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The Transformation Flower Approach for Leveraging Change towards Multiple Value Creation and Institutional Change

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Abstract: We introduce the Transformation Flower Approach (TFA), a Theory of Change that attends to multiple value creation and institutional change as a dual design challenge. We highlight how the TFA integrates social scientific theories and models relevant for transformative change (in particular focusing on pathways, leverage points, governance, power, and values) and demonstrate its practical value by an application to the ongoing transformation of the Dutch food system. By providing a holistic, transdisciplinary and practically relevant approach that aims to support new social contract formation, the TFA goes beyond other transformative change approaches. Based on the notion of pathways, it offers a toolbox that aids in working towards desired futures, involving both incumbents and challengers in an effort to harness untapped yet proximal potentials in a forward-looking way. By embracing an innovation approach, it not only promises to circumvent resistance to change, but also serves as a step-by-step approach to identify options for multiple value creation and effective cooperation. We demonstrate the analytical and practical value of the TFA by discussing action perspectives at various levels and scales in the context of the Dutch food system transition, including (1) area-oriented approaches, (2) acceleration agendas for specific transformation pathways, and (3) actor-specific transformation flowers. In developing these, we emphasize the importance of interdependencies between leverage points. Our approach helps to identify opportunities to link transformative options (the what), actors (the who) and levers (the how) in dynamic interaction to embark on transformative pathways.

Keywords: transformation flower approach; transformative governance; co-evolutionary governance; power; values; multiple value creation; institutional change; stakeholder analysis; power mapping; leverage points; justice; equity; sustainability; natural social contract; eco-social contract; food system transitions; IPBES transformative change assessment

1. Introduction

Governments around the world have committed themselves to supporting the transformation towards more sustainable societies, endorsing transformative goals such as responsible consumption and production, the eradication of poverty, and clean and affordable energy for all (see https://sdgs.un.org/goals). While transformations have also occurred in the past, the urgency associated with current social-ecological transformations is unprecedented. Here, we develop a novel transformation approach that both conceptualizes and nurtures transformative change through attention to multiple value creation and institutional change.

Our main argument is that transformative change towards sustainability (for instance, in the energy or food system and in making the economy more regenerative and fair) needs a society-wide approach. Importantly, realizing transformative change requires new Natural Social Contracts or Eco-Social Contracts (Huntjens, 2021; Huntjens and Kemp, 2022; UNRISD, 2022; Gough, 2022; Bogert et al. 2022; Kempf & Hujo, 2022; Krause et al. 2022). We define Natural Social Contracts or Eco-Social Contracts as the collective power of societies, people and nature for dealing with the polycrisis of the 21st century (including deepening inequalities and ecological crises) through collective agreements

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(at multiple governance levels) among members of a society to cooperate with one another and abide by certain rules or norms targeted at sustainability, equity and justice, with the associated rights and duties of care for the environment and the well-being of others (including future generations and all life on this planet). This involves adopting a different worldview (eco-centric or Earth-centric instead of anthropocentric), a different view of humanity (homo ecologicus/florens instead of homo economicus), and different economies and cultures (regenerative/post-growth/wellbeing economies and cultures instead of linear ones). Social contracts are different in each country and context; but essentially, they comprise the web of relationships that bind together disparate citizens, communities, institutions and governments into a just and sustainable society (Mohamed and Huntjens, 2023). Reimagining social contracts requires a reconfiguration of not only the overarching goal of a social contract, but also a fundamental restructuring of how humanity views itself and its relationship with nature (Mohammed & Huntjens, 2023). Given that 'current' social contracts, with their emphasis on economic growth, extractivism, human domination, global markets etc., are strongly associated with the current planetary crises, the development of new social contracts is urgently needed.

Table 1 provides an overview of the key characteristics of the underlying paradigm shift and transformation from current to new Natural or Eco-Social Contracts. This new discourse is nurtured and disseminated in the Global Research and Action Network for a New Eco-Social Contract established in 2021, coordinated by the United Nations Research Institute for Social Development (UNRISD) and the Green Economy Coalition (GEC), and with more than 350 participating organizations joining in the first two years. The network reflects the plurality of perspectives that are part of the ongoing visioning and implementation processes for new social contracts at various levels and different contexts.

Table 1. From current to new Natural or Eco-Social Contracts, including new economies and cultures (Adapted from Huntjens (2021), Huntjens & Kemp (2022) & Mohamed & Huntjens (2023).

Key Characteristics	Current social contracts	Natural or Eco-Social Contracts
Overarching goal of the social contract	From the protection (for example, of property rights) and maintenance of social order and individual freedom	To broad well-being, social and environmental justice, and planetary health
Resource management regimes	Command & control regime, with a tendency to categorize, rank, measure, simplify, and manage	Adaptive and integrated regimes: flexible in order to deal with complexities, uncertainties and surprise
Economic development paradigm	Neoclassical and neoliberal economics that privilege human well-being (anthropocentrism), with severe discounting of the environment	Economies in the service of all life: economies that support broad prosperity within the ecological limits of the planet and allows nature—oceans, soils, rivers, forests, plants, animals—and people to thrive together
Worldview	From anthropocentric visions of life where people work to earn money and consume	To eco-centric visions where people are part of an interdependent ecosystem and work for prosperity within planetary limits
Vision of human behaviour	From *Homo Economicus*, a rational person pursuing wealth and self-interest	To *Homo Ecologicus/Florens*, a person connected with and caring for the well-being of all life on Earth
Basis for social relations	From a utilitarian vision of the social and human–environment relationship	To mutual respect, solidarity, togetherness and social and environmental stewardship
Vision of society	From an individualistic view of society	To a view where humans are one part of a social–ecological system
View of nature	From a position where nature is used and exploited exclusively by humans to serve the needs of humanity	To seeing the Earth holistically where humans are a subservient (but impactful) part of the planetary ecosystem

The transformation to new social contracts appears an Herculean task, since any transformation is up to formidable barriers: i) no actor has the overview and power to do this, ii) transformative change entails the deliberate decline of certain arrangements and hence comes with disadvantages and costs for important actors, some of which will actively resist it (Rosenbloom and Rinscheid, 2020), iii) transformations are values-laden and entail conflict about the legitimacy of technologies, policies and practices (Geels and Verhees, 2011), iv) new system practices are not born perfect and their diffusion depends on their improvement and changes in the socio-economic context.

Due to lock-in effects along various dimensions (behavioral, technological, institutional; see Seto et al. 2016), most actors cannot change currently unsustainable practices, beliefs and dispositions as acts of free will (Kemp and van Lente, 2023). However, they can be enrolled in processes of transformative change if the outcomes of such processes are attractive for them. Making the outcomes attractive is a key challenge for transformative governance and requires the availability of different pathways to give actors a choice. In this paper, we will outline how the transformation flower approach and its focus on projected futures, visions of multiple value creation and required institutions, all of which are subject to change, can contribute to achieving transformative change. We develop our approach to support the formulation of acceleration agendas for context-specific transition pathways as well as society-wide transformations. We therefore aim to provide an answer to the following core question: How can positive transformative change be achieved through a society-wide transformation approach?

To demonstrate how our approach can be fruitfully applied, we use the case of the Dutch food system transformation. We chose this case due to our involvement in the National Research Program Transition to a Sustainable Food System (NWA-TDV) in the Netherlands, in particular focusing on the governance of food system transformation. We will thereby illustrate how our phase model, the TFA, may be used along four phases of enacting transformative change (described in section 4), drawing on theoretical building blocks that will be described in section 2.

To provide some context for our empirical illustration, critical reviews of the agri-food system (e.g. NewForesight and Commonland 2017; Godfray et al. 2010; SAPEA 2020, Huntjens, 2021, Aarts and Leeuwis, 2023) speak to the need for fundamental change, or a transformation, to a sustainable, healthy and just system. The current system is characterized by a dominant focus on production and efficiency, producing as much food per square meter as possible at the lowest possible cost for the producer, thereby compromising sustainability, justice and healthfulness. Moreover, value creation is limited to financial profit maximization and cost driven development (Huntjens, 2021). Technology (e.g. pesticides and artificial fertilizer) is used to make natural 'production factors' (i.e. water, soil, plants and animals) manageable in order to match a low cost price within an international competitive trade model. The predominant focus on productivity and profit maximization in 'free markets' has shifted social and ecological values along with justice concerns to the background (Huntjens, 2021). Profit is narrowly defined in monetary terms by externalizing ecological and social costs for humans and non-humans, which means these 'hidden costs' are usually not reflected in the price of food (*ibid*). A recent estimate puts the 'hidden costs' of global food and land-use systems at $12 trillion, which is 20% more than its market value of $10 trillion (Pharo et al. 2019). These figures only deal with production, but exclude the suffering endured by animals in animal agriculture, or the costs related to unsustainable and unhealthy food environments and consumption, the disconnection between industrial farmers and food consumers, and other social-economic costs.

Two broad trajectories have been established for limiting the negative effects of current agricultural production systems. The first one is based on agroecology, organic farming and local resourcing. This movement is linked with alternative conceptions of the economy (Vivero-Pol, 2017). The second is primarily based on technological fixes based on the premise of 'sustainable intensification'. We do not take sides in the sense of advocating for any of these models. In our view, a crucial challenge is to provide farmers with the resources required to ensure that agricultural production will benefit society and the natural environment (potentially in multiple ways), while terminating practices that may be profitable in the short term but are clearly detrimental from a socio-ecological and long-term perspective. As we will explain, this requires cross-sectoral, long-term

oriented and transdisciplinary governance and collaboration that allow for continuous learning and reflection. It requires interactive processes that bring together different actors, interests and perspectives, allow for shared problem definitions and narratives of change, and identify joint intervention strategies and an instituted process that deals with resistance and the accommodation of interests.

2. Transformative Change: Conceptual Building Blocks from the Social Sciences

2.1. Transformations and Governance

In the literature on sustainability transition and socio-ecological transformation, various steering approaches have been proposed. To varying degrees, these provide inspiration for the development of the TFA introduced in more detail in section 4. A particularly prominent approach is transition management, used in the Netherlands as a governance approach for system innovation. Transition management seeks to enroll business in a process of change towards more environmentally sustainable systems that require collective actions and programmes for achieving this (Kemp et al. 2007, Rotmans and Loorbach, 2010). The steering philosophy is *guided evolution*, taking the form of active support for transition paths and transition experiments and selection pressures on unsustainable technologies. Transition management is based on the notion that persistent problems require fundamental changes in societal subsystems, which are best worked towards in a forward-looking and adaptive manner, based on multiple pathways to more ecologically sound systems of production and consumption (Kemp, 2010). Transition management shares several elements with the literatures on technological innovation systems (Bergek et al. 2008) and sustainable market transformation (Nijhof et al., 2022; see Table 2), such as the emphasis on evolutionary change and an appreciation of the behavior of complex adaptive systems. It goes beyond these approaches, however, in its strong focus on governance interventions and modulation of the interplay of innovation and societal change.

Transition management continues to receive a lot of attention in academia and practice. It has been praised for focusing on the transformation of systems of production and the attention to pathways (Meadowcroft, 2009). Criticisms have been raised with respect to (1) its rather functionalist and technocratic character and the inherent democratic deficit (Hendriks, 2008), (2) the fact that the state is typically portrayed as a progressive and collaborative "facilitator-stimulator-controller-director" of the transition management process (Lawhon and Murphy, 2011), (3) a rather tenuous articulation of how socio-technical change is interacting with economic structures, cultural change and changing state-business-civil society relations (Feola, 2020; Kemp et al., 2020), (4) the missing attention to ecological gains and distributional consequences (for instance in developing countries; Wigboldus et al. 2021), and (5) the weak grasp on the politics of societal learning and the contextual embedding of policy design (Voss et al. 2009; Meadowcroft, 2011).

One overarching criticism of transition management is that the politics of complex system change are sidelined due to the over-emphasis on the problem-solving element of governance. Accordingly, transition management tends to neglect that powerful actors are able to mobilise societal support against interventions aimed at system change (Aarts & Leeuwis, 2023). A necessary condition for achieving system change is thus to attenuate the agency of actors resistant to ecologically desirable changes – be it by winning their support, changing institutional rules, or making them accept changes in regulations or market rules. As foreshadowed in the last column of Table 2 and developed further below, we explicitly address this issue in our TFA, which aims at making transformative changes desirable and feasible for the beneficiaries of the current system, with a view on enhancing their capacity for change. With due attention to joint values and principles such as responsibility, resilience and ecological effectiveness and sensitivity to concerns about a 'just transition', different actors can be enrolled into processes of change.

Importantly, in contrast to other transformative approaches, our approach de-emphasizes forced change. Instead, it conceives change as involving multiple pathways. It thereby takes up insights from the Small Wins approach (Termeer and Dewulf, 2019), which emphasizes the merits of

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incremental changes. Incrementalism may not only avoid resistance, procrastination and competition, but also lead to transformation via an accumulation of potentially non-linear shifts.

Achieving transformative change also requires addressing the underlying paradigms, values, worldviews and principles (of current and future desirable systems) as indirect systems drivers (Huntjens, 2021; Huntjens and Kemp, 2022). Addressing these drivers is challenging because changes in worldviews and values are typically slow and protracted processes. Transformative governance theory (Visseren-Hamakers et al., 2021) offers five principles that are helpful for confronting these drivers: (1) building governance mixes that address cross-cutting challenges in an integrative way (across sectors, governance levels and places); (2) empowerment of weaker and marginalized voices; (3) adaptive decision-making (to harness feedback and recalibrate if necessary); (4) recognition of different knowledge systems and supporting the inclusion of sustainable and equitable values by focusing on types of knowledge that are currently underrepresented; and (5) application of the precautionary principle when governing for uncertain future developments, especially the development or use of new technologies (Visseren-Hamakers and Kok, 2022; Visseren-Hamakers et al., 2021). We endorse these principles of transformative governance theory and build on them in the development of the transformation flower methodology.

Table 2. Overview of transformative change approaches (by authors).

	Transition Management	Innovation Systems	Sustainable Market Transformation	Small Wins Approach	Socio-ecological systems research	Transformative governance	Transformation Flower Approach
Key publications	Kemp et al., 2007; Rotmans and Loorbach, 2010	Bergek et al. 2008; Planko et al., 2016; Leeuwis & Aarts, 2011	Nijhof et al., 2022	Termeer and Dewulf, 2019	Olsson et al., 2014, Westley et al., 2013	Visseren-Hamakers and Kok, 2022; Visseren-Hamakers et al., 2021	Huntjens, 2021; Huntjens & Kemp, 2022; and this publication: Huntjens et al., 2023
Core question(s)	How can transitions be influenced through collective action aimed at innovation, mobilization of actors and co-evolution?	What does it take for (technological or social) innovations to succeed? How do innovations affect the dynamics of societal transitions?	How does a sector become more sustainable? What are the dynamics and stages of the change process? What does it require of the various actors that are part of this process?	Which interventions can be used to reinforce, accelerate and deepen a change process?	How can ecosystem resilience be achieved through social action?	How can transformative change be governed?	How to identify and mobilize systemic leverage points to enact transformations? How to harness interdependencies between leverage points and agents? What are the conditions for establishing a Natural Social Contract?
Theoretical foundations	Governance theories, Evolutionary theory, Complexity theory, Post-normal science, Postmodernism, Integrated assessment, transdisciplinarity	Innovation sciences, Evolutionary innovation theory	Systems theory, Evolutionary economics	Organizational science (in particular change management), Political science (in particular incrementalism)	Ecological system theory, Complexity theory	Political science, Environmental governance	Complex adaptive systems, Political science (in particular conflict resolution and cooperation), Evolutionary governance theory
Theory of change	Transformative innovations arise from social counter-movement, entrepreneurship, curiosity or idealism. These processes share that they are trying to change, disrupt or replace existing dominant regimes. Patterns of degradation, conversion and dismantling of existing systems as an additional driver of change. Knowledge development (action research, co-creation in and with practice) as a driver of change	The TIS-model focuses on the functioning of the technological innovation system as the locus of change (i.e., which key processes or functions may or may not take place); not the structure (i.e., the build-up of the system)	Innovation arises within and between systems (not outside the dominant system). Collective behavior is influenced by existing incentives. If incentives change, the outcome changes. There is a predictable order in how niches and pressure from the landscape change the dominant regime.	Small wins can be achieved via (non-linear) socio-psychological mechanisms, (e.g. bandwagon effects, logic of attraction) and through dissemination, broadening and deepening that accumulate to system change. System change is seen as emerging from incrementalism; i.e., small political steps ultimately lead to system changes and are therefore more transformative than fundamental policy shifts, as the latter lead to resistance, procrastination and competition.	Innovation, adaptation, and transformation are viewed as ongoing requirements of resilient socio-ecological systems. Leverage points (Meadows 1999) play a crucial role in bringing about change in systems.	Transformative change can be governed by focusing on the indirect drivers and implementing the following governance approaches in conjunction: integrative, inclusive, adaptive, transdisciplinary and anticipatory governance. Coalitions of the willing together strategize what instruments or initiatives are needed when and where to accelerate transformations.	Transformative change is context-specific, path dependent and goal dependent, taking place at multiple levels through penta-helix models of innovation. Achieving transformative change requires co-evolution between discourses, actors and institutions. Transformations cannot be controlled or planned, but their speed and direction can be effectively influenced. Governance requires fine-tuning of top-down policy and visions with bottom-up approaches. As such, transformative change often occurs in hybrid form: it is quasi-planned AND occurs spontaneously.

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2.2. Dealing with Power

To identify leverage points for transformation pathways, it is vital to engage with the *politics* of transformations (Meadowcroft 2011); notably: what interests are at stake, how is political power distributed in a society and how is it exercised, what changes in power relations are needed to enable transformations and how can those be enabled, and what may coalitions for transformative change look like?

Questions of politics and power are a central theme of social science analyses of systems stability and change and have also received some attention in food systems transformation research (Clapp and Fuchs 2009; Cohen and Ilieva 2015; Hinrichs 2014; Karlsson et al. 2018). Given that politics—the activities and (often conflictual) processes surrounding the adoption or rejection of policy—are ultimately the result of power relations, we focus particularly on power. Rather than providing a comprehensive review of conceptualizations, we focus on established approaches to power that can be mobilized fruitfully in the context of our ambition.

According to Dahl (1957, p. 202), power is the capacity to make others do something they would not otherwise have done. This understanding, which is open to a variety of ways in which this capacity translates into outcomes (e.g., through coercion or persuasion), can be helpful in analyzing politics in situations of open contestation. But often, power plays out more subtly. For instance, powerful actors might exploit power asymmetries to prevent issues or solutions from appearing on the political agenda (Bachrach and Baratz 1962; Schattschneider 1960), and less powerful actors might choose not to participate in political struggles given their weak position (Pierson 2016). Power also entails ideational dimensions, manifested through the use of language and semiotics to sway the perceptions, cognitions and preferences of other actors (Lukes 2005, p. 28). Power, hence, becomes apparent in discursive interactions, in which actors strategically represent problems and possibilities in such a way that they shape decisions about future states perceived as viable and desirable (Levy and Egan 1998; Rosenbloom 2018; Smith et al. 2005). Seen in this light, power in food system transformations is closely interlinked with the ability to convince others of alternative visions of desirable future states of the system and its role in society.

A fundamental problem for steering societal processes is that those who are in charge of the steering wheel are at the same time part of systems they wish to steer. Dialogic webs, which have become an important governance mechanism since the 1980s, have been shown to be preferred by most economic actors across sectors, as they open opportunities for businesses to exercise ideational and persuasive power (Braithwaite and Drahos 2000). At the same time, such dialogic webs also provide potentially untapped opportunities for less powerful actors to work towards shifts both in dominant conceptualizations of problems and societal values and norms more broadly, if they succeed in the creation of "shared meanings and collective identities" (Fligstein and McAdam 2012, p. 46). Based on the webs of influence approach, Gunningham (2019), for instance, examines the effects of environmental activists on climate change governance. Despite being confronted with massive power imbalances and collective action problems, environmental movements or even single activists can become influential catalysts for transformation if they succeed in forming and navigating (e.g. when deciding which allies to invite when and where) webs of influence with a diverse range of actors, some of which are endowed with 'hard' power resources. When it comes to the food system, this means that even under conditions of massive power asymmetries between actors, change agents may be able to trigger cascades of transformative change as part of broader webs of influence.

2.3. Leverage Points

In order to propose powerful interventions that can transform deep-seated properties, behaviors and outcomes of systems of production and consumption, the identification of leverage points is a crucial analytical step. Leverage points are 'places within a complex system […] where a small shift in one thing can produce big changes in everything' (Meadows, 1999, p. 1). This idea of leverage points is very appealing to external decision makers, but begs a diagnostic analysis and leverage point actions that are agreed upon and implemented. Application of the leverage points concept

allows for a scientific unraveling of system complexity, which is needed to address root causes of unsustainable food systems.

An insightful visualization for identifying system leverage points has been constructed by Maani and Cavana (2007), building on the iceberg analogy of complex systems that consist of different levels (Meadows, 2008). It suggests that the most powerful transformative interventions are targeted at the deeper levels of the food system iceberg, in particular the mental models at the bottom that capture broader societal values, principles, assumptions and beliefs that shape our systems. Importantly, leverage points for food system transformation may be located in other systems often not accounted for when studying agri-food systems, such as the financial or energy sector, or in society-wide factors, such as the organization of our global economy. These cross-sector interactions highlight that transformative governance requires an integrative approach (Huntjens et al., 2012; Visseren-Hamakers and Kok, 2022). The TFA, which we introduce in section 4, incorporates the identification of leverage points as one of its key steps to analyze and propose transformative interventions for sustainable food systems. Our approach extends the model of Meadows (1997) in giving attention to bottlenecks and signals for distinctive pathways. Bottlenecks are "forces that sit between other phenomena and may gatekeep potential change" and signals are "highly connected elements" that serve as "lead measures for changes happening less visibly/more slowly elsewhere in the system" (Murphy, 2022, p. 10). We view mental models and paradigm shifts as strongly dependent on other changes (such as attractive transactions for the actors concerned) and avoid pitfalls of idealism, reductionism and pure pragmatism.

2.4. Values for Transformative Change

While the role of values has been widely acknowledged as potential drivers of transformative change (Horlings 2015), sustainability scientists have not yet put values at the center of scholarly attention (Miller et al. 2014). In psychological research, values are conceptualised as standards or principles that motivate and guide people's judgments, decisions and behaviours. People's judgments about good or bad, worth striving for or avoiding, justified or illegitimate depend on the values they prioritise (Schwartz 1992). The weight individuals assign to certain values (e.g., biospheric values like respecting the earth) determines the extent to which they develop specific beliefs about valued objects or beings and environmental norms, which in turn, if activated, shape environmentally relevant behaviours (Harland et al. 1999; Schwartz 1977). The fact that individuals differ in the ways in which they resolve trade-offs between different values helps to explain divergence in human behaviours (Schwartz 1992).

While psychological research focuses on *individual* human beings as "value holders", research in cognitive anthropology and organisational studies examines values at the level of social groups, in particular *organisations*. Along these lines, values not only capture individual cognitive structures but also "collective social structures" (d'Andrade 2008). This distinction is highly relevant, as transformations involve the decisions of numerous organisational actors representing different backgrounds and interests. In the food system, for instance, the unsustainable system of food provision and consumption is upheld by dominant value orientations not only among individuals but also among many organisational actors that legitimize a focus on maximum production, efficiency, competition, market-driven allocation, and commodification of nature and animals. We argue that understanding the potential role of values in driving transformative change requires a sense of the interplay of personal and organisational values (Finegan 2000; Vandenberghe and Peiro 1999) and system values (McGreevy et al. 2022), with a particular focus on identifying the political and institutional factors that shape organisational or system values and on creating contexts conducive to activating transformative values.

The environmental values literature highlights that while analysing the prevalence of broad values among actors is important, understanding how certain contexts condition the activation of values in specific situations and their manifestation as more specific beliefs and norms may be even more relevant, especially when it comes to assessing the importance of values in driving system transformation (Horlings 2015; Tadaki et al. 2017; Te Velde et al. 2002). For instance, in a context

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where vegan food is cheap and superior in taste and texture to non-vegan alternatives, and plant-based lifestyles are promoted in an appealing way by celebrities or through other social institutions, individuals with strong hedonic value dispositions may engage in pro-environmental behaviour (a vegan diet) precisely because conditions make such a decision pleasurable and convenient (Miller et al. 2014; Steg 2016). Absent such conditions, pro-vegan beliefs and norms are much less likely to be developed by the same individuals. Hence, values cannot be separated from the environment and social processes in which they become activated and possibly also reshaped. Values are dynamic and often constrained by or traded off against one another or other drivers of behavior depending on context (Davis et al. 2023, in press).

Behavioural change thus depends on attractive practices (which are doable, affordable and attractive to the actors concerned), which in turn depend on coordinated actions to create those and changes in the (political and socio-economic) landscape. Along these lines, the principle of circularity and basic forms of animal well-being developed from nice but nonbinding aspirations to widespread norms, putting pressure on those not adhering to them yet. These developments may cause governments to set minimal standards and upgrade these over time. Latent values may thus become manifest values through alternative practices and institutions. This example also highlights that values and principles are interrelated with business practices and logics, policy and politics. Going one step further, we believe that an approach focusing on *multiple value creation*, a concept that understands values as an outcome of economic processes, holds great value for achieving change and effective cooperation (Miller et al. 2014). For instance, if farmers engage in the provision of ecosystem services (because they get paid for this), they not only diversify the range of socio-economic values they generate, but likely also shift their prioritization of ecosystem services in terms of values-as-standards and, in addition, may influence others to do the same. Farmers may also engage in energy production and tourism, as alternative sources of income, and be helped by government and other stakeholders to achieve this. Attention to multiple value creation helps to break the gridlock of efficiency via scale-economies.

Value change is an emergent outcome of transformations. Accepting responsibility for nature regeneration and lowering the environmental footprint of one's actions depends on attractive ways to do so, which in turn depend on collective action and changes in incentives. Finding a common value base among actors and the use of attractive imaginaries for innovation and development may offer opportunities to steer a system into the desired direction. The IPBES Values Assessment Report (2022) finds that there are a number of broadly shared values that can be aligned with sustainability, emphasizing principles like unity, responsibility, stewardship, and justice towards other people, non-human animals and other parts of nature. According to the report, four values-centered leverage points can help create the conditions for transformative change towards more sustainable and just futures: (1) Recognizing the diverse values of nature; (2) Embedding valuation into decision-making; (3) Reforming policies and regulations to internalize nature's values; (4) Shifting underlying societal norms and goals to align with global sustainability and justice objectives.

3. State-Based Attempts at Achieving Transitions in The Netherlands

In the Netherlands, a transition towards a modern agricultural system has been achieved in the 20th century. After World War II and a traumatic famine in 1945, the Dutch policy focused on increasing productivity via dedicated agricultural research, knowledge transfer, and land redistribution to enable concentration and specialization. Moreover, changes in water management were adopted to increase the carrying capacity required by increasing cattle density and the use of machinery (Grin et al. 2004). Machinery and increasing pesticide use were part of these developments. Several thousands of academic professionals became involved in modernizing the Dutch agricultural system, and an "iron triangle" consisting of agricultural specialists in parliament, the Ministry of Agriculture and agricultural branch organisations dominated policy-making (Grin et al. 2004).

The negative effects of these developments, such as increasing environmental degradation and dependence on one-sided and hence vulnerable business models, were barely anticipated and dealt

with. This is a well-known side effect of state-initiated episodes of social engineering (Scott 1998). The negative side effects of the modernization of Dutch agriculture provide the empirical context in which we apply our novel transformative change approach. In developing this approach, we gained some inspiration from the experiences made with transition management for sustainable energy in the Netherlands between 2002 and 2008. Based on suggestions from seven "transition platforms" working on different dimensions of the energy transition, a broad portfolio of options was proposed and supported in the context of the energy transition management program. Driven by modern innovation systems thinking, and taking into account the complexity of the energy system, transition management policies were concerned with (1) managing interfaces, (2) organizing (innovation) systems, (3) providing a platform for learning and experimenting, (4) providing an infrastructure for strategic intelligence, and (5) stimulating demand articulation, strategy and vision development (Smits and Kuhlman, 2004). While transition management has helped to increase the share of renewable energies in the Dutch energy system, it has not (yet) led to a comprehensive transformation of the energy system.

Similar to the energy transition management program, we opt for an innovation-oriented approach guided by transformative goals, pathways and experiments. However, our approach goes beyond this experience in various respects. First, we start from a somewhat less idealistic conception of the roles of governance and policy. In the energy transition, despite high hopes, the policy instruments applied lacked synergy, coherence and congruence (Howlett and Kern, 2009). This is due to the fact that policy choices were ultimately strongly shaped by existing interests, ideas and institutional path dependencies, and less so by well-designed, seemingly rational conceptions of the transition (Howlett and Kern, 2009). With our transformative approach, we anticipate the politics of transformations and account for resistance to change among incumbents by attending more closely to opportunities for incumbents, such as multiple value creation, and by more strongly working towards decreasing the attractiveness of established practices. Second, we offer a more detailed engagement with the notion of pathways at different scales and levels, thereby offering space for a diversity of transformative options. In our understanding, multiple transformative pathways are not mutually exclusive but may be combined and coexist. We assume that each transformative pathway requires a dedicated and collectively determined (as opposed to top-down introduced) governance approach. And third, we incorporate insights from system dynamics by paying particular attention to identifying leverage points and designing interventions to activate leverage points with a particularly high potential for transformative change. Our proposed approach thereby also aims at tackling systemic causes of unsustainability that often go unaddressed. These causes go beyond supermarket prices and resistant farmers, in giving attention to institutions (such as ownership rights), sites of transactions (such as world markets) and mental models (such as "we feed the world") that are perpetuated by the current economic system.

There is widespread agreement in the Netherlands that the agri-food-sector should become more regenerative, circular, more animal-friendly and should impose less health risks to animals and humans, in ways that do not jeopardize the income of farmers. The predominant focus of policy is on reducing nitrogen emissions from intensive farming, via manure treatment and a strengthened role for biological agriculture. The progress that has been achieved so far, however, is by no means sufficient and does not question the deeper structures of the Dutch agri-food system. In 2021, the Dutch Administrative Court of the Council of State, the highest administrative body in the Netherlands, ruled that the Dutch Government's Nitrogen Action Program to limit the effects of nitrogen was insufficient for safeguarding the quality of nature (as required by the EU Habitat Directive). Because of this, newly provided permits for farming were now illegal and every new endeavour had to prove that it did not have adverse effects on nature preserve areas, many of which were located in the vicinity of farms. Ever since, the sector has been in crisis. Attempts to take corrective action by the government met with fierce opposition from farmers involved in intensive husbandry. Organic farming is upheld as a model by the government, but only a relatively small share of farmers prefers to transition to this model. In various provinces, area-based approaches are being pioneered based on short supply chains, circularity and payments for ecosystem services

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involving organic and non-organic farmers. Those policies have a more forward-looking element, but are also rather narrow in that opportunities for agrotourism and energy generation are not part of them (some do). This points to the need for a transformation-oriented approach that goes beyond the promotion of agro-ecology and organic farming and looks beyond family-based forms of agriculture. We propose that the predominant approach of dealing with problems one-by-one and by using non-disruptive measures – which shares similarities with the science of 'muddling through" (Lindblom, 1959) – should be replaced by a transformative approach that confronts multiple problems in an integrative, transdisciplinary and forward-looking way.

4. The Transformation Flower Approach

The Transformation Flower Approach (TFA) offers an analytical device for researchers and a hands-on tool for practitioners. It is a society-wide transformation approach to support the development of collective agreements and acceleration agendas (at multiple governance levels) targeted at a sustainable, equitable and just society. It serves the purpose of creating new social contracts with a more important role for duties of care and responsibility (Huntjens and Kemp, 2022). In the literature, these are referred to as a Natural Social Contracts (Huntjens, 2021; Huntjens and Kemp, 2022; Huntjens et al., 2023) or Eco-Social Contracts (Gough, 2022; Kempf and Hujo, 2022; Kempf, Hujo and Ponte, 2022; Krause et al. 2022; UNRISD 2022; Mohamed and Huntjens, 2023). The TFA has been adopted as a theory of change by the IPBES Transformation Change Assessment (2022-2024) for linking options, levers and actors for transformative change/pathways.

A preliminary version of the transformation flower was first published by Huntjens and Kemp (2022). Predecessors and related approaches have been used in environmental governance, diplomacy and mediation processes in various parts of the world, as well as for studying transformation processes and institutional change in water resources management, agriculture, and spatial planning (Wijnen et al., 2012; Huntjens et al. 2014, 2016; Yasuda et al., 2017; 2018; Islam and Madani, 2017; Huntjens, 2017, 2019, 2021). The TFA has been further developed with a view to clarify links to (and differences vis-à-vis) other transformative change approaches (see Table 1). Moreover, based on insights gained during application, the approach has been continuously improved and refined further. In particular, the TFA has been applied in the research project 'Transition to a Sustainable Food System' in the Netherlands (2021-2024, funded by the Dutch Research Agenda, NWA) and in the IPBES Transformative Change Assessment (2022-2024) to develop and substantiate acceleration agendas for specific transformative pathways. This dialogue between theoretical work and application has enabled an ongoing iterative learning process. While the TFA discussed here presents a robust and validated approach, we anticipate further developments in the future.

In Figure 1 we provide an overview on the different dimensions of the TFA, which are translated to phases when using the TFA as a transformative tool. The TFA can hence be used as a step-by-step approach to identify options for transformative change, multiple value creation and effective cooperation through connecting actor coalitions and interdependent systemic leverage points. The starting point of applying the TFA is set by defining context-specific and goal-dependent transformation paths (Huntjens and Kemp, 2022). By giving attention to the recursive relationship between practices and systems, leverage points for transformative change can be identified. From there, the transformation flower can be used as a 'plug and play' tool for individual steps or combinations thereof within the TFA, varying from short-cycle knowledge development (including co-creation and brainstorming sessions, sandpits and Crutzen workshops) to long-term cyclical knowledge development (including multi-year transdisciplinary research in living lab-like settings). A short-cycle trajectory can be part of a medium or long-cycle trajectory. This offers a wide range of possible applications:

- Vision development for a specific area or transformative pathway.
- Identification of leverage points and actors involved, taking into account interdependencies and non-linear feedback loops.
- Organization and steering of collective action & transformation agendas based on (priority) leverage points and including related actors/coalitions.

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- Identification of coupling opportunities, for example nexus solutions for water, climate, energy, food, nature and health.
- Collective system analysis or systemic co-design, for example focusing on value orientations, coherence between system interventions and options for multiple value creation.
- Political-economic analysis and understanding of power dynamics in order to inform strategic positioning and options for effective cooperation.
- Monitoring, evaluation and adjustment of the transformation process. This can be based on (1) qualitative methods, such as reflexive monitoring, dynamic learning agendas or field notes, or (2) quantitative metrics, such as Key Performance Indicators or composite indicators for each dimension (petal) of the transformation flower, or (3) combinations thereof.
- Social and transformative learning within a transformative learning environment.

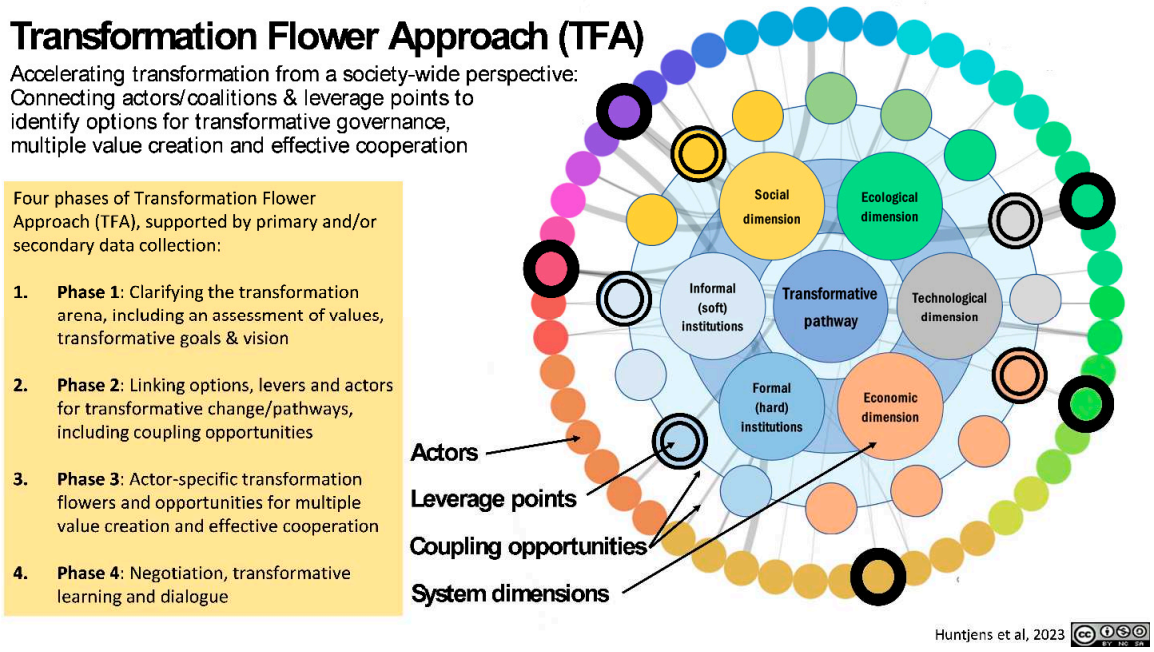

Figure 1. Summarized overview of the Transformation Flower Approach (TFA).

Broad stakeholder participation and transdisciplinary collaboration, e.g. through multi-stakeholder workshops for systemic co-design, are an essential part of the TFA-methodology, with the aim to engage and involve relevant stakeholders as early as possible in the process of developing collective outputs. Depending on several factors, such as synchronization with ongoing processes, the workshops could be organized at various moments, and more specifically to collect stakeholder input for several phases in the TFA. As such, a TFA multi-stakeholder workshop allows for a participatory assessment regarding the following core questions:

a) What are important leverage points and related actors or coalitions?
b) What are possible connections (win-win, coupling opportunities and/or trade-offs) between these leverage points?
c) What are priorities (i.e. leverage points with (expected) high transformative impact) and related time-scale?
d) Which actors to involve & to join forces?
e) Collective agreement on action agenda, strategy and/or implementation plan

By attending to these questions, the TFA connects agency with structure, as a necessary step to determine the power to influence, and to find options for actor coalitions to realize transformative

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change. In the remaining part of this section, we provide an explanation and illustrations of the various phases of the TFA, based on the application of the approach to the transformation of the Dutch food system.

Phase 1: Clarifying the transformation arena

The initial phase of the TFA proceeds from identifying the transformation arena. The notion of pathways is central in this context. Here we use the definition of pathways that is also applied in the IPBES Values Assessment (IPBES, 2022, p. 405), where a pathway to transformation is defined as a strategy for getting to a desired future based on a recognizable body of sustainability thinking and practice, driven by an identifiable coalition of actors. This understanding also asserts that each transformation pathway is context-specific and goal-dependent, with an aspiration to break-away from path-dependencies. Examples of contextual factors include the nature and extent of the societal change in question, the history of cooperation (or the lack thereof) between the parties involved, and the key biophysical, material, and socio-economic features of the area or pathway in question (Huntjens, 2019, 2021).

Transformation pathways are used to work towards desired futures. The TFA asserts that both incumbents and challengers should be involved in the formulation and implementation of these pathways, in an effort to exploit every possible opportunity for changes in a forward-looking way. Such collaboratively developed transformation pathways help to escape the gridlock of incumbent-dominated systems for which there are no perfectly developed alternatives in the short term. A transformative change process from system A to system B may involve a bundle of technologies, practices, resources and organisations. As such, it may need to accommodate a plurality of perspectives, visions, and theories in order to help achieving more buy-in and mitigating resistance to change. While some paths might be dominated by challengers and others by incumbents, power balances are dynamic, which makes them subject to agency (i.e., the ability to exert influence, see Ali-Khan and Mulvihill 2008; Newman and Dale 2005) and social skills. To avoid the peril of 'capture' by incumbents that have no serious interest in transformative change and ensure that transformative pathways do not end up by merely tinkering at the margins, it is important that actor coalitions for transformative change strategically build webs of influence and employ ideational power in an effort to gain the upper hand in legitimacy struggles (Markard et al. 2021).

During the first phase, we suggest to use the X-curve model (Loorbach, 2014, and modified by authors, see Figure 2) as a heuristic device to define the transformation arena along with an assessment of visions, values and goals based on the following guiding questions: (1) What needs to change in the current system, and (2) What needs to stop? While these two questions proceed from the current (often implicit) social contract (represented by the downward curve emerging from "system A" in the X-curve framework), two complementary questions attend to transformative visions and innovations (represented by the upward curve): (3) What needs to grow towards achieving a new Natural Social contract, and (4) What does a future perceived as desirable (or "system B") look like? In the following, as an illustration of how this framework may be applied to the development of transformative pathways, we summarize how discussions surrounding the Dutch food system transformation may be usefully structured around these four questions and in line with the goals of phase 1 of the TFA.

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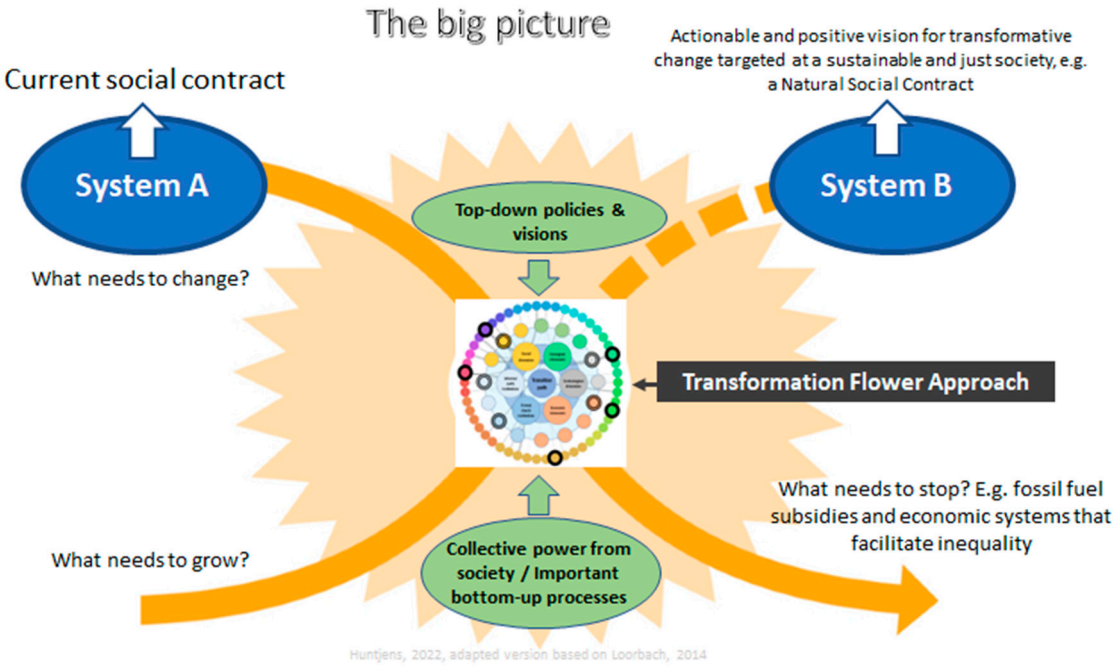

Figure 2. The X-curve model Loorbach (2014, modified by authors)as a heuristic device to define the transformation arena, corresponding to the first analytical phase in the TFA.

First, what needs to change? We proceed from the observation that study after study makes clear that current food consumption and production patterns exacerbate a number of urgent sustainability challenges in the areas of health and well-being of humans, non-human animals, and the planet. The Dutch agri-food sector has traditionally focused on production and efficiency, producing as much food per square meter as possible at the lowest possible cost and with a limited appreciation of value creation (Huntjens, 2019, 2021). Given a low willingness among consumers to increase expenditures for food, the food industry relies on highly efficient, low-lost production methods, providing few incentives to invest in sustainability measures and true cost pricing. This economic logic leads to a vicious circle. The predominant focus on productivity and profit maximization in 'free' global markets has shifted social and ecological costs and values into the background (*ibid*). Profit is narrowly defined in monetary terms by externalizing ecological and social costs, which means these 'hidden costs' are usually not reflected in the price of food (*ibid*). As a bottom line, the entire agri-food system has to change in order to ensure a sustainable, healthy and just future, both at the level of its materiality (current systems of provision and consumption) and in terms of its interwoven ideational and economic underpinnings.

Second, what needs to stop? Recent research in the area of social-ecological transformations has highlighted the need to actively govern the termination of unsustainable configurations (Koretsky, Stegmaier, Turnheim, and van Lente, 2023; Rinscheid et al. 2021; van Oers, Feola, Moors, and Runhaar, 2021). Along these lines, food system practices that are detrimental to soil and water quality and the wellbeing of humans, plants, animals and planetary ecosystems, such as harmful pesticides, may need to be phased out in a timely manner. Beyond technologies and practices, the targets of such interventions also include economic incentives and structures that foster the treadmill of production.

Third, what needs to grow? The current food system can be made more sustainable through wider adoption of nature-inclusive agriculture, short food supply chains, agroecology, sustainable and circular (high-tech) horticulture and animal husbandry, in which emissions are captured and turned into valuable products. At the same time, there is a need to shift diets towards plant-based substitutes, given the high environmental impacts of meat and dairy products and non-human animal suffering. Farmers may also widen their activities, including farm-based tourism and the provision of ecosystem services for which they are rewarded. Transformative change in this direction can be promoted by policies at the national and regional level. Moreover, there are opportunities for

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harnessing multi-system interactions and integrating various sectoral transformational pathways into a more or less integrated approach, for examples involving improved water management, renewable energies and closing material loops (Huntjens, 2021; Rosenbloom, 2020). The Greenport West-Holland initiative, for instance, tries to achieve a more sustainable horticultural system in combination with renewable energy generation, the closing of material loops (e.g. water, plastics and biomass) and shorter food supply chains. While far from complete, this illustration shows that there is much more to transforming food systems than production, kilograms, and certification (Huntjens, 2019, 2021).

Finally, what is a desirable future? Answering this question requires an assessment of values, norms, transformative goals and visions among stakeholders. This involves examining which values and norms held by individuals and organizations may collide with each other, and which ones are shared and could therefore be the basis for encouraging collective action. As argued in section 2.3, a useful assessment of values would attend to the specific empirical context under examination and be tailored to identifying transformational visions shared by actors in order to help carving out transformative pathways. In this sense, the identification of a shared value base in a multi-stakeholder process serves the purpose of developing a transformative vision and related transformative goals for a specific area or pathway.

The TFA is strongly linked to emerging new social contract theories, the principles of which are shown in Figure 3. Accordingly, it goes beyond achieving material goals and seeks to make all stakeholders part of better pathways of change.

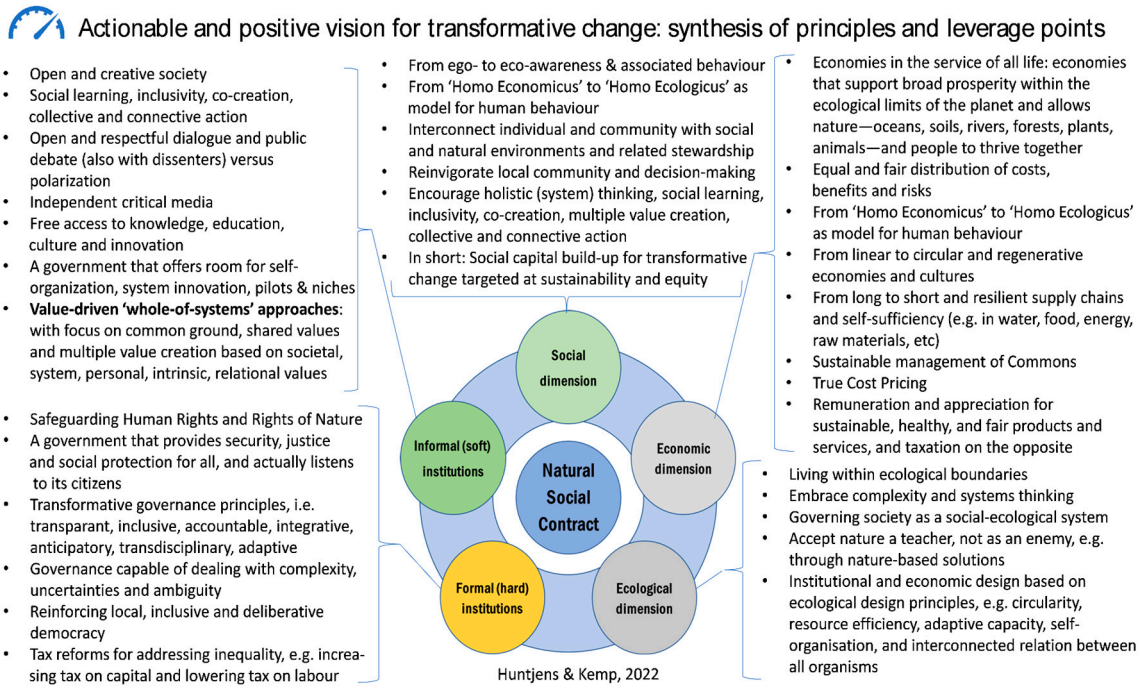

Figure 3. A Natural Social Contract as an actionable and positive vision for transformative change, including principles and possible leverage points / options for realizing transformative change (Huntjens and Kemp, 2022).

Phase 2: Linking options, levers and actors for transformative pathways

Phase 2 aims at achieving three objectives: (a) a multi-level stakeholder assessment, (b) identification of leverage points, and (c) coupling opportunities.

Phase 2a involves the identification of key stakeholders, referring to "all persons, groups, and organizations with an interest in the societal development in question, either because they are affected or because they can influence its outcome. This may include individual citizens and businesses, interest groups, government agencies, experts and the media" (cf. Huntjens, 2021). It is important to map the interests, incentives, and access to financial, personal, or institutional resources

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of all stakeholders who participate in the transformation arena. In addition, existing coalitions and partnerships need to be taken into account, since they can influence power dynamics. In order to better understand cooperation and decision-making, it will often be necessary to identify the preferred or dominant negotiation and influence strategies of each actor, as this information, when bundled, will provide greater insight into the role and influence of each individual actor (*ibid*).

Phase 2b involves the identification of leverage points. These leverage points are places in a complex system where a small change could bring about major changes (Meadows 2008). Some of these leverage points may be found in the underlying, often taken-for-granted structures of the system – e.g., dominant principles or mental models. Targeting such leverage points carries the promise of a broad transformative impact on the system. Identifying leverage points alone is not enough, however. System change also requires a good insight into the interrelationships of system elements and dynamics, for example, via (non-linear) feedback loops, and how desired outcomes can be achieved with maximum synergy effects and minimal 'trade-offs' (Kennedy et al. 2018). Adopting a systems-based approach helps recognize synergies and trade-offs, moving beyond linear towards more circular, inclusive systems (cf. SAPEA 2020).

The TFA facilitates the identification of leverage points for the six dimensions laid out in the flower (see Figure 1). We suggest using literature reviews and/or interviews to identify leverage points for each dimension, along with obstacles and opportunities for transformative pathways. To support collating such information, we have developed and tested a matrix that includes key questions for each dimension of the Transformation Flower. The key questions were derived from the principles and possible leverage points shown in Figure 3, but are formulated in an open way to provide a semi-open questionnaire that avoids bias as much as possible (see supplementary materials).

In search of leverage points, our own data collection process of the Dutch case entails an extensive content analysis of academic papers, reports from both NGOs and government bodies, news articles, and interviews with relevant actors. Figure 4 provides a synthesis of key leverage points and options for transformative change in the Dutch food system derived from our application of Phase 2b of the TFA. As such, the result is considered an essential building block of a transformation acceleration agenda for the Dutch food system. It relies on four transformation pathways: (1) Nature-inclusive and circular agriculture, (2) Short food supply chains, (3) Circular horticulture in the Greenport West-Holland, and (4) the Protein Transition. The detailed findings are included in the supplementary materials

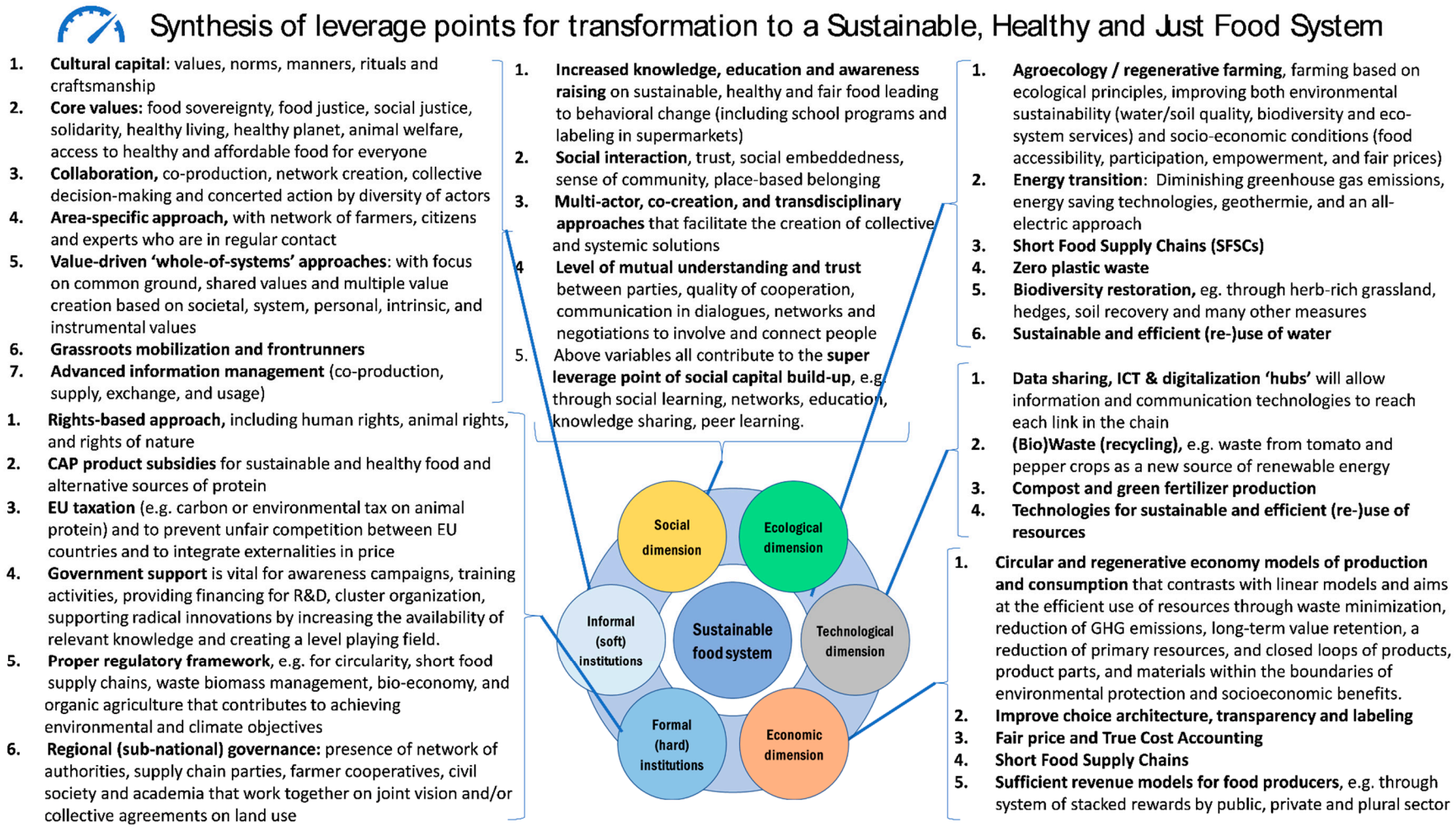

Figure 4. Synthesis of key leverage points / options for transformative change in the Dutch food system. This synthesis entails the key leverage points that appear most frequently in the literature, interviews and multi-stakeholder workshops. For a more detailed discussion, see the supplementary materials.

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Going beyond their identification, we acknowledge that interdependencies between leverage points exist. Phase 2c is hence concerned with finding coupling opportunities to inform transformational agendas. This exercise involves identifying not only interdependencies between leverage points, but also the interests and abilities of actors with respect to these leverage points along with structural constraints and opportunities for chain reactions (positive feedbacks). We also propose that during this phase, a prioritization of key leverage points should be conducted, for example by determining which leverage points can be expected to have the most far-reaching impact in realizing the transformative goals in question. We provide an example of a prioritization of leverage points and related actors and coalitions as well as interdependencies with other leverage points in Table 3.

It is important to bear in mind that most leverage points will depend on specific processes or circumstances, such as legislative processes, time sequences, market forces or consumer behavior.

Table 3. Examples of key leverage points (non-exhaustive) with related actors or actor coalitions, and interdependencies with other leverage points, that are vital in fostering **the protein transition** in the EU and the Netherlands in particular. Based on multi-stakeholder workshops.

Key leverage points	Actors or actor coalitions	Interdependency with other leverage points
Increased supply, promotion, and visibility of accessible, attractive and delicious vegetable protein	Retailers, supermarkets, cooperatives of vegetable protein farmers, catering industry and restaurants, EU and national government, certification organizations	- CAP product subsidies on protein crops (which is already present in Germany and Belgium) - Price incentives - Transition guidance and support for farmers moving towards varied vegetable production - Cooperation in the supply chain; - Improve choice architecture (e.g. vegetable protein on A-locations in supermarkets, in advertising, in catering industry and restaurants) - Communication to involve and connect people/actors; - Education and awareness raising on healthy and sustainable food; - Awareness raising and cultural change is needed in which non-vegetarian snacks and BBQ are regarded as undesirable & unacceptable; - Cultural norm and acceptance of plant protein (e.g. vegetarian as default option); - Concerted action by diversity of actors (mentioned as a super leverage point)
Cultural norm and acceptance of plant protein (instead of animal protein)	Schools (from primary to higher education), citizens/consumers, green NGO's, knowledge and education institutes, certification organizations, GPA, TcV, governments at all levels, supermarkets, catering industry and restaurants	- Education and awareness raising on healthy and sustainable food; - Promotion of dietary shifts towards alternative sources of proteins - Transition guidance and support for farmers moving towards varied vegetable production - Increased awareness on health risks of excess red and processed meat consumption on diet-related diseases, in particular non–communicable diseases (NCDs), such as cancer, cardiovascular diseases, obesity and diabetes - Animal welfare and ethics in social and political debate; - Awareness raising and cultural change is needed in which non-vegetarian snacks and BBQ are regarded as undesirable & unacceptable; - Ban on advertising cheap meat (e.g."Kiloknaller); - Labeling for creating transparency to consumers, e.g. ecoscore; - Knowledge development and exchange - CAP product subsidies on protein crops (which is already present in Germany and Belgium) - EU market protection with higher standards for environment and animal welfare - Price incentives - True pricing and/or tax reform to integrate externalities
Legislation, True pricing and/or tax reform to integrate externalities	EU and national governments, certification organizations, GPA, TcV	- Labeling for creating transparency to consumers, e.g. ecoscore; - Ecological boundaries are tangible or make them more tangible; - Environmental tax on meat, fish, dairy, eggs - Fair price and payment for services provided by farmer broader than only food (e.g. education, closer ties between citizen and farmers, ecosystem services, landscape management) - EU taxation (e.g. carbon or environmental tax on meat) to prevent unfair competition between EU countries; - EU production control and minimum prices in all livestock and arable farming (e.g. fewer animals per farmer); - CAP product subsidies on protein crops (which is already present in Germany and Belgium) - EU market protection with higher standards for environment and animal welfare - EU market protection with import duties on soy, meat and all products for which sustainable alternatives are available in Europe; - Awareness on health and environmental aspects of animal versus plant protein; - Accounting of risk of zoonoses in intensive livestock areas - Increased awareness on health risks of excess red and processed meat consumption on diet-related diseases, in particular non–communicable diseases (NCDs), such as cancer, cardiovascular diseases, obesity and diabetes - Legislation to improve animal welfare (e.g. prohibit factory farming, maximize number of farm animals per farm, prohibit imports of products from factory farms, keep calves longer with their mothers etc.) - Better enforcement of animal protection legislation in slaughterhouses; strengthening animal protection in slaughterhouses (slower pace etc.)

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Phase 3: Actor-specific transformation flowers and opportunities for multiple value creation and effective cooperation

Phase 3 is geared toward the following two outputs: (a) actor-specific transformation flowers, and (b) identifying options for multiple value creation and effective cooperation. The TFA thereby supports stakeholders in enhancing strategic alignment of policies and of business practices and institutional work, and in finding coupling opportunities to embark on a transformative pathway.

Complementing the systemic perspective taken in Phase 2, we propose to support and empower specific actors with a tailor-made transformation flower that provides an actor-specific overview of leverage points. For any individual actor, it is necessary to identify which leverage points are being implemented or targeted, as part of their influence strategy, and which leverage points are considered as an option, resulting in an actor-specific transformation agenda (see example in Figure 5). Some actors may have different roles, ambitions or influencing mechanisms per leverage point. This differentiation per actor is an important addition to standard stakeholder analysis, because an actor can play different roles on different systemic leverage points. This information may also provide additional insight for the actor itself in order to support or strengthen its policy coherence, course of action or effective cooperation with others.

The allocation of key variables to specific actors is also relevant for indicating whether all relevant parties support a specific transformative pathway. As part of this analysis, it may turn out that some parties that could potentially play a relevant role are not yet involved.

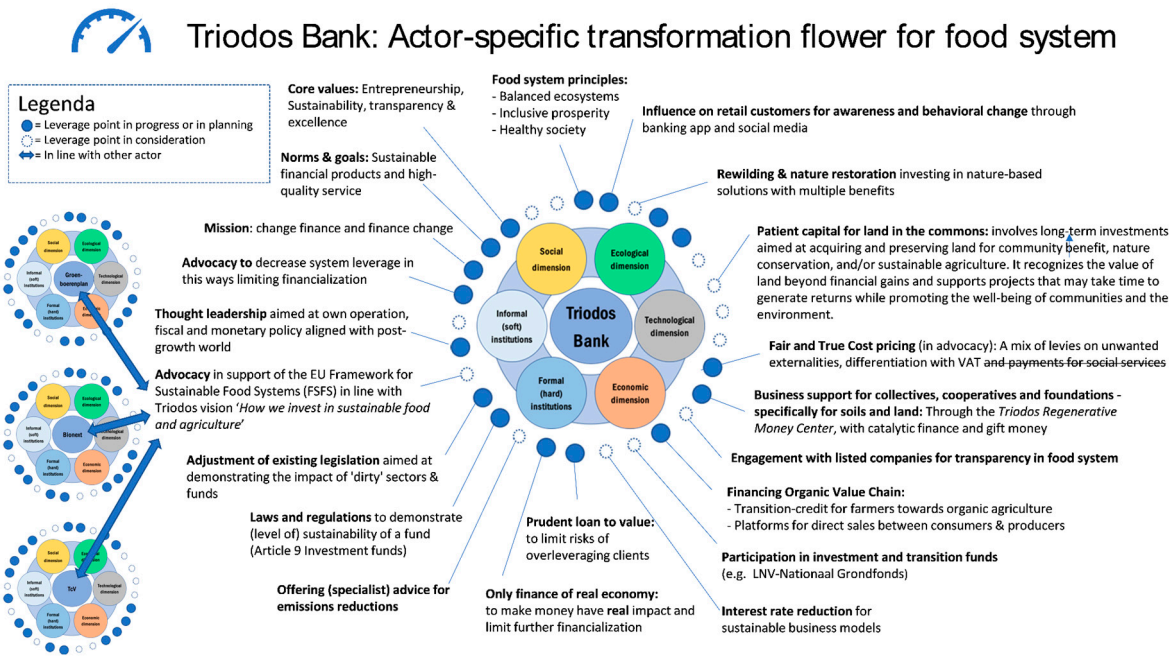

Figure 5. An actor-specific transformation flower for Triodos Bank, developed by authors and Triodos Bank. On the left side there is an example of a leverage point that is in line with three other actors, and thus provides an opportunity for effective cooperation.

In addition to a regular stakeholder analysis, this phase will zoom in on how different actors relate to each other and how they influence the transformation pathway, thereby offering a novel method of power mapping and political economy analysis. This method takes the actor-specific transformation flowers (see example in Figure 5) as key inputs, and compares them on similarities and differences. Our first assumption is that actors with a high level of similarity on leverage points, values, transition goals and vision will cooperate more easily, while actors with a high level of difference are less inclined to cooperate. Our second assumption is that more effective cooperation can be realized by coalition(s) of parties that offer complementarity in agency (i.e. the power to influence), for example by means of human capital, knowledge, technology, financial resources, or

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access to political and administrative networks. A legal mandate or the support of a large constituency can also be reasons to seek cooperation if one of the parties does not have this at its disposal, but is working on the same transformative goal(s). Our third assumption is that some tensions cannot be resolved and contestation is part of transformation. To only aim for consensus is not transformative at all, especially if current power relations are repeated in a multistakeholder setting. Paying attention to the quality of the conversations in which negotiations take place is therefore key, not to reach consensus, but to know the various perspectives, including the logics behind them and the power dynamics that are at stake.

A visual representation of this type of power mapping is shown in Figure 6, including two examples of leverage points that are shared with other actors (see corresponding numbers): 1) a political difference between actors, in this case requiring negotiation to resolve the conflict, and 2) a similarity between actors with different agency, and thus providing an opportunity for effective collaboration.

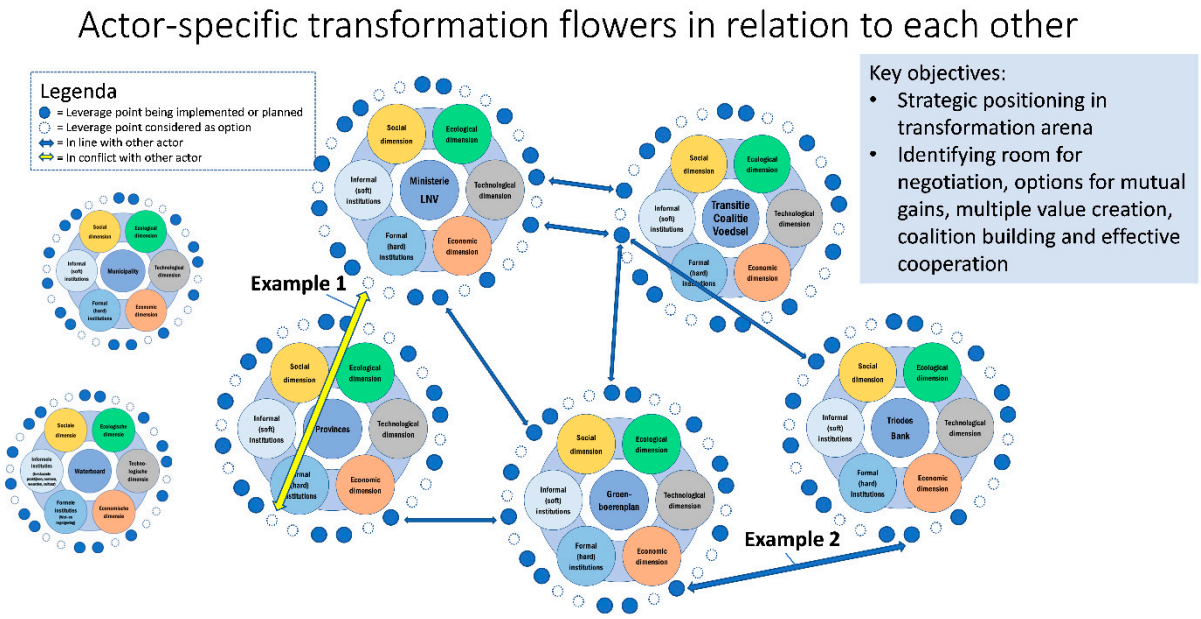

Figure 6. Actor-specific transformation flowers in relation to each other.

Phase 4: Negotiation, transformative learning and dialogue

Clearly, the transformation of the food system depends on collaboration between stakeholders with different backgrounds and interests, which means that negotiations have to take place.

The distinction between distributive and integrative negotiations is insightful (Pruitt and Carnevale, 1993). Distributive negotiations start from the idea that there is a cake and it has to be divided. When one person gets more, the other gets less. A distributive negotiation is typically characterized by 1) over-questioning, hoping to get somewhere in the middle, 2) silent about own interests, and 3) no concern for the other. Whereas a distributive negotiating style is common in market relations it does not yield much in negotiations on the transformation of the current food system (Aarts and Van Woerkum, 1999). Negotiations will then have to take place in a different way: instead of dividing the cake, a new cake is baked, in which joint decisions are taken on the ingredients, the baking process and the intended result. An integrative negotiation is characterized by 1) concern for the other from the perspective that negotiation is only successful if all parties involved consider so, and 2) joint investigation of facts and values that is agreed upon by parties involved and that serves as a basis for next steps to be taken jointly. Integrative negotiation is difficult, precisely because it has to be applied in complex situations where interests are fundamentally different and often

conflicting. Research shows that people quickly dig into their positions, of which they then try to convince the other (see for example Lems et al, 2013; Van Herzele en Aarts, 2013; Van Herzele et al, 2015; Bleijenberg et al, 2018).

An integrative negotiation style places high demands on the quality of the conversation. Such conversation should take the form of a dialogue. Other than in a discussion of a debate there are no opponents and no winners in a dialogue (Bohm, 1990). All participants and their input are respected, also if they think in fundamentally different ways. The aim of a dialogue is to explore and understand the differences between dissenters, and then to arrive at a common idea, a shared value, a collective conclusion. Dialogue is a connecting concept: despite major differences, a dialogue makes it possible to continue to communicate effectively.

This can lead to a change in old ways of thinking and to the emergence of new, shared perspectives, but that is not necessarily the case. Dialogue is about creating sufficient common ground to develop perspectives and activities that are shared by all parties concerned. An overlapping consensus (Rawls, 1971) is sufficient to arrive at a jointly chosen trajectory, without the parties involved having to beforehand give up their own ideas and identities, but instead explore what conditions are needed to stay involved. Obviously, such dialogues will need to be facilitated by professional boundary-spanners (Aarts, 2018).

The mutual gains approach is highly valuable in situations where two or more people are negotiating to reach an agreement that may be of benefit to both or all of them (Consensus Building Institute 2014). The MGA-approach lays out different steps for negotiating better outcomes while protecting relationships and reputation. "In the search for mutual gains, participants are encouraged to explore more ways to create more value (i.e. to increase the pie) and generate a broader vision on sharing benefits. To illustrate, whenever action is taken to remedy environmental problems, the benefits also cascade: for instance, nurturing wildlife and flora in a wetland can also reduce water pollution and soil erosion, and protect crops against storm damage, alleviating water scarcity and allowing sustainable food production" (cf. Huntjens, 2021).

The development of a context-specific agenda for transformative change is only one step in longer trajectories of co-creation and collective action. In this regard, transformation requires iterative learning cycles of monitoring, evaluation and transformative learning, which usually require longer trajectories of co-creation with sufficient time for reflexive monitoring, evaluation of interventions, and translating those lessons into a new cycle of 'plan-do-evaluate-respond' (Huntjens, 2021). This provides a foundation for reflection and social learning, while at the same time supporting accountability and an adaptive approach to deal with ambiguity, complexity, and uncertainty, including unforeseen political or economic developments.

Transformative capacities can be strengthened through the strategic design of transformative learning spaces (Moore et al., 2018). Transformative learning can constitute a deep leverage point for a variety of actors for systemic change (Richardson et al., 2020).

Besides transformative learning, complex interaction effects are made a point of attention and scrutinisation. Social practice theory suggests that 'group behaviour is shaped by a combination of cultural norms and habits, rules and regulations, modes of provision, and infrastructures that together determine the ways in which people behave' (cf. Strengers and Maller 2014).

Actors often have implicit understanding of such interaction effects and possibilities for achieving systemic change. In this regard, we highlight the power of storytelling and narratives of change. When combining the strengths of stories—for instance about sustainability heroes—with that of system's thinking it provides a powerful approach for transformative learning (e.g. see Tyler and Swartz 2012), and the application of complexity thinking in all social-ecological systems (Huntjens, 2021). This combination of storytelling and system thinking in order to facilitate transformative learning and institutional change is known in literature as 'Narratives of Change' (Krauß et al. 2018; Wittmayer et al. 2019; Huntjens, 2021).

5. Discussion

TFA is a transformative governance approach which makes use of the steering models of other transformative change approaches (as showcased in Table 1). Like transition management, it seeks[1]:

- to make "the future more clearly manifest in current decisions, by adopting longer time frames;
- to explore alternative trajectories, and opening avenues for system innovation, through the transformation of "critical societal subsystems within which unsustainable practices are deeply embedded";
- to develop interactive processes where networks of actors implicated in a particular production/consumption nexus can come together;
- to develop shared problem definitions, appreciate differing perspectives, and above all develop practical activities", by "linking technological and social innovation, because both sorts of change are necessary if society is to move on to a more sustainable pathway"
- to support 'learning -by-doing ', developing experiments with novel practices and technologies, because it is only by initiating change that we can learn the potential (and the limits) of different approaches"
- to encourage and allow "a diversity of innovations ('variation') and competition among different approaches ('selection') to fulfill societal needs".

It opts for a small-wins approach and transdisciplinary learning within a pathway approach. It uses leverage point thinking (pioneered by Meadows) in a area-based stakeholder approach (as advocated by socio-ecological transformation scientists (Olsson et al. 2014; Westley et al., 2013). The innovation systems functions approach (Bergek et al., 2008) can be used as a diagnostic tool for finding bottlenecks and signals (highly connected elements). Transformative governance principles (proposed by Visseren-Hamakers et al., 2021) are used, as well as ideas about co-evolutionary governance (forms of steering that are mindful about interaction effects between systems/domains and which work simultaneously on agency and structure) (van Asche et al. et al. 2014).

New elements of TFA are: the attention to multiple value creation, the search for transformative leverage points which are discussed with stakeholders interested in transformational change (including government who is ambivalent about it), the attention to root causes of unsustainability, power and values as pivotal elements of transformations whose agency is complex and not under the control of any actor (but endogenous to transformation processes). Values are explicitly considered, together with issues of equity and justice. In so doing, it differs from most transition approaches, which are more functionalist (except just transition approaches).

The TFA uses important criteria of transformative governance, i.e. inclusive, adaptive, integrated, anticipatory and transdisciplinary, but is mindful about limits of principle-based approaches. Almost the same governance principles have been advocated 20 years ago and 'adopted' (see e.g. OECD Good Governance Principles) but we have (unfortunately) made little progress with them. What happened was that strong regime players paid lip service to them for reasons of preserving the status quo. The transition flower approach wants to avoid this through a pathway approach and a form of governance that goes beyond a set of values and principles. That is also the reason why the IPBES Transformative Change Assessment is interested in the TFA as a practical (transdisciplinary) model for achieving transformative change.

The pathway approach based on the transformation flower bridges the gap between desirable projected futures and the adjacent possible. It may enroll all kind of actors, including incumbents. The practical and idealistic have both a role to play in it, which helps to deal with the pitfalls of each: a forward-looking element is added to pragmatism and idealistic thinking is enriched with attention to doings (that actors are capable of doing and which are attractive for the actors concerned). Although we do not underestimate the power of incumbents, we think that they can be enrolled in processes of transformative changes through positive outcomes for them (helping them find new practices and by making established practices less attractive). The TFA offers a framework for

[1] Between quotations are statements from Meadowcroft (2009) about transition management.

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identifying interventions with stakeholders (participatory leverage point analysis), but also accepts that other interventions (to be determined) should follow. It makes use of possibilities for change (identified and enacted by relevant actors themselves) and is engaged with institutional change. It inserts greater reflexivity in processes of problem solving and governance, which thus far offer a weak stimulus to transformative change. It thus goes beyond analysis.

There is no guarantee that sustainability transformations (in agriculture or energy) will be achieved, but this is true for every steering approach. Dangers of co-optation exist but it is hoped that this can be counteracted in the process, through the actions of government and scientists who have less of a stake (although none are completely impartial) in particular economic or ecological outcomes than business and NGOs. One of the most difficult choices is to introduce control policies in a collaborative stakeholder process. A progressive introduction of true cost pricing and command-and-control policies may abate opposition and signal to business actors that the current business model is not economically sustainable. It is very difficult for governments to commit themselves to a phase-out, but the stakes for shifting towards more transformative practices can be politically 'managed' (by using opportunities for this). In agriculture, such an approach has been used after the second world war for the modernization of the agricultural sector in the Netherlands (Grin et al. 2004). The new challenge is no longer to produce more, but to produce more sustainably. This requires a systemic approach in which the whole range of negative effects are being considered (nitrogen emissions, greenhouse gas emissions, animal health, zoonotic diseases/risks and nature regeneration and unhealthy consumption) in a more integrated way. The involvement of many actors (including scientists and local government and NGOs) enlarges the transformative agency of farmers, by having collaborators (instead of enemies). In the Netherlands, the wish to achieve a quick restructuring of the agriculture system backfired, with farmers taking to the street and mobilizing public support. The local elections in 2023 were won by a new farmer party (BBB) which became the biggest party in 11 of the 12 provinces. They also became the biggest party in the chamber of reflection (which is developing into a chamber of power politics). If the national government is distrusted and resented by a large part of the populace, a top-down agenda is likely to provoke negative reactions from a wide range of actors (including populist parties). The persistence of problems and conflict with EU regulations will continue to put pressures for change on the sector.

The proposed pluralistic transformation approach incorporates the suggestions offered by Rosenbloom et al. (2020) for energy transition policy: i) embed the low-carbon transition in a broader transformative agenda, ii) build societal legitimacy for climate policy, iii) encourage the growth of constituencies with a material interest in climate-friendly transformations, iv) create a supportive ecosystem of institutions. Such proposals help to develop attractive configurations that work as part of a co-evolutionary steering approach through connecting actor-coalitions and interdependent systemic leverage points. Transformative pathways are pursued in a step-wise manner, with attention to multiple agendas (a just transition, a circular economy and the energy transition and a deepening of democracy and weakening of populism). Governance *for* transformative pathways is combined with transformations *in* governance (cf. Burch et al. 2019). Governance for socio-technical pathways is created "in the going", based on dynamic experiences, circumstances and remaining problem gaps. Attention to multi-level governance should better align governance systems (collibration), with useful suggestion provided by Jessop (2003). Control policies pursued at higher levels of governance (national and supra-national) remain important, to tilt the playing field for all actors. They encourage and benefit from collective action for transformative at lower levels.

6. Conclusions

In this paper, we introduced the Transformation Flower Approach as a theory of change that can simultaneously serve as a tool to nurture transformations in systems of provision and consumption. The TFA integrates social scientific theories and models relevant for transformative change, such as complex systems thinking and governance theories, and interrogates these in light of established models of, and experiences with, transition steering. Our presentation of the TFA benefits from direct experiences several of the authors made in implementing the phase model of the TFA in

regional food system transformation projects. The fact that the TFA provides a holistic and transdisciplinary approach that can neatly be applied in practice, as demonstrated by its application in the ongoing societal transformation of the Dutch food system, distinguishes the TFA from other transformative change approaches.

Proceeding from the notion of pathways, the TFA offers a toolbox that aids in working towards desired futures, involving both incumbents and challengers in an effort to harness untapped yet proximal potentials in a forward-looking way. By embracing innovation, the TFA not only promises to circumvent a substantial amount of resistance to change, but also serves as a step-by-step approach to identify options for multiple value creation and effective cooperation. Going beyond other approaches for transformative change, the TFA engages with deep-seated societal values, as these determine the structures and decision-making procedures of current and future systems. Our approach therefore attends to the deepest layer of complex systems, which, following Meadows, are often represented by an iceberg model.

One of the main benefits of the TFA, we believe, is that it is action-oriented. Based on the phase model, practical ways of achieving positive outcomes can be identified, tested and made the subject of collective action, governance and institutional change. Thereby, it provides the tools to make Individual and collective steering more future-oriented and values-based.

The TFA can be used to build an acceleration agenda for different transformative pathways in an action-oriented way in chosen areas (regions). This might be done by using actor-specific transformation flowers, which are positioned in a system constellation to indicate power dynamics, foster strategic positioning, and find options for effective cooperation. This way, options for co-evolutionary steering and governance interventions that foster the transformation towards a sustainable and just society can be identified. By relying on multiple pathways, buy-in from a wide range of actors can be achieved. This helps to circumvent opposition (e.g. from industrial farmers) who are incentivized and helped to go beyond technical fixes.

We demonstrate the analytical and practical value of the TFA by discussing action perspectives at various levels and scales in the context of the Dutch food system transition, including (1) area-oriented approaches, (2) acceleration agendas for specific transformation pathways, and (3) actor-specific transformation flowers. In developing these, we emphasize the importance of interdependencies between leverage points. As a theory of change, our approach helps to identify opportunities to link transformative options (the what), actors (the who), and levers (the how) in dynamic interaction to embark on transformative pathways.

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