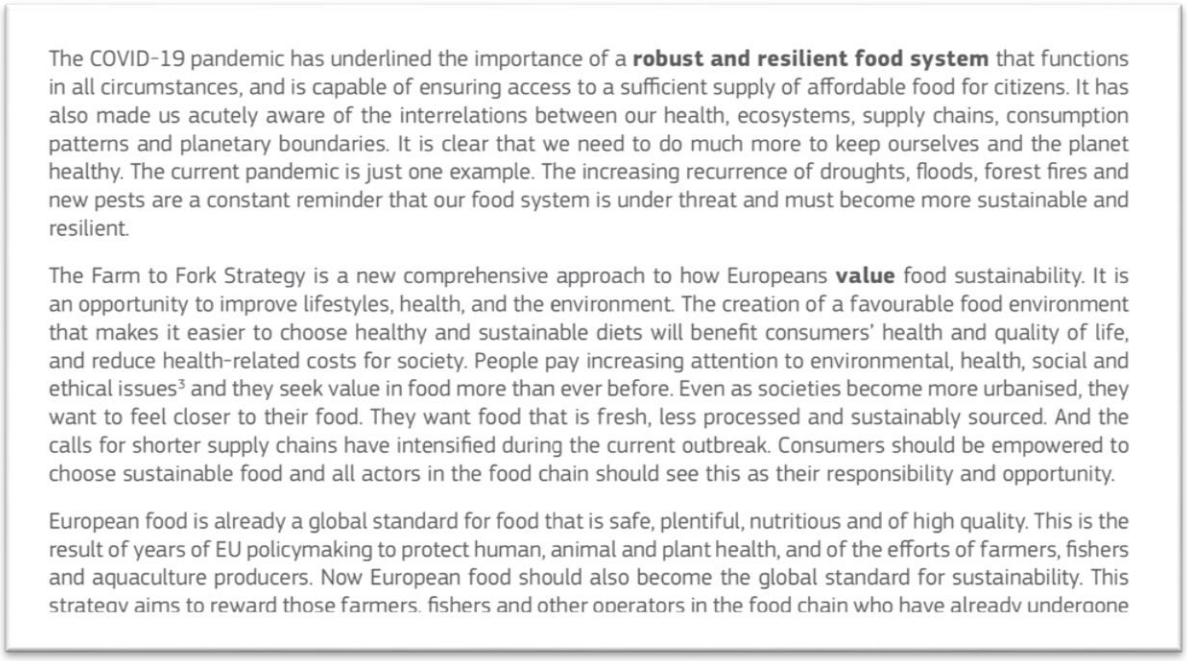
### 5.2.4 Beyond the farm: sustainable food systems and short supply chains

Because it does not identify unsustainability with the industrialisation of the food supply chain and views farms as businesses that should be made to fit in the market, the Strategy fails to recognise the benefits of shorter food supply chains and local initiatives for both farmers and sustainability. Therefore, it fails to take the lead in promoting and integrating, not only farmer-led initiatives but also other social innovation in and around food supply chains, for example food policy councils and urban food policies; it also fails to recognise the existence of "various food systems and production models in Europe", something that Alberdi and colleagues, who analysed the Strategy from the point of view of food sovereignty, point out (2020) and that even the European Parliament, commenting on the Strategy, suggested should be taken into account (2021, p.12). These have been described as having the multiple merits of helping "to reconnect food system actors (e.g. producers and consumers, citizens and local policymakers) in a way that restores democracy, accountability, and trust in food systems" (IPES-Food, 2019, p.24). The SAPEA report itself highlighted in its advice that "[l]ocal food policy initiatives have raised high expectations and have proven an experimental ground for democratic innovation (2020, p.103).

The Strategy however seems to be envisaging a unified food system under its jurisdiction, starting from the subtitle: "For a fair, healthy and environmentally friendly food system" (F2F, p. 1). The singular *food system* appears 24 times in the Strategy, mainly in reference to the EU system, however, use is not consistent, for example in the phrase "the EU's transition to sustainable food systems has started in many areas" (F2F, p.5), and the plural form is used 34 times in all, mostly when speaking in general of sustainability. In one instance, however, the plural is used in a way that recognises there exist different food systems in the EU, and that they may be of value to sustainability. The Strategy says in fact that it "will support reducing dependence on long-haul

transportation", "with a view to enhance resilience of regional and local food systems" (F2F, p.14). If anything, though, such a throwaway comment highlights how a discussion on alternative food systems and their role in sustainability was suppressed, despite their role being quite prominent in the very recent disruptions in the mainstream supply chain caused by the pandemic (as indicated for example by Bisoffi et al, 2021, p.3 and Alberdi et al, 2020), disruptions that also get a specific mention in the food security section of the Strategy (F2F, p.12).

With regards to the pandemic, the Strategy at least recognised increased public demand for shorter supply chains (F2F, p.4), even though this reference appears in a rather obscure paragraph, to which I want to draw attention because, while it most resembles a definition of sustainable food systems, the Strategy seems to be distancing itself from it.



The COVID-19 pandemic has underlined the importance of a **robust and resilient food system** that functions in all circumstances, and is capable of ensuring access to a sufficient supply of affordable food for citizens. It has also made us acutely aware of the interrelations between our health, ecosystems, supply chains, consumption patterns and planetary boundaries. It is clear that we need to do much more to keep ourselves and the planet healthy. The current pandemic is just one example. The increasing recurrence of droughts, floods, forest fires and new pests are a constant reminder that our food system is under threat and must become more sustainable and resilient.

The Farm to Fork Strategy is a new comprehensive approach to how Europeans **value** food sustainability. It is an opportunity to improve lifestyles, health, and the environment. The creation of a favourable food environment that makes it easier to choose healthy and sustainable diets will benefit consumers' health and quality of life, and reduce health-related costs for society. People pay increasing attention to environmental, health, social and ethical issues[3] and they seek value in food more than ever before. Even as societies become more urbanised, they want to feel closer to their food. They want food that is fresh, less processed and sustainably sourced. And the calls for shorter supply chains have intensified during the current outbreak. Consumers should be empowered to choose sustainable food and all actors in the food chain should see this as their responsibility and opportunity.

European food is already a global standard for food that is safe, plentiful, nutritious and of high quality. This is the result of years of EU policymaking to protect human, animal and plant health, and of the efforts of farmers, fishers and aquaculture producers. Now European food should also become the global standard for sustainability. This strategy aims to reward those farmers, fishers and other operators in the food chain who have already undergone

*Figure 13 Farm to Fork Strategy: citizien's calls for shorter supply chains (F2F, p.4)*

I am referring to a few lines in the introductory chapter which is reproduced in Figure 13 above. This paragraph comes after a few lines on food security and the pandemic, which, with a very personal register, describes how "our food system is under threat" and that "we need to do much more to keep ourselves and the planet healthy", and before a paragraph that - instead - takes the point of view of EU policy-making: congratulatory about the current high standards of food quality and pledging to address any environmental issues that are outstanding (F2F, pp. 4-5). The lines on short supply chains are however in the third person plural, which conveys a sense of detachment, both from the Strategy itself and the Europeans whose concerns it purports to represent. It goes:

> The Farm to Fork Strategy is a new comprehensive approach to how Europeans value food sustainability. It is an opportunity to improve lifestyles, health, and the environment. The creation of a favourable food environment that makes it easier to choose healthy and sustainable diets will benefit consumers' health and quality of life, and reduce health-related costs for society. People pay increasing attention to environmental, health, social and ethical issues and they seek value in food more than ever before. Even as societies become more urbanised, they want to feel closer to their food. They want food that is fresh, less processed and sustainably sourced. And the calls for shorter supply chains have

> intensified during the current outbreak. Consumers should be empowered to choose sustainable food and all actors in the food chain should see this as their responsibility and opportunity. (F2F, p.4)

To start with, the first sentence is obscure compared to the rest of the text: what is exactly "an approach to how someone values sustainability"? The third sentence in the paragraph is nominalised, so no responsibility is attributed for creating the "favourable food environment" it mentions, maybe an oblique request to "all the actors in the food chain" that are asked to step in a couple of lines later. From then onwards the use of *people*, *they*, *societies* (in the plural), *they*, *they*, and finally the passive construction starting with *the calls* makes all these concerns and preferences appear remote. The same paragraph I have just described, was considerably more straightforward, purposeful and less impersonal in the leaked draft of the Strategy, for example by referring to citizens instead of 'people', even though it still devolved rather than take responsibility:

> Nevertheless, citizens' demand is evolving. Consumers' habits are driving significant change to the food market. Citizens increasingly pay attention to environmental, health and ethical issues. They want green, organic food, with less pesticides, sugar and additives. Even as societies become more urbanised, citizens want to feel closer to their food, having it fresher, less processed and locally sourced. Consumers expect transparency across the entire supply chain to be sure that they are buying "healthy food from a healthy planet". Food processors and retailers play a key role in ensuring that such demand is met. (European Commission, 2020c, p.3)

In summary, while the concerns of the EU citizens receive here some sort of oblique acknowledgement, participation does not appear to be valued or even requested. There is mention of urbanisation, but cities' and regional government leadership in sustainable food systems does not make its appearance, in the same way as farmers' social innovation was silenced. No commitment is made, apart from the promise to cut down on long-haul transport. The opportunity for leadership is passed: the Strategy thus fails to take into account the SAPEA Report's suggestion that food systems governance transcends jurisdictional boundaries (2020, p.87, 103, 155) and strong, integrative leadership is required to bridge them (ibid, pp.18, 87, 103, 155). Instead, the Strategy decides to embrace the role of market facilitator, which I discuss below.

#### *5.2.4.1 The Strategy as market facilitator*

Not only does the Strategy fail to embrace multilevel governance and democratic approach, but the focus on competition and global leadership means there is very little consideration for other values that might support a transition. For example, mention of cooperation comes only in conjunction with international trade and innovation research, and even when it makes its appearance cooperation might not be "a carefully thought-out policy orientation", according to Alberdi and colleagues (2020). Sustainable food systems are a "global issue", something which the Strategy recognises (F2F, p. 7); yet, it appears to fail and make the connection with the need for cooperation as well as other socially supporting values to solve it, for example care, a fundamental principle of both the organic (IFOAM principles[12]) and agroecological movements (Duncan et al, 2020, p.3).

Instead, the Strategy appears to interpret its role just as market facilitator in a transition that is already undergoing (F2F, p.5). It aims at facilitating investment by corporations and providing

[12] https://www.ifoam.bio/why-organic/shaping-agriculture/four-principles-organic

access to finance for business (F2F, p.16) rather than adopting public policies, as Alberdi and colleagues also highlight (2020). It wants to reward first movers (F2F, p.4), and as I have discussed, turn unsustainability into businesses opportunities (F2F, p.5):

> [t]his strategy supports the transition by putting the emphasis on new opportunities for citizens and food operators alike. (F2F, p.6)

In line with its choice of being a market facilitator, the Strategy opts for standards as a governance tool. Standards however might not be the best approach to support the complex, contextual dimensions of sustainability and the distributed nature of the biodiversity that supports it. Standards may indeed preclude the plurality of transitional paths that several researchers consider essential to the achievement of sustainability (ie Hinrichs, 2015, p.133; Duncan et al, 2022, p.184).

#### *5.2.4.2 Governance by standards*

Standards are referred to 21 times with reference to the EU in the 23 pages of the Strategy, either highlighting the quality of current standards or suggesting that standards need revising or setting, but most notably identifying the EU role as a key player in setting global standards (F2F, p.7) and envisaging the EU food system as the global standard for sustainability (F2F, p.4, 20). Standards appear to be a domain the European Commission is comfortable with and willing to use in combination with trade agreements to establish its leadership in sustainability worldwide (F2F, p.6).

However, I have already described in relation to seeds and IPR standards, how reaping the benefits of first mover advantage by imposing existing standards in the negotiation of trade agreements may turn out to be an instrument of modern colonialisation. In the case of IPR standards most countries entering into trade agreements with the EU adopted its standards, out of convenience, even as it was damaging their own farmers' seeds systems. Only a minority of countries adopted an ad hoc sui-generis system as permitted by international trade law, arguably because of the resources and costs involved in setting up and administration. If the same happened with sustainability, another group would be destined to lose out from the competition for economic success that is - for the European Commission - the global transition to sustainability, and that is those outside of Europe that won't benefit from the 'first mover' advantage.

Standards used as a market tool promote "economic efficiency" and create value with consumers says development economist Nadvi (2008, p.325), but they are also a tool of the regime, Duru and colleagues remind us (2015, p.1244). Standard in fact embed the "biases and preferences" of those that have the power to set them (Wattnem, 2016, p. 854). As frameworks, standards generate path-dependency, becoming so ingrained that thinking outside their boundaries no longer comes naturally; they are particularly insidious, according to Wattnem, as "they deflect attention away from the rulers by displaying anonymous power" (ibid). As she analyses the concept of standards in the context of seed, Wattnem's thinking is particularly befitting the cultivated diversity perspective:

> As a noun, a standard is a set of criteria that something must meet to be considered worthy. As a verb - to standardize - the implication is that something must be made uniform (ibid. p. 853).

Because of that, the focus of the EU in setting and enforcing standards may turn out to be the very enemy of the diversity-supporting, multilevel approach that is needed to achieve transformation, in particular in view of a transition – or even transitions, plural - to biodiversity-supporting agriculture.

Seed quality standards have been in the way of cultivated diversity through the centralisation imposed by their operationalisation, and industrial standards of productivist agriculture have been affecting biodiversity in the fields because they impose centrally defined inputs and methods regardless of the local environmental circumstances. "Top-down policies tend to homogenize, in the name of efficiency gains from economies of scale and standardization" points out De Schutter while calling for a food policy that supports the existing diversity of social innovation in food systems (IPES-Food, 2019, p. 7). An example of such homogenisation to the detriment of local biodiversity-supporting innovation is described by Van der Ploeg: when the European Regulation for Rural Development (no. 1305/2013) was introduced, the Dutch government required the multiplicity of social innovators to merge in order to minimize transaction costs, which

> led to a standardization of the many localized and diverse initiatives, in order to bring them in line with the funding and control mechanisms for this regulation. This induced considerable bureaucratization leaving many of the newly merged collectives with hardly any time to engage in new, creative, initiatives. (2021, p. 291)

At the opposite end of standardisation, indicates Van der Ploeg, lies self-regulation. Multilevel governance joins the two and is better suited to deal with the context-dependent, complex and ambiguous setting of sustainability transitions (Darnhofer, 2015, p. 25). As Duncan and colleagues noted following a foresight exercise about sustainable food systems in Europe, however, the fact that a multiplicity of pathways is possible and even desirable to achieve sustainability is constantly overlooked in both policy frameworks, such as the Farm to Fork, and the political economy of food more generally (2022, p.184).

#### *5.2.4.3 Enabling the transition*

Having said they are going to reward sustainable farmers for leading the way, which I have questioned in the previous section, the Strategy indicates that it is going to "enable the transition for the others" (F2F, p. 5) and in a chapter by the same name it reveals it will achieve that through funding of research on innovation, a choice Alberdi and colleagues question for overlooking "social innovation, but also social science and humanities research" (2020). Most of the chapter is about the merits of digitalisation and data collected from farms, which is supposed to enable anything from "benchmarking of farm performance" to "precise and tailored application of production approaches at farm level and the monitoring of performance of the sector" (F2F, p.17). Any concerns about farmers' rights and ownership of the data collected from farms, which may be lost in favour of further corporate concentration and vertical expansion (as was the case with seed) are silenced.

Sharing of knowledge is the other enabler envisaged by the Strategy and a potentially excellent approach: I have described the effectiveness of peer-to-peer learning to transformational change in farming. However, the Strategy seems to favour a top-down flow from the experts to the farmers:

> [p]rimary producers have a particular need for **objective, tailored advisory services** on sustainable management choices. (F2F, p.17 bold in the original)

Agricultural Knowledge and Innovation Systems (AKIS)[13] forums may be an exception, as they appear, at least on paper, to embrace multilevel governance as well as farmer-led research and

[13] Brochure on AKIS - stimulating creativity and learning
https://ec.europa.eu/eip/agriculture/en/news/brochure-akis-stimulating-creativity-and-learning

farmer-to-farmer sharing, albeit within a productivist framework of competition. AKIS could be an example of a hybrid forum where niche and regime meet and boundaries in between are fluid. It could also be that AKIS is the responsibility of DG AGRI, while the Farm to Fork falls under DG SANTE and the two may have different stakeholders and different objectives in mind. Policy analysis would be needed to ascertain possible implications of such differences. As Duncan and colleagues point out, in fact:

> a deep understanding of policy regimes is a precondition to support policy implementation strategies that can address opponents and inertia. (2022, p.185)

The Biodiversity Strategy that I look at next, is the responsibility of yet another institution: DG-ENV.

## 5.3 FARM TO FORK VS BIODIVERSITY STRATEGY

I have expressed my hope that agriculture and biodiversity conservation might be brought together by the Farm to Fork Strategy in the unified approach of cultivated diversity. However, at least discursively, the domains and related problems remain largely separate, at the very least because the Farm to Fork delegates issues related to biodiversity to the Biodiversity Strategy and concentrates on GHG emissions reduction, while the Biodiversity Strategy only concerns itself with biodiversity in nature, wild or cultivated. As a consequence, the link between biodiversity and the supply chain beyond production is largely missing (see also the critique by Mowlds, 2020, pp. 25-27): the two documents combined fail to appreciate the dimensions of diversity in food (ibid, p.27) and ignore the changes that diverse diets would impose on the supply chain.

Having acknowledged that shortcoming, in this section I look at the text of the Biodiversity Strategy, comparing it to the Farm to Fork, with which is supposed to work "in close coherence" (F2F, p.20), at least with regards to food production. My first observation is that both the concept of sustainability and the way to achieve it are characterised rather differently in the two documents. While I was unable to find policy literature analysing the Farm to Fork and Biodiversity Strategies by comparison, so that I could verify my observations, I personally find the discrepancies in tone and language between the two Strategies heartening, as they may signal that the regime is divided, thus opening a window of opportunity for the cultivated diversity niche-regime (that is represented among others by the EC-LLD) to anchor further, and to exploit the divisions in their advocacy.

The Biodiversity Strategy refers to the same economic growth paradigm as the Farm to Fork; it makes a *business case* for biodiversity that buys into the genes as resources narrative, and it uses corporate jargon in places, for example when stating that "[t]he world should commit to the net-gain principle to give nature back more than it takes" (BS, p.3). However, it does not adopt the economic competition language; in fact, the only time competition is mentioned is about green spaces being overtaken by urban sprawl (BS, p.13). Besides, the Biodiversity Strategy hardly mentions the word transition (BS, p.7, 11, 18, 21), but appears to embrace a more cooperative stance and an appreciation of public policy to achieve what it calls "transformative change", which

> will require action by citizens, businesses, social partners and the research and knowledge community, as well as strong partnerships between local, regional, national and European level. (BS p.3)

In fact, there is a whole chapter entitled *Enabling transformative change*, arguing for "a new governance framework", defining "a clear set of agreed indicators" and "a monitoring and review

mechanism", for which supporting "administrative capacity building, transparency, stakeholder dialogue, and participatory governance at different levels" (BS, p.15) are needed. In contrast, we have seen that cooperation and participation take the backseat in the Farm to Fork Strategy. Not until the conclusions, do we see mention of the need for

> a collective approach involving public authorities at all levels of governance [...] private sectors actors across the food value chain, non-governmental organisations, social partners, academics and citizens. (F2F, p.20)

Here too, however, the Strategy fails to take ownership for governance: it continues:

> The Commission invites all citizens and stakeholders to engage in a broad debate to formulate a sustainable food policy including in national, regional and local assemblies (ibid)

When it refers to food security (even as this narrative is controversial) the Biodiversity Strategy refers to it as a moral (BS, p. 2), as well as economic and environmental imperative, while the Farm to Fork only mentions the latter two aspects (F2F, p.12). The Biodiversity Strategy also makes a clear link between climate change and biodiversity (BS, p.2).

With regards to farmers, the Biodiversity Strategy seems to attribute more agency to them and more value to their role within communities

> [a]s guardians of our land, farmers play a vital role in preserving biodiversity. [...] Biodiversity enables them to provide us with safe, sustainable, nutritious and affordable food and provides them with the income they need to thrive and develop. European farmers are an essential part of the EU's future and must continue to be the social and economic hub of many communities across our Union. (BS, p.7)

As it states, albeit vaguely, that "[b]iodiversity also [...] improves rural livelihoods and agricultural productivity" (BS, p.2) the Biodiversity Strategy might be taking a broader view of livelihoods than just the economical one adopted by the Farm to Fork. More importantly, having identified "certain agricultural practices" as a key driver of biodiversity decline (BS, p.7), the Biodiversity Strategy takes a more nuanced view than the Farm to Fork on the causes of environmental unsustainability in agriculture, while the latter, as we have seen, does not distinguish between practices at all, referring to "agriculture" in general as unsustainable (F2F, p.10). Such more nuanced view and better consideration of the role of farmers allows the Biodiversity Strategy to name agroecology - inclusive of organic (BS, p.8) as the solution, making a case for high-diversity agricultural areas (land sharing approach, see Box 3). That said, the Biodiversity Strategy takes an apolitical view of agroecology and, very much like the Farm to Fork, it refers to it as one of a range of sustainable practices, including

> precision agriculture, organic farming, agro-ecology, agro-forestry, low-intensive permanent grassland, and stricter animal welfare standards. (ibid)

It is true that precision agriculture takes pride of place in both Strategies' list of sustainable practices; notably however this is also the only mention of any technology-focussed agricultural approaches in the Biodiversity Strategy.

The difference in attitude between the Strategies is particularly evident with regards to seed, as the Biodiversity Strategy mentions genetic diversity with reference to traditional and locally adapted varieties of crops but not to gene technologies (BS, p.8), unlike the Farm to Fork, which also, as I have described previously also adopt a language that stresses the passive role of farmers on the

receiving end of breeding. Unfortunately, however, not even the Biodiversity Strategy goes on to make the link between seeds, farmers and cultivated diversity: both Strategies' plans about seeds are limited to registration and certification of seed varieties, so that marketing can be improved, but also an approach that tends to favour centralisation and commodity seed systems rather than cultivated diversity.

While the Farm to Fork did not offer much to feed optimism on cultivated diversity, the Biodiversity Strategy by comparison provides reasons for hope. The two texts, however, do not work in isolation from the policy context and wider landscape forces around the food systems. Having analysed the texts on their own, in the next chapter I look at some of the interactions and pressures in the wider context around the Strategies, from both the niche-regime on one side and the landscape on the other, taking into account the resistance in the regime, in order better to understand the prospects for cultivated diversity.

# 6 THE FARM TO FORK STRATEGY IN CONTEXT

I have introduced the Farm to Fork Strategy as a document of the regime, sitting on the policy axis of an ongoing socio-technical transition to sustainable food systems. I have also analysed how the Farm to Fork describes its role in the transition, and how the Strategy's claims to be facilitating a transition fall apart under a Critical Discourse Analysis of the trajectory implied by the narratives it adopts and the practices it supports. However, transitions are uneven in nature and their pathways complex: niches' boundaries with the regime are fluid, both niche and regime actors' strategies are varied and even at times overlapping, and the levels of interaction multiple, not least when changes in the landscape weight either in the direction of or against transformation.

In this section I want to expand on some of the forces and trends that are at play within and around the Strategy, at the level of both niche, regime and landscape, impacting on its outcomes. First of all, I take a look at recent developments that may strengthen the link between climate change biodiversity and agroecology thus favouring the establishment of cultivated diversity in both discourses and practice. Then I analyse the way niche, regime and landscape are interacting in particular around the food security narrative, impacting on the EU transition. Next, I briefly consider the wider policy context of agroecological transitions and what they suggest for effective policies. Finally, I discuss what is next for cultivated diversity, before introducing my conclusions.

### 6.1.1 Biodiversity loss, climate change and agroecology

Agriculture and biodiversity conservation, have long been considered as separate domains, one a sector of the economy and the other an environmental concern. However, in the context of climate change, there is an accelerating trend at the global level to raise the profile of biodiversity loss with regards to its impact on the climate, alongside GHG emissions. In this context, calls are increasing to look closer at the role of sustainable food systems in addressing both challenges combined.

Climate science and governance has coalesced for the last two decades around the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties, with a focus on GHG emissions and overall little consideration of food systems until 2017 (UNFCC, 2022).

In December 2020, finally, two of the most valued institutions in the United Nations, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC), organised a shared workshop, which resulted in a 'Scientific Outcome' making the case for addressing both issues in their combined complexity:

> While there is recognition in both scientific and policy-making circles that the two [climate change and biodiversity loss] are interconnected, in practice they are largely addressed in their own domains. […] This functional separation creates a risk of incompletely identifying, understanding and dealing with the connections between the two. In the worst case it may lead to taking actions that inadvertently prevent the solution of one or the other, or both issues. (Pörtner et al, 2021, p. 4)

The report also recognises the role of agroecological practices in mitigation (ibid, p.104) and was followed most recently, by the latest IPCC Climate Change 2022 Impacts, Adaptation and Vulnerability Report, one of the most valued scientific endeavours on climate change, giving

biodiversity more visibility: "This report recognises the interdependence of climate, ecosystems and biodiversity, and human society" (IPCC, 2022, p.7). The report expresses high confidence that

> [a]groecological principles and practices [...] and other approaches that work with natural processes support food security, nutrition, health and well-being, livelihoods and biodiversity, sustainability and ecosystem services. [...] These services include pest control, pollination, buffering of temperature extremes, and carbon sequestration and storage. (ibid, p.24)

In the international climate context, thus, climate change, agroecology and biodiversity are being linked and an approach closer to the Biodiversity Strategy may as a consequence get traction. There remain however, powerful pressures from the regime, which I will briefly outline in the next section

### 6.1.2 Niche, regime and landscape interactions: the food security narrative

When analysing the Farm to Fork Strategy's text I noted that despite all the claims for a transition to sustainable, just food systems, the Strategy is very much on a trajectory for business as usual, with minor 'greening' adjustments. However, reception of the text has prompted some strong negative reactions in regime players. These, out of vested and political interests, have mobilised the food security narrative in support of a sustainable intensification trajectory with some success, helped in their effort by the changing world circumstances, what MLP refers to as changes in the landscape.

The Farm to Fork Strategy have been said to be challenging the food security narrative in favour of sustainability, for example by Duncan and colleagues (2022, p. 184) and that might be why regime actors perceive it as a threat. One such actors has been COPA-COGECA, the European farmers' association, which has opposed the Strategy since its inception.

The first time COPA-COGECA intervened against the Strategy, was shortly after a draft copy was leaked in March 2020, revealing which agricultural targets were under consideration. As the SARS-CoV-2 pandemic hit Europe, the EU announced it had to postpone the launch of the Strategy for lack of capacity and to take account of developing circumstances (Foote, 2020c). COPA-COGECA took the opportunity to contact the chair of the AGRI Committee in the European Parliament, asking that an impact assessment be carried out in advance of releasing the Strategy. EURACTIVE quotes the Secretary General of the association:

> If the proposal were to continue, this would show sheer ignorance and disregard for the reality of the situation that agriculture and other primary sectors are facing at the moment.

He seemed particularly alarmed by the reduction targets for pesticides, fertilisers and antibiotics, and mobilised the food security narrative, stating that such targets would cause a crisis putting

> both the single market and international markets at stake, threatening supply chains, jobs and ultimately EU food security. (Foote, 2020b)

Europe has been very concerned with feeding its peoples since the world wars, and the EU agricultural policy, the Common Agricultural Policy (CAP), has developed with food security as its core, embracing the tenets of the Green Revolution which promised to achieve just that. Food security has been described by Zahrnt of Political Economy think thank ECIPE as

> the most pervasive and powerful argument of those calling for the protection of EU agriculture. (2011, p.2)

Even though the EU is no longer at risk of food security (ie Commissioner Sinkevičius quoted in Fortuna, 2020b) the "spurious power of food security rhetoric" (Zahrnt, 2011, p. 4) and its effects on the market persists:

> Such references to food security are powerful in the debate because they draw on past, present and future concerns. The recollection of the food shortages after the Second World War stirs dreadful memories, still alive among the elderly and deeply engrained [sic] in our cultural heritage. The pictures and reports of hungry protesters in developing countries give an emotional, present-day reality to the issue. And threatening megatrends - population growth, water scarcity and climate change - nourish fears that the specter of famine might come to haunt Europe again. (ibid, p.5)

COPA-COGECA had the support of the right-wing and majority party in the European Parliament, EPP, eager to avoid binding targets and economic damage for their constituents. They too mobilised the narrative (Foote, 2020a). MEP Tertsch of EPP, in an opinion piece on EURACTIVE whipped up as much fear as possible, appealing to food security and the yield-gap narrative I mentioned before, launching on reputational attacks both of civil society organisations and the EU itself, referred to (in what as become a common populistic stance) as a faceless institution remote from the local concerns of citizens: 'Brussels'. He stated

> There were few dissenting voices in May when the Commission published its Farm to Fork action plan to massively overhaul European farming. The F2F strategy got rave reviews from the green deal fanatics and followers of the new green religion. [...] Our responsibility is different, we need to look at the global picture assessing the broad economic and social impacts of all this Brussels-based green (planning and social engineering) production.
>
> The COVID-19 crisis has shown that the EU cannot afford to endanger its own food production. [...] Conventional agriculture, as well as biotechnology, can perfectly coexist with the organic model to achieve agriculture sustainability.
>
> In organic farming, average yields per hectare are about 30% lower than those of conventional farms although using more water, soil and energy. Are Europe's farmers – many of whom are barely getting by today – supposed to somehow make it with a 30% cut in revenue? Or would Brussels advise them to simply raise the prices on the food they sell by 30%? The cost of food may be a minor detail if you take most of your meals dining out on an expense account. But this will bust the budget of families already struggling to meet food costs. (2020)

Among his arguments appear the coexistence narrative of organic and biotechnology, for which the Farm to Fork Strategy implies support, providing a handle the regime, which has been exploited within a food security discourse both inside and out of the EU, for example by the US Secretary of the Department of Agriculture, concerned about trade barriers. EURACTIVE notes:

> According to Perdue, there is no way to achieve food security for a growing population with rising needs if policies are imposed that "restrict growth and stifle innovation," highlighting that the successes of US agriculture are due to an emphasis on innovative techniques. (Foote, 2020d)

The US went on to publish study *Economic and Food Security Impacts of Agricultural Input Reduction Under the European Union Green Deal's Farm to Fork and Biodiversity Strategies* (USDA, 2020).

Representatives of civil society, however, had supported change, calling out the spuriousness of the dichotomy between food security and environmental concerns (Fortuna, 2021). A group of forty organisations made contact with Frans Timmerman, the vice-president of the Commission, who is in charge of coordinating the Strategy and the Strategy went ahead (Fortuna, 2020).

A few months later, in October 2020 Wageningen University's journal *Resource* announced that two impact assessment studies had been published by the University, on commission respectively by COPA-COGECA and CropLive Europe, the association of crop protection businesses, which revealed yields would be negatively affected if the targets in the Farm to Fork were implemented, leading to increasing prices and more reliance on imports (Sikkema, 2020). COPA-COGECA had got themselves the impact studies they wanted, and authoritative figures to brandish.

The argument about decreases in yield, fuelled by both the WUR and the US studies, flared up once again in 2022, with the Russian war in Ukraine, one of the world producers of grains and seeds. COPA-COGECA and allied lobbies claimed once again that food security was at stake, in fact not only that, but the whole EU "strategic autonomy", advocating anew in favour of productivity for food security and adoption of biotechnologies (Bounds, 2022) as the battle for power of the seed industry, headed by agrochemical companies continues.

Timmermans, attempted to reassert the Farm to Fork's interpretation of the food security narrative, which incorporates environmental concerns, and called out the scaremongering:

> If we don't understand that the Farm to Fork is an attempt to save agriculture, not punish it, in light of the devastating effects of biodiversity loss and climate change on food production globally, we are really in a wrong attitude. (Foote, 2022)

But the landscape is changing on multiple fronts and agriculture "remains a powerful geopolitical tool" (Fortuna et al, 2022) besides being a way to mitigate climate change. The recent French elections for example depended on the farmers' lobby, which may have influenced running President Macron's pro-review stance with regards to the Strategy (Bounds, 2022). Regressive populism has also been deployed with success to manipulate farmers' general discontent with their lot, which has resulted in waves of protests across Europe in the last few years, for example those explored by Van der Ploeg that were fuelled by a malleable narrative of *agribashing*, picturing farmers as the victims of both elites and consumers, governments and climate change alike (2020). Claims that food security is going to increase with less reliance on agricultural inputs and international imports and that Ukraine's grains serve mainly the purpose of animal feed for intensive livestock production (thus industrial agriculture) rather than food security, did not have enough balancing effect this time round (Foote, 2022). The EU announced revisions and delays in relation to the Farm to Fork Strategy and its targets, and suspended some of the environmental provisions in the Common Agricultural Policy to boot (ibid; Bounds, 2022).

Anchoring of the Farm to Fork Strategy, after all, may have not been so strong. Schebesta and Candel for example, made the point that the institutional embedding of the Strategy with the Directorate-General for Health and Food Safety would make it predictable that turf wars on ownership would take place even just within the EU, for example with the Agriculture and Rural Development DGs that has "traditionally been very receptive to farmers' interests and shielded agricultural policymaking from the involvement of other Directorate-Generals." (2020, pp. 587-588) They also note that the multiple dimensions of sustainability make for difficult balancing of mandates, both internally within the EU institutions and between EU and Member States, and that, as I just described, the different political viewpoints in the Parliament would create tensions (ibid).

Transition management postulates that transition can be nudged in the right direction and the opposition of the regime can be managed. In the next section I look in more detail at advice from the literature.

### 6.1.3 Political agroecology and agroecological transitions

Both grey and academic literature on agroecological transitions is growing at pace (Anderson et al, 2021, p.43), and, although some may be co-opted, political agroecology is also gaining ground and offering insights and perspectives for effective policies and stressing the role of power in transitions.

Since the 2008 IAASTD report (International Assessment of Agricultural Science and Technology for Development), which was famously followed in 2011 by De Schutter's report as a Special Rapporteur on the Right to Food titled *Agroecology and the Right to Food*, policy advocacy about agroecological transitions has been increasing, both at the global level, in the context of sustainable development and the UN, and in the EU more specifically, where it has coalesced with calls in support of a common food policy. More recently, it has been echoed by advisors to the EU institutions, since at least the 2011 3rd Foresight Exercise of the European Union's Standing Committee on Agricultural Research, according to Michel Pimbert, director of the Centre for Agroecology, Water and Resilience at Coventry University (CAWR). The Report called

> for research to create 'radically new farming systems' that must 'differ in significant respects from current mainstream production systems' [...] High priority should be given to approaches that 'integrate historical knowledge and agroecological principles' (2015, p.286)

IPES-Food, an independent panel of experts created in 2015 and chaired by De Schutter, has been particularly active in analysis to shape the debate from the perspective of political agroecology and are widely quoted in literature. Three of their reports are particularly relevant to the EU transition:

- *Uniformity to Diversity* (2016) which analyses the lock-in mechanisms in industrialised agriculture before suggesting how to enact a transformation towards diverse and localised food systems, having acknowledged that "alternatives are emerging through the cracks of industrial food systems" but not establishing fast enough by themselves (ibid, p. 65)
- *Too big to feed* (2017) which focusses on the concentration of power in industrial agriculture, and suggest interventions on legislation in areas that traditionally do not pertain to agriculture. For example, creating an anti-trust environment that works across jurisdictions and that considers cumulative effects as well as individual mergers or shifting to a "wide-tech paradigm" (pp. 79-85)
- *Towards a common food policy for the European Union. The Policy Reform and Realignment That Is Required to Build Sustainable Food Systems in Europe* (2019) the outcome of a participative exercise specific to Europe that goes in some details on where reform is needed and how to govern it, for example addressing broader societal such as those that see cheap calories as "a substitute for social policies". (p.68)

The social sciences are increasingly taking a stand in the debate. Hinrichs' address to annual meeting of the Agriculture, Food and Human Values Society in Michigan in 2013 I already quoted, in which the sociologist drew attention to the importance of highlighting questions of politics and power, digging deep in the meanings of sustainability and the trade-offs they entail. She exhorted:

> We should bring overlooked, even difficult data, concepts and principles to the table. (2014, p.152)

A book on agroecological transitions published by CAWR in 2021 highlights the political nature of discourses and practices, suggesting that governance need to take a long-term perspective as "[c]hanges in political winds can easily wipe out progress" (Anderson et al, 2021 p.168) and be aware of power relationships and the mechanisms that the regime adopts to preserve the status quo. The SAPEA Report also refers to those obstacles to transition:

> barriers to action or resistance to change [...] include a lack of coordination based on complex governance structures and a complicated regulatory environment which hinders the development of joined-up thinking, together with potential conflicts of interest where powerful actors can block change [...] radical change is also hampered by vested interests, strong cultural determinants and the prevalence of short-term over longer-term time horizons. (2020, p. 26)

The Report also provides evidence for multilevel, adaptive governance and "integrative leadership" (ibid, p.87), which highlights the role of social innovation and the need to support it.

Suggestions for new research agendas for the European Union are being issued, and new science-policy interfaces developed: for example, the *5th SCAR Foresight Exercise*, that took place around the launch of the Farm to Fork Strategy and specifically considered how to enable transitioning towards "a safe and just food system" (Duncan et al, 2022, p.183). In a summary paper, researchers associated with the SCAR Report make the case for the democratic directionality of transitional pathways, like Hinrichs they refer to "transitions" rather than "transition", highlighting the contextual nature of sustainability and therefore the need for multifaceted solutions.

With regards specifically to cultivated diversity, EU funded projects have been researching and advocating for cultivated diversity since the late 2000s. Most recently, project DIVERSIFOOD (Fehér et al, 2019) and Dynaversity (2021), which was still running at the time of the launch of the Farm to Fork also argued for more support for multi-actor initiatives as well as supporting farmers' right to participate in both breeding and decision-making, as per ITPGRFA commitments. Their advocacy was taken up and forward by EC Let's Liberate Diversity, which I discuss next.

### 6.1.4 Cultivated diversity: onwards from the Farm to Fork Strategy

The Farm to Fork and Biodiversity Strategies' focus with regards to seed remains the registration and certification of varieties, which I have argued tends to favour centralisation and the commodity seed systems. Not even the Biodiversity Strategy goes far enough to support cultivated diversity. Even with such shortcomings of both discourse and regulation in mind, it is however worth noting how the recognition of seed diversity in the Biodiversity Strategy functioned as institutional anchoring even as the Farm to Fork confined seed diversity within the bounds of a productivist, genetic resource discourse and both Strategies took an apolitical stance on seed. The institutional anchoring had a normative aspect too (see Table 3) in the inclusion of heterogeneous material in the new organic regulation (which came into force at the beginning of 2022): a success and possible first step in the direction of a transition for the EU-funded cultivated diversity projects advocating for it.

The EC Let's Liberate Diversity (which represents the networks developed around EU funded projects and takes their advocacy forward) defines the publishing of the Strategies a "relative success for crop biodiversity" and appreciates the recognition of the farmers' role as custodian of

biodiversity in the Biodiversity Strategy. They interpret the attitude of the Farm to Fork towards biotechnology as "cautious and less prominently positive than previous leaked version of the Strategy" and expect that thanks to its more nuanced view of agriculture and the role of farmers:

> [t]he Biodiversity Strategy will thus greatly influence the Strategic Plans that will be adopted under the future Common Agricultural Policy, signalling a tough battle between DG ENV [leading on the BS] and DG AGRI [responsible for the CAP] on the topic. (2020a)

Their interpretation suggests that while the Farm to Fork Strategy remains embedded in the productivist framework, there may be reasons for optimism for cultivated diversity in the power gaps between departments and domains and in leveraging any successes in future advocacy. For example, a few months after the release of the Farm to Fork Strategy, the EC-LLC published a further update on the pulse of the situation in Brussels, stating:

> As the Strategy specifically mentions the importance of crop diversity and seed security, and that the Commission has ensured that it will take measures to ensure easier market access for traditional and locally adapted varieties, it is important that this aspect of the Strategy is also highlighted in the European Parliament report.
>
> The European Council of Ministers, in its Agriculture configuration, is also currently preparing its reaction to the Commission's Strategy. At the time of writing, leaked draft Council conclusions expressly "call for the Commission, together with the Member States, to work on the issue of genetic diversity, e.g. with a European strategy for genetic resources for the agriculture and food sector". Should the conclusions be adopted, the inclusion of such a statement could be used in future advocacy for crop diversity. (2020b)

The Parliament Initiative Report did indeed pay considerable attention to seed and their diversity, a success for advocacy efforts, as it refers to biodiverse seed in four paragraphs as follows:

> 32. Underlines the importance of ensuring the security and diversity of seed and plant propagating material to provide stable yields and plant varieties adapted to the pressures of climate change, including traditional and locally-adapted varieties, and varieties suitable for organic production and low input farming systems, while ensuring transparency and freedom of choice for farmers and access to genetic resources and innovative plant breeding techniques in order to contribute to healthy seeds and protect plants against harmful pests and diseases and to help farmers tackle the growing risks caused by climate change, ensuring an incentive for open innovation through plant variation;
>
> 33. Raises awareness of the potential negative effects of concentration and monopolisation in the seed sector and calls on the Commission to take measures to counter them if necessary; emphasises, in this context, the importance of open innovation through plant breeders' rights and notes with concern the detrimental effect of wide-scoped patents in the seed sector; believes that non-commercial production and use of traditional and locally-adapted varieties of seed by private citizens and smallholders should not be subject to disproportionate EU and national regulation; stresses the importance of preserving a strong single market for the EU seed sector;
>
> 34. Calls for strengthened coordination at EU level to stimulate the preservation and sustainable use of genetic diversity and for the establishment of a common EU platform for information exchange on preserved genetic resources;

> 35. Welcomes the announcement of the revision of marketing rules for traditional and locally-adapted crop varieties in order to contribute to their conservation and sustainable use; stresses the need for measures to facilitate the registration of seed varieties, including for organic farming, and to ensure easier market access for traditional and locally adapted varieties (2020, pp. 22-23).

The Council of the European Union also released their reaction as expected, thus providing advocates for cultivated diversity with a further tool for their advocacy.

> (23) CALLS ON the Commission to take concrete actions for ensuring the protection, restoration and sustainable use of plant and animal genetic resources. INVITES the Commission to present a EU strategy for genetic resources for aquaculture, forests and agriculture that is based on the work of the Commission on Genetic Resources for Food and Agriculture of the FAO. As a result, primary producers should benefit from easier market access to cultural, climate and locally adapted varieties and breeds. WELCOMES, in this context, the Commission's objective of facilitating the registration of seed varieties, including varieties used for organic farming. (2020, p.8)

The inclusion and/or exclusion of biodiverse seed in different documents of European institutions shows how the boundaries between niche and regime are fluid and permeable, and how the Farm to Fork Strategy has opened a hybrid forum, which Elzen and colleague argue has a "crucial role in bringing about various forms of anchoring" (2012, p.1), even if the specific support the Strategy offers is limited and circumscribed within the regime paradigms. The Strategies are after all regime documents. The fact that seed diversity has made its way in the Biodiversity Strategy, despite all the politics around the document, shows that mainstream power in relation to narratives may be giving way in places, and there appears to be political will in the Parliament to listen to the cultivated diversity constituency. From this new standpoint, cultivated diversity can advocate for further legitimacy.

This cyclical nature of anchoring of niche practices is described by Van der Ploeg (although not in MLP terms). He observes that whenever a niche anchors to the regime, be it successfully or through co-option, it has in any case opened "new spaces for contestation, negotiation and creating alternatives" and their example will stimulate further innovation and further resistance "inside, around and/or as a result of" it. "Thus the cycle [...] is repeated in a myriad of different ways" (2021, p.291). The Farm to Fork and Biodiversity Strategies are no end point for advocacy on cultivated diversity, in particular as they are not binding documents. They are however catalysts for the development of future policy.

With regards to seeds, for example, a revision of the EU seed marketing legislation is ongoing to smooth out internal inconsistencies and integration with other legislation. EC-LLD has been taking an active part in advocacy around this change and issued a *Joint Letter to the European Commission: A Common Vision for Cultivated Plant Diversity*. In the letter, the acquired successes in the new organic regulation together with the claims in the Farm to Fork and Biodiversity Strategies about seeds and organic farming form the basis for further advocacy. Appeals is also made to the international commitments the EU has undertaken on farmers rights but has yet to put into law:

> Any reform of the seed marketing legislation must advance **the European Green Deal, its Biodiversity and Farm to Fork Strategies, and the EU's climate change targets by promoting farmers' rights to seeds, and seeds that owing to their genetic diversity facilitate low input, organic, and agroecological farming practices**. It must respect and

> support the stimulating developments of the new Organic Regulation, and also recognise the considerable and costly burdens placed on the production and movement of seeds under the new Plant Health Regulation, particularly for smaller operators. It must be consistent with the commitments made under the ITPGRFA, and the Convention on Biological Diversity. **Last but not least, it must enforce the right to seeds and the obligations of states to facilitate and respect this right under the UNDROP**. (2021, bold in the original)

Seed marketing and organic farming are not the only policy streams around the Farm to Fork Strategy where the battle for seed diversity is fought. I have argued that the legislation on biotechnologies is a particular fighting ground for the regime, as the Farm to Fork paves the way for coexistence of new breeding techniques with organic farming, while only superficially acknowledging societal concerns. The European Parliament Initiative Report, despite the extensive references to seed diversity and apparent will to address concentration in the seed market, also mentions "innovative plant breeding techniques" (art 32 above). These contrasting arguments in the Parliament reflect the struggles for a definition of sustainability between corporations and civil society, the regime and the biodiversity-supporting niche-regime, what Van der Ploeg refers to as "a permanent socio-political struggle" (2021, p.292).

The study in support of biotechnology referred to in the Farm to Fork Strategy was published in April 2021: it confirmed what the Farm to Fork had already announced, at least according to EC-LLD:

> The main findings of the European Commission are that NGT [nda new genetic techniques] products have the potential to contribute to sustainable food systems with plants more resistant to diseases, environmental conditions and climate change effects. [...]
>
> At the same time, the study also highlighted concerns associated with NGT products and their current and future applications. Concerns included the possible safety and environmental impact, for example, on biodiversity, the coexistence with organic and GM-free agriculture, as well as labelling. However, the study finds that "there are strong indications that the current 2001 GMO legislation is not fit for purpose for some NGTs and their products, and that it needs adaptation to scientific and technological progress". (2021b)

An attempt at deregulating biotechnologies, on account that the new techniques are not comparable to old GMOs (see also Montenegro de Wit, 2021), this is another instance where the balance of power remains skewed toward corporations and sustainability discourses remain enslaved to economic growth and technological innovation. In this socio-political struggle, to quote Van der Ploeg, EC-LLD can only work with the rest of the niche-regime of biodiversity-supporting agriculture to offer "an alternative that is increasingly convincing" (2021, p. 293).

# 7 DISCUSSION

My research attempted to answer the question whether the Farm to Fork Strategy opened a window of opportunity for sustainable, biodiversity-supporting agriculture to establish and replace the mainstream productivist model that has resulted in environmental damage in the form of climate change and biodiversity loss, as well as fostering social injustice. I did ask whether the Strategy was actually leading a just transition to sustainable agriculture as it claims to be doing.

Sustainability is a contested concept, so the first part of this document was devoted to defining my perspective on it. Agricultural sustainability is for me the outcome of cultivated diversity, an approach that looks at biodiversity as something that humans are part of and co-create and nurture through their interventions on landscapes, and for which farming is therefore a privileged interface. Seed sits at the heart of cultivated diversity, having evolved with human communities since the dawn of agriculture. For its importance in human societies, it has become a political artefact, through which power is wielded by an increasingly centralised and concentrated seed industry that imposes a model of farming and social values that are not compatible with diversity.

Things are, however, changing. Increasing awareness of the effects of human activities on the climate and biodiversity has prompted resistance: farmers and civil society, supported by academia, are claiming the seeds back, and proposing agroecology as an alternative to the productivist, unsustainable and unjust model of agriculture. I wrote another chapter of this document to explore how systemic change happens. For the purpose, I adopted a middle range theory that looks at change as a transition from a regime to the next under pressure from innovative approaches on the one side, and the wider landscape of world changes on the other. The two combined help widen the cracks that internal weaknesses have already form in the power structures of the regime and the values that underpin them. Such theory is known as the Multi-Level Perspective of Socio-Technical Transitions (MLP). Approached from a structuration perspective (for example Gaitán-Cremaschi, Darnhofer, Duru, Avelino and Rotmans, Elzen and their colleagues), the MLP applied to sustainability transitions offers insights on the different levels at which change may be facilitated or hindered. In particular, researchers indicate that core determinants for change can be found in the definition of sustainability itself, the policy and governance institutions that support change, as well as the power relationships that might hinder it, for example through co-option of practices or the use of narratives and framings that help gain legitimacy for them.

Inspired by such insights, I formalised the objectives of my research in five main questions:

- How does the Strategy define 'sustainability', the goal it is trying to achieve?
- What transformational trajectory is the Strategy aiming for, that is: what problem is it trying to solve and how?
- What relationships of power are going to determine the outcome of the transition?
- What narratives and framings are leveraged to define the direction of the transition?
- What impact does the relationship between discourse and practices have on the transition?

which I set out to answer through Critical Discourse Analysis in the tradition of interpretive policy.

The Farm to Fork Strategy (together with the Biodiversity Strategy with which it is supposed to work in tandem) is in fact a policy document, an agenda setting exercise that the European Commission has issued in response to the need for change in the regime approach to food and

agriculture. Such change is needed to respond to and mitigate the combined effects of climate change and biodiversity loss that are threatening our existence and are combining with increasing societal issues related to poor diets and injustice in the regime food system. These are pressures at the landscape level, prompting the regime to take heed of what is happening at the niche level: in agroecological and organic farming as well as networks supporting cultivated diversity and so-called Alternative Food Networks (AFNs), which are increasingly bridging their differences and emerging, often thanks to governance leadership from cities and regions, as a niche-regime, challenging the regime proper.

Aware of the undergoing change, the Strategy embraces the discourse of transitions and chooses its role as that of rewarding first movers in sustainability as well facilitating the transformations for those that are still lagging behind. On top of that, the Strategy aims to lead a global transition by making use of its leverage with international trading partners to promote sustainability. In my Critical Discourse Analysis (CDA) of the text I challenge the Strategy's claims about its role in the transition and its support of it, by comparing them with recommendations from the literature, taking cultivated diversity as the desired outcome of change.

In my undertaking I was guided by a framework built on two existing models: the What's the Problem Represented to Be? (WPR) approach to policy analysis by Carol Bacchi taught me to look at the text itself and the wider policy context in which it is embedded asking questions about power relationships and the structures that hold them in place. CDA, as formalised by Hutchin, helped me find the answers by looking at words, language and narratives in the text, and the meanings they conveyed. However, I did not limit myself to the meaning of words but looked also at the practices they implied, borrowing from the perspective of Schneider and McMichael (2010) that the ecological impact of agriculture, and thus impact on biodiversity, is determined by the nature of the practices that constitute our interactions with the landscape.

In the next section I summarise my findings, answering the research questions.

## 7.1 How does the Strategy define 'sustainability', the goal it is trying to achieve?

The Strategy does not define sustainability, an exercise it defers in time and a shortcoming for which it has been called out by critics (i.e. Alberdi et al, 2020). What it does, however, is adopting the common trope of referring to challenges in the food systems as business opportunities (McMichael and Schneider, 2011) delivering benefits to all concerned: primary producers and businesses, citizens and workers alike, society together with the economy and the environment.

In order to support such optimism, the Strategy draws from two mainstream, connected narratives, that are popular with regime actors engaging in sustainability, for example the UN (as discussed in Purvis, 2019). The first narrative is the so-called *three-pillars approach* that interprets sustainability as the intersection of economic, social and environmental outcomes. Purvis and colleagues, who analysed the origin of the metaphor, criticise it for presenting what are often three mutually exclusive objectives, about which political trade-off decisions need to be negotiated, as equally important goals whose simultaneous achievement is a "benign necessity" (2019, p. 12). This unquestioning approach is often referred to as the *win-win* paradigm. While win-win situations "may exist under certain conditions" concur Hahn et al (2010, p. 219) who studied the approach in the context of corporate sustainability, acting only on the minimum common denominators

between social, economic and environmental priorities falls well short of achieving the transformational change needed for sustainability. In fact, they argue, regardless of its claims, this approach generally ends up considering social and environmental outcomes as subordinate to the economic ones. Economic growth takes pride of place in the Farm to Fork too, as I describe next.

## 7.2 WHAT TRANSFORMATIONAL TRAJECTORY IS THE STRATEGY AIMING FOR, THAT IS: WHAT PROBLEM IS IT TRYING TO SOLVE AND HOW?

The Strategy sets the goal of the transition, which it wants to facilitate, as "competitive sustainability" (F2F, p.7) and indeed it appears to be making of it a competition for economic success. In the process, it largely silences the fact that change implies winners and losers. However, we can derive by implication that there may be two major categories of losers: farmers in Europe, namely the small-scale ones and smallholders, and those outside of Europe that will not be benefiting from the *first mover effect* that the Strategy touts as the mark of success. Competitive sustainability means for the Commission that GHG emissions should be reduced to levels that do not affect the climate, while keeping Europe on a path to economic growth: this presupposes for agriculture a 'producing more with less' narrative of sustainable intensification, within the existing parameters of regime agriculture, including technological 'modernisation'. No fundamental shift from the principles, practices and governance that keep the regime socio-technical system in place is advocated, therefore no transition.

The Farm to Fork is on a pathway of trajectory adjustment only, something that is particularly obvious when one reads it from the perspective of cultivated diversity, as achievements in biodiversity conservation are completely delegated to the Biodiversity Strategy rather than integrated in its own objectives. In particular, seeds remain the preserve of the seed industry, tasked with delivering 'quality' with the newest technologies. Diversity, it appears from the Strategy, can be reintroduced in the commodity seed system by redefining the criteria of established quality standards. The role of farmers in the management of seed and biodiversity more generally is only recognised in the Biodiversity Strategy, which argues in favour of agroecology for the management of the landscape. Neither Strategy, however, seems to make provisions for farmers' involvement in seed selection and dynamic management, that is cultivated diversity.

### 7.2.1 What relationships of power are going to determine the outcome of the transition?

The Strategy appears to interpret its role as that of market facilitator in the ongoing transition: rewarding the first movers while enabling others to take advantage of business opportunities. It does however not front farmers, not even the ones that it claims to want to reward. Instead, the tone it adopts towards all farmers reflects the longstanding view of primary producers as inadequate businessmen, incapable of taking advantage of the market, whose sacralisation (Nally, 2014, p.15) has gone side by side with the modernisation of agriculture.

Like previously in the productivist trajectory, farmers are told to adopt new technologies that "promise higher returns by creating added value and by reducing costs" (F2F, p.8) but that only deliver less agency and increased indebtedness when looked at from the perspective of food sovereignty, equity and justice (for example as stated by Van der Ploeg, 2020, p. 593; or Alberdi et al, 2020). Their role as custodians of the landscape and the skills that go with it are overlooked, as farmers are instructed to differentiate their business portfolio and join in the bio-economy.

Reluctant to introduce public policy that addresses issues of power in the supply chain, the Strategy trusts market forces to deliver sustainability, specifically through standards and codes of conduct, which market players are asked to define by and large for themselves on a voluntary basis. Such lack of enthusiasm in addressing the centralisation and power in the supply chain leaves current powerful actors with the upper hand: no redistribution of power is apparent. With regards to seed, agribusiness remains the favoured locus for breeding and their predominance is sanctioned by the penchant of the Commission for biotechnology, which it justifies with a narrative of *complementarity* with other models of farming based on a *win-win* expectation, even though, on account of the intellectual property enclosure it entails, biotechnology is incompatible with both biodiversity management and political agroecology (Montenegro de Wit, 2021, p. 11). Such a weakness in the Strategy has been a vantage point for agribusiness and their political counterparts, at a time when the SARS-CoV-2 pandemic and the war in Ukraine have created easily manipulated disruptions in the mainstream supply chains. Taking advantage of these events and leveraging historical concerns over food scarcity in the European Union, vested interests have mobilised the *food security* discourse together with the complementarity narrative to reassert their power, slowing down any inroads that the Strategy might have made in the direction of sustainability.

As for citizens, the Strategy views them mainly in their role as customers of food products, to which sustainability needs to be promoted through educational activities. By ignoring the political nature of food systems and the role that citizens play in the resistance to regime-backed unsustainable food systems, the Strategy silences in fact the myriad of initiatives that civil society, with the support of local and regional governments, have organised to ensure greater sustainability of the food supply chains, addressing the failures of the regime system, not least during the disruptions that took place in connection with the SARS-CoV-2 pandemic, and whose success has been hailed in both public policy and academia (see for example IPES-Food, 2019 and SAPEA, 2020).

Instead of acting as an integrative leader (SAPEA, 2020, p.87, see also IPES-Food, 2019, p.7) and supporting multilevel governance to stimulate the adaptive, distributed innovation that is essential to sustainability particularly when cultivated diversity is at his heart, the Strategy asserts the role of the EU in setting global standards. Standards though have a drawback in being a tool of the regime, as argued by sociologist Wattnem: they embed the values of those that created them (2016). Standards also tend to favour homogenisation and centralisation, which in the past has worked in favour of established power and against farmers' agency, for example in the case of seed. In consideration of the dynamic nature of biodiversity and the co-created nature of landscapes through the practices of farmers, standardisation remains a particularly negative outcome in farming. Besides, the combination of first mover advantage and enforcement of standards in the context of trade agreements, which the Strategy promotes, has been one of the methods of modern colonialisation (for example with regards to seeds and IPR). A similar outcome with regards to sustainability would be in obvious contrast to the Strategy's claim of a just transition to sustainable food systems and would underpin the continued viability of current international power structures.

### 7.2.2 What narratives and framings are leveraged to define the direction of the transition?

Narratives and framings are used at various levels in the Farm to Fork, and I have discussed some already in conjunction with both the definitions of sustainability and transition, but one narrative is particularly relevant to the direction of the sustainability transition that the Strategy is aiming for.

On its path to economic growth and taking forward the principles of the industrialisation of agriculture, the Strategy continues to promote technological solutions to agricultural problems and embraces what Lajoie-O'Malley and colleagues have called "agri-food tech solutionism" (2020, p.2). This approach, common with regime institutions overestimates the "agricultural viability and feasibility" (ibid) of technologies, while downplaying their negative effects at the social and environmental level. Framing technology as neutral instead of recognising its political nature as an artefact (see i.e. Winner, 1980), the Farm to Fork asks farmers, whose agency and competence it negates, to adopt whatever technological innovation may be available, from mimicking nature to space technology (F2F, p. 8, p.16), in the hope of reducing GHG emissions while maintaining intensive production as usual. In so doing, it treats farming as any other business, something that can only be done by suppressing the epistemic question of "what it means to be a farmer and what it means to farm" (Montenegro de Wit, 2020, p. 2), a question that acquires particular relevance in the context of cultivated diversity where farming means working with biodiversity.

As for seeds, as they are not interpreted from a cultivated diversity perspective, they are seen as any other farming input, the prerogative of the seed industry, which is keen on new breeding techniques, the latest evolution of genetic modification, and the power that can be derived from them. With its technological innovation focus, the Strategy spends more words on the sustainability potential of biotechnology than seed diversity, downplaying the seed sovereignty and environmental concerns that have been widely documented in the literature on the political economy of seeds (notably Kloppenburg) and advocated by the niche-regime of biodiversity-supporting agriculture.

### 7.2.3 What impact does the relationship between discourse and practices advocated by the Strategy have on the transition?

Throughout this document I have discussed and exemplified how discourse and practices can be co-opted, either by appropriating the language and keeping it on a theoretical level that is disconnected from practice or by depoliticizing the practices through selective adoption to fit an agenda.

The Farm to Fork Strategy adopts the language of sustainability transitions but it fails to define sustainability. In its adoption of the *three-pillars approach*, it implies however that sustainability can be achieved - at the very best - as the minimum common denominator of economic, social and environmental outcomes and - at the very worst - subordinating the social and environmental outcomes to economic growth. Neither of these options would lead to transitional change. The practices that are offered as sustainability solutions are still deeply rooted in the productivist paradigm and technology-focussed, aiming as they are at the sustainable intensification of agriculture. This is bound to keep yielding the unsustainable results that agriculture within the same paradigm has previously yielded.

Practices mentioned in the Strategy that could have indicated a move towards transformational change because the ethics in which they originate has sustainability at its heart, such as agroecology and organic, are in reality only adopted selectively to fit the agenda of sustainable intensification and economic growth. For example, organic farming, for which the Strategy sets a binding target, appears to be embraced only in so far as - through labelling standards - it can fetch a premium and thus provides economic benefits to farmers and little connection is made to the ethical approach to farming organically, with the socio-ecological benefits that can be derived from it. Carbon farming, also introduced as a new and sustainable business model, is only discussed as a

tool for the reduction of emissions that can provide new income for farmers, as is participating in the bio-economy by installing anaerobic digesters or operating bio-refineries on farm.

## 7.3 CONCLUSIONS

From analysing the text of the Farm to Fork I came to the conclusion that, despite using the language of transitions, the Strategy does not actually push for transformational change in farming, rather a trajectory adjustment in the direction of reducing environmental impact (in particular GHG emissions) by using technologies that help efficiency and minimise the use of inputs, or precision agriculture, coupled with participation in the bio-economy (by installing a digester or operating a bio-refinery on farm) to deal with any outputs. The linear model of industrialised agriculture does not appear to be expected to change.

However, I have also observed, by comparing and contrasting the Farm to Fork and Biodiversity Strategies, and taking into account the feedback the European Parliament provided in its own Initiative Response, that the picture is more complex. The Biodiversity Strategy, in fact, focuses on agroecology as a sustainable way of farming, takes better consideration of the role of farmers and devotes more space to seeds, which the Initiative Report considers even further in the context of the cultivated diversity perspective, despite both documents being otherwise rooted in the regime paradigms of economic growth and technologically-focussed intensification of agriculture.

It would appear from this conflicting picture that the boundaries between niche-regime and the regime proper are increasingly fluid, as the niche-regimes grows and anchors at different levels and within different institutions. Elzen and colleagues (2012) suggest that some individuals and forums, among which we may count the two Strategies combined, have hybrid approaches, upholding both regime and niche values and practices. However, when practices are adopted separately from the ethics that originated them, the chance of co-option is high, so that optimism can only be qualified. Even as one aspect of innovation is co-opted, writes Van der Ploeg, spaces for resistance and negotiation have been opened which are likely to have inspired others to follow suit. Such spaces for negotiation have been taken advantage of, for example, by the European Coordination Let's Liberate Diversity. EC-LLD is taking advocacy for cultivated diversity further, from the new ground gained through anchoring in at least two EU institutions: the new organic regulation and the Farm to Fork and Biodiversity Strategies, aiming to take advantage from any opportunities arising from the international commitments that the EU has taken at the UN level with the CBD and ITPGRFA.

I have also looked at the Strategies within the wider context of advocacy, policy and politics and observed that - at the global level - there is increasing recognition that agroecological farming can help tackle the combined challenges of climate change and biodiversity loss, and that discourses about sustainable farming and biodiversity-supporting agriculture are starting to converge around agroecology. Advocacy for political agroecology is gaining momentum, in academia and the sustainable development circles around the UN; these are joining the niche-regime of biodiversity-supporting agriculture, providing insights for effective transformational policies that take into account the power embedded in regime structures and narratives. While powerful interests in the regime, particularly within industrial agriculture and the biotechnology giants, are rallying around more general populistic trends that are exploiting farmers' frustrations with their unfavourable position in the market, there are signs that the power structures in the regime may be weakening. For example, the food security narrative, even as it can wield power with the regime, has been challenged at some level by the Farm to Fork Strategy itself, so much so that regime actors used it

*against* the Strategy with some success. And even though the Farm to Fork Strategy was strongly opposed by the US for fear of its impacts on trade, the recent press release that the US too is attempting to make farming more sustainable, credits the Farm to Fork Strategy, even in its own weaknesses, with some influence in the direction of a transformation.

So, in answer to my overarching question: has Farm to Fork Strategy opened a window of opportunity for sustainable, biodiversity-supporting agriculture, must be that it has - at least it has in so far as it provides a new, higher starting point and a better-grounded negotiating space for cultivated diversity to take advocacy forward. That the biodiversity-supporting niche-regime continues to find ways to negotiate and anchor to the regime, positioning itself "favourably in the light of ongoing processes [...] mobilizing support, influencing agendas and re-directing investments and policy commitments" (Darnhofer, 2015, p. 26) will be necessary to induce better outcomes for cultivated diversity.

Transitions are "non-linear processes of social change in which a societal system is structurally transformed" over time and through variable phases from "one dynamic state of equilibrium to another" (Avelino and Rotmans, 2009, pp. 543-544) and even just the institutional embedding of the Farm to Fork Strategy within the EU is complex, because of what Schebesta and Candel refer to as "turf wars", "institutional tensions" and "bickering over mandates" (2020, pp. 587-588). Therefore, further research to support transition management around the Farm to Fork Strategy could investigate the motivations and goals of European institutions, to achieve the "deep understanding of policy regimes" that might exploit their weaknesses in favour of change, what Duncan and colleagues refer to as "a precondition to support policy implementation strategies that can address opponents and inertia" (2022, p.185). The IPES-Food report *Towards a common food policy for the European Union* (2019) is in that sense a precursor, tackling as it does the question "how ambitious food system reforms can be successfully adopted and implemented by the EU in a context of major power imbalances, vested interests, limited public resources, and growing Euroscepticism" (2019, p.11).

As the Farm to Fork Strategy is just an agenda-setting exercise, and several other policy streams coalesce around its objective and targets, a positive outcome for a transition, in fact *transitions* (plural), will depend on how these streams develop and whether there is "integrative leadership" to facilitate their multilevel governance "facilitating inter- and intra-institutional cooperation" (2020, p.87), as argued in the SAPEA Report (2020), and coordination of what actions the Member States are going to take, as suggested by Schebesta and Candel (2020, p. 588), while enabling adaptive solutions that work at the local and regional level to support biodiversity, of both seed and landscapes.

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