Food Value Chains:

Existing policies & action of the One Planet network along the value chain
Draft 24 November 2020

The science is clear on the need to decouple economic growth from natural resource use and environmental impacts. Yet this evidence does not always reach key decisions makers in a way that is relevant and actionable. To address this challenge, and as requested by the 4th UN Environment Assembly, the International Resource Panel and the One Planet network established a task group bringing together the experts on natural resources and the practitioners implementing sustainable consumption and production. The task group aims to catalyse science-based policy action on sustainable consumption and production, thereby providing actionable insights on the management of natural resources in relation to the 2030 Agenda for Sustainable Development. To achieve this, the task group took a sectoral focus and applied the value-chain approach.

The value-chain approach aims to identify hotspots and shape corresponding actions built on existing knowledge and available data. Data and information are analysed and organised under three key steps as illustrated in the diagramme below.
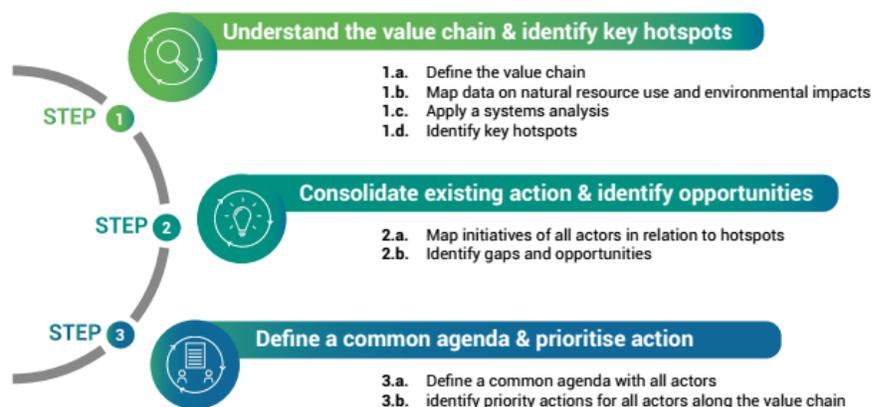

Figure 1: Overview of the key steps of the value-chain approach

The practical illustration of the benefits of the value chain approach to define SCP action that is informed by science is illustrated by its application to the three prioritised sectors of Food, Construction and Textiles.

This report focuses on the application of the second step of the value-chain approach to the Agri-food sector. **It maps existing policies and actions of the One Planet network along the food value chain and analyses these in relation to the identified key intervention areas and hotspots**, both in terms of what can be leveraged for further impact and where major gaps in addressing the hotspots can be found.

I. Methodology

This analysis undertakes a mapping of policies and activities from across the One Planet network along the stages of the food value chain, and against the three core food system challenges that need to be addressed. The purpose of this mapping is to identify what activities are currently taking place and how these connect with the findings of the food value chain analysis. From this mapping, several trends, gaps and opportunities have been identified that can inform and guide future priorities across the network.

Dataset

The data sources for this analysis are: a) the official reporting on SDG indicator 12.1.1 for the policies and b) the One Planet network reporting complemented by programme content featured on the One Planet network website. Policies and activities were selected based on their relevance to food value chains.

Mapping of policies and activities along the value chain

The analysis of the food value chain (step 1 of the value chain approach) defined the stages of the value chain and highlighted the importance of the 'middle stages' of the value chain, comprising food processing and packaging, retail and food services, in influencing and shaping both primary production and final consumption.
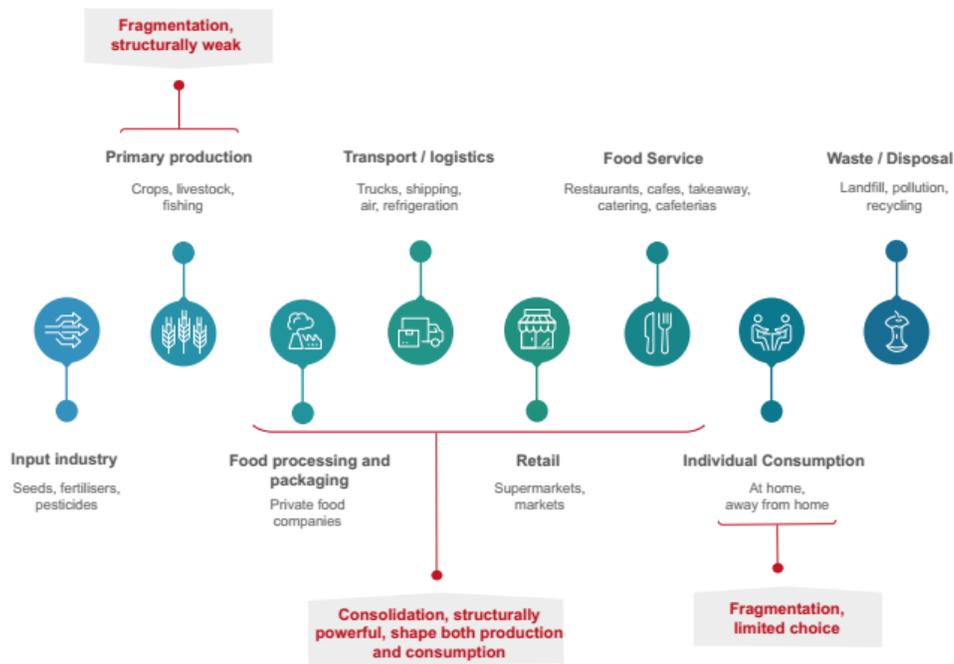

Figure 2: Simplified overview of the food value chain and key systemic features

Accordingly, policies and activities were mapped against the different stages of the food value. They were mapped to the stage of the value chain which they primarily target, acknowledging that projects sometimes target other stages, though to a lesser degree. Several policies and activities did not address a specific stage of the value chain specifically, but rather took a holistic approach that aimed to address all stages of the value chain in some way - these have been categorised as 'General'.

Categorisation of policies and activities in relation to identified challenges

The analysis of the food value chain identified three core challenges. These are:

1) ***How we produce food:*** The majority of natural-resource use and environmental impacts takes place during production. Changing production practices is critical to using resources more efficiently and sustainably, while causing less damage to the environment.

2) ***How much food we produce and consume:*** One-third of all food produced is either lost at the production, transportation or processing stages, or wasted downstream in the food at the retail, food service and consumption stages.

3) ***What types of food we produce and consume:*** Different types of food can embody large differences in the natural resources used and environmental impacts caused along the stages of the value chain including production processing, transportation, and disposal[1].

Policies and activities were organised, within each stage of the value chain, according to which of the three challenges they addressed. As per value chain stages, policies and activities were categorised according to the challenge that they primarily addressed, acknowledging that some projects addressed other challenges, though to a lesser degree. A large number of projects addressed two or three of the challenges in the same project.

While the above three challenges may appear to relate more closely to certain stages of the food value chain, the systemic nature of value chains means there are many feedback loops and interactions between the different stages that can affect other stages elsewhere. For example, the choices that a retailer makes in what products to procure or what standards to apply will ultimately affect how food is produced at the primary production stage of the food value chain. Therefore, each of the above three challenges can be addressed at many different stages of the food value chain.

The full food value chain analysis is available here.

II.   Policies: Key trends, gaps and opportunities

The official reporting by countries in 2019 on SDG indicator 12.1.1, on the implementation of SCP related policies, collected 226 policy instruments. Of these, 27 policies, either specifically about food or those policies with a specific section on food, were retained for analysis. All policies referred to in this section are listed in Annex I.

Of these 27 policies, nearly half (12) were from Europe and Central Asia, followed by Latin America and the Caribbean (6), Africa (4), Asia/Pacific (3), Middle East (1) and North America (1). In terms of the types of policies analysed, macro-policies (national strategies, roadmaps or plans) – whether focusing exclusively on food or not – represent three quarters (74%) of the policies analysed.

Although based on the reporting choices of 43 countries and therefore not on an exhaustive list of food related policies around the world, this analysis aims at identifying some of the trends, opportunities and gaps which current policies addressing the food value chain may present, and at complementing the analysis being done on the programmatic side to identify where the One Planet network is best positioned to act.

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[1] Acknowledging that the same food type can be produced in different ways and in different landscapes and climates, which would have an impact on the environmental footprint of that food, however this is a generalisation based on lifecycle analysis of food types and food type environmental footprints, see Poore and Nemeck.

Overview and key messages

The diagramme below provides an overview of the policy in relation to 1) the stage of the value chain primarily targeted, 2) the type of policy measure (regulatory and legal instruments, economic and financial instruments, voluntary and self-regulation schemes), and 3) the challenge they primarily address (how we produce, how much we produce and consume, what we produce and consume).

VALUE CHAIN STAGE	Inputs			Production			Processing/ packaging			Transport/ Logistics			Retail			Food Service			Consumption			Disposal		
Type of measure	REG	ECO	VOL	REG	ECO	VOL	REG	ECO	VOL	REG	ECO	VOL	REG	ECO	VOL	REG	ECO	VOL	REG	ECO	VOL	REG	ECO	VOL
How we produce	15	5	10	9	5	10	1	2	2				2	2	3	2			1		2			
How much we produce and consume				2		4	3		4	1		4	1		6	3		6	3		12	2	4	
What we produce and consume	3		3	3		0	3		4	1	1		7	4	5	7	1	7	1	2	12	1		

Table 1: Overview of the number of measures in relation to the stage of the value chain it targets, the type of policy measure and the challenge addressed (Type of policy measures included: Regulatory (REG), Economic and Financial (ECO), and Voluntary (VOL). For ease of reference areas with the highest number of policies are highlighted in light green and areas with no policies are highlighted in orange)

National policies and instruments are designed to achieve specific objectives but also to plan for concrete actions. From the 27 policies analysed, a total of 191 concrete measures were identified, addressing various stages of the value chain, albeit it not in equal representation[2]. Key messages derived from this analysis include:

A concentration of measures at the two ends of the value chain:
Nearly 60% of the measures proposed are either at the input/production phase or the consumption phase. On the production side, the majority of regulatory measures tend to focus on efficiency increases (e.g. reducing water use, decreasing emissions from livestock), or reducing the use of harmful pesticides and increasing organic production.

In general, if the size of the farm targeted by a measure is specified, it is targeting smallholder farms. It is less clear if the measures in these policies are aimed at larger scale industrial agriculture, but if so, it is much less explicit than the focus on smallholders.

Regarding the consumption end of the value chain, the observation can be made that the onus of 'being sustainable' is placed primarily on the individual consumer, who does not have the same amount of influence on various levers as the players a bit more upstream in the value chain might have. Additionally, the large majority of the measures are voluntary and so will not have the same impact that more binding efforts would.

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[2] Input industry (36), primary production (33), processing & packaging (19), transport/logistics (7), retail (30), food service (26), individual consumption (33), and waste/disposal (7).

The focus on the ends of the value chain may indicate the difficulty for policy makers to access, regulate and influence the more consolidated stages in the middle of the value chain. The fragmented and more disparate nature at production and consumption sides make it easier to pass more overarching measures.

A mixed approach but a deficit in economic and financial measures:
Of the 191 measures identified, a good mix of voluntary and regulatory measures (respectively 94, or 49% and 71, or 37%) was found. Economic and financial measures on the other hand, only represent a minor portion of what is being planned to achieve the objectives of the policies (26 measures, or 13% of all measures identified). The official reporting on 12.1.1, including all types of policies beyond those targeted at the food value chain, also revealed a general deficit in economic and financial instruments for SCP[3].

Voluntary measures such as information campaigns to raise awareness, training programmes, and access to tools and guidelines are present at all stages of the value chain, although particularly prominent at the level of individual consumption. Regulatory measures are also present throughout the value chain, but more so during the production phase. These include directives on the use of pesticides, setting aside land for certain crop use, and sanctions for non-compliance with waste disposal procedures, and they often complement the voluntary schemes. Economic and fiscal measures, such as the removal of harmful subsidies are less prominent, representing only around 13% of the total measures.

Food challenges well captured but not always as interconnected along the value chain:
In terms of which key question these 191 measures address, 71 look at *how we produce,* 65 look at *what we produce and consume* and 55 look at *how much we produce and consume.*

However, these types of measures are not evenly distributed along the stages of the value chain. Measures taken at the input and production stage are almost always meant to rationalize the use of resources or energy, minimize the use of harmful substances such as pesticides and the related environmental impacts, or to minimize emissions of pollutants harmful to the environment and health (*how we produce*). Rarely are those measures taken at primary production stage intentioned to improve the quality of food products for consumers for example. On the other hand, most of the measures taken at the consumption phase are looking at issues of food loss and waste and sustainable diets (*how much we produce and consume, what we produce and consume)*, quite independently from how food is produced or processed it seems.

The relative balance between the key challenges that these measures are addressing is a positive sign, indicating that overall there is not a large gap in terms of policies which look at production processes, food loss and waste, and the types of food being produced and consumed. What is missing, however, is a better understanding of how the different stages of the value chain interact with one another in addressing these challenges. In addition, there is a gap in the middle stages of the value chain, which has the potential to make stronger links between how we produce and how and what we consume.

Food processing almost completely absent, retail and food service reveal gaps and opportunities:
At the stage of food processing and packaging, there are a host of measures which focus on the type of packaging, but almost none which look at the transformation and processing of food products. Food processing is a massive industry and the lack of attention in the policies is a major gap. Food processing is also the stage at which the link between what we produce and how we consume is most evident. There are obvious links to human health and

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[3] https://www.un.org/ga/search/view_doc.asp?symbol=E/2020/56

well-being as well, in terms of the effects that highly processed and transformed food has on health, and future policies should reflect this.

Compared to processing and packaging, the retail and food service stages of the value chain actually have a much greater number of measures proposed in reported policies. However, the measures, which are most often voluntary, tend to not target most influential, large retail operations with large market share. As the retail stage is a key middle driver in the value chain, future efforts should be made to address this current lack of attention paid to the largest and most influential players in food-related policies.

Reported policies show that procurement regulations can play a key role in supporting sustainability practices along the food value chain, for example by simultaneously promoting local sustainable products and healthy diets. Further measures in private procurement could be envisaged to complement these efforts. The number of procurement measures offer more potential due to their legally binding nature, though they are often also being proposed on a small scale rather than nationwide.

Analysing policy measures along the value chain

1. **Input industry & Primary production**

These two entry stages of the value chain represent together 69 of the 191 measures identified across the policies, which is more than a third (36%) of the total. The vast majority of these (78%), naturally, are addressing the question of production practices (*How we produce*).

In terms of the types of measures, nearly half at this stage (46%) are regulatory in nature, and typically center around the production, use and distribution of pesticides (e.g. Sustainable Directive on Pesticide Use of the E.U) including a focus which often centres around organic agriculture. Additionally, some measures focus on the distribution of land for certain agricultural practices, such as Sweden setting aside land for local and regional varieties. In Brussels, the regulatory environment is focused on helping stimulate urban agriculture.

A number of economic and financial measures are also present in some of the policies. In the case of the European Union, a series of 'eco-schemes' will offer a major stream of funding to boost sustainable practices, such as precision agriculture, agro-ecology (including organic farming), carbon farming and agroforestry provide financing to bring to market sustainable inputs to the value chain. Other countries such as Jordan focus more on the elimination of harmful subsidies in order to encourage sustainable inputs.

A large number of voluntary measures are also present, such as training programmes for farmers (Tunisia), the promotion of certain integrated pest management techniques (Pakistan), or the production of toolkits to assist urban farmers get started (Belgium).

In the large majority of the measures proposed at the input or production stages (whether regulatory, economic, or voluntary), the focus is on the environmental impacts (GHG emissions, wastewater treatment) and savings in energy and increased crop yields which can be gained by such measures.

It should be noted, however, that in some countries the socio-economic aspect is woven directly into the measures taken at this stage of the value chain, with a strong focus on assisting smallholder farmers have access to loans (Tunisia), or the redistribution of land in a more economical fashion (Ecuador).

2. **Processing & Packaging, Transport**

The processing and packaging, and transport stages represent only 26 of the 191 total measures identified in the full analysis (13%). On processing and packaging, it is interesting to note that nearly all identified measures concern only packaging, whether from a material use perspective (*how we produce)* with a focus on the package design as a way of reducing spoilage/waste (*how much we produce and consume),* or looking at the safety of package materials from a human consumption perspective (*what we produce and consume).* The question of processing is almost entirely absent, which indicates a significant gap. In taking a food systems approach to the value chain analysis, it is evident that the major food challenges cannot be addressed in piecemeal fashion. The absence of measures targeting the critical stage of food processing and transformation – which has enormous power to influence production and consumption practices - undermines efforts to address the most pressing food challenges of today in an interconnected and holistic way.

Similarly, the absence of measures related to transport is stark, with only 7 in total, none of them relating to production practices. The measures which are taken tend to be voluntary in nature such as the use of merchandise management systems to coordinate quantity, quality and delivery time of raw materials and foodstuff (Germany); or not very specific, such as a vague reference to improving the distribution system for essential food (Pakistan).

3. Retail, Food Service

The retail and food service stages of the value chain have a significantly larger portion of measures identified, both from retail (30) and food service (26). Together these represent nearly a third (30%) of the total measures, most of them being regulatory measures at acquisition stage and voluntary or information-based measured directly targeted at consumers.

On the regulatory side, of particular interest is a number of measures around procurement: giving establishments in certain municipalities the power to eliminate single-use plastics from procurement (Costa Rica), introducing measures to increase the volume of organic food and services procured (Sweden), or setting general minimum sustainability requirements in tenders (E.U.).

On the voluntary side, there are a variety of measures, including information-based, such as the promotion of various ecolabel schemes in shops (Germany), campaigns to promote 'climate-change friendly' food in cafeterias (Finland**Error! Reference source not found.**), or schemes to promote the efficient collection of used bottles from restaurants (France**Error! Reference source not found.**).

It is interesting to note that retail and food service stages, if viewed as their own miniature value chains, actually reproduce many of the patterns that we see at the larger value chain level: the predominance of input and primary production and consumer-centred stages, with a notable gap in between. The measures primarily focus on the types of inputs to the system (through procurement) or disseminating information and tools to consumers in food service and retail structures to help them make decisions on things like labels and disposal methods.

4. Individual consumption & End of life disposal

At the other end of the value chain, 40 measures focus on individual consumption and disposal at the end phase of the value chain (21%). Interestingly, 24 of these measures are voluntary, and addressing either the '*how much we produce and consume'* (food loss and waste) or *'what we produce and consume'* (what type of food) questions.

Within these voluntary measures, several focus on the issue of food loss and waste by addressing the question of '*how much we produce and consume'*, such as public information campaigns in the Philippines or a restaurant scheme to encourage take away containers for leftover food in Belgium.

In the case of those voluntary measures addressing the question of *'what we produce and consume'* the overwhelming majority are centred around awareness raising campaigns and information dissemination. In Germany a national initiative makes strong links between sustainable diets and health, whereas in Jordan**Error! Reference source not found.** the government has ongoing campaigns to raise awareness on organic labelling among consumers. Some countries such as Belgium focus as well on the benefits of eating locally, which has the indirect link towards the external costs associated with long-haul transport, though this is not specifically mentioned in the policy.

Being voluntary, the obvious caveat to these measures is that they are not enforceable and rely on the ensemble of consumers in order to be effective. Increasing the amount of (enforceable) measures upstream, at the processing stage for example, would in effect guide the downstream choices of consumers.

III. Activities of the One Planet network: Key trends, gaps and opportunities

The One Planet network reporting 2013-2019 collected 2,379 activities across the One Planet network. Of these, 401 activities related to food were retained for analysis. This analysis was further complemented by a qualitative analysis of 116 projects on food that are showcased on One Planet network website.

Activities addressing natural resource use and environmental impacts along the food value chain are diverse in nature, including the kinds of interventions and the kinds of organisations implementing. While the One Planet network features one programme that is focused on sustainable food systems, projects being undertaken on food are by no means restricted to this programme. All six One Planet network programmes have reported activities related to food. The most represented is the Sustainable Food Systems (SFS) programme; however, the Sustainable Lifestyles and Education programme (SLE), the Sustainable Tourism Programme (STP) and the Consumer Information (CI) each have a significant number of activities related to food.
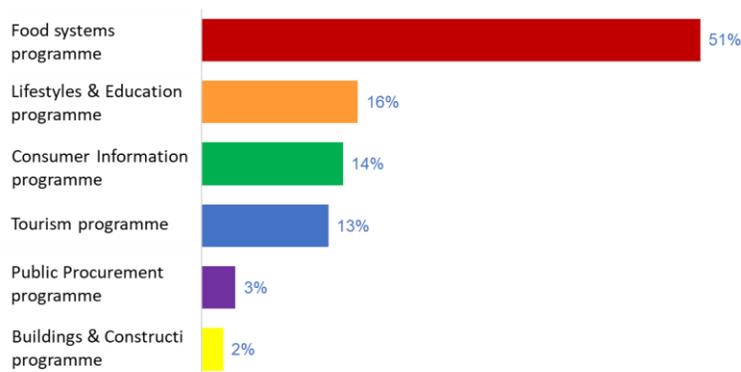

Figure 3: Activities related to food in the six programmes of the One Planet network

All geographical regions, except the Middle East, are covered by the activities from the One Planet network addressing the food value chain. The largest number of activities (26%) were global in their scope, often in the form of tools or resources developed that could be applied anywhere, or otherwise activities implemented by international organisations such as the UN Environment Programme (UNEP) and the Food and Agricultural Organisation of the United Nations (FAO). 23% of reported activities were focused the African region, with the

majority (40%) of activities in this region targeting primary production. Europe and Central Asia, Asia-Pacific and Latin America and the Caribbean all account of approximately 15% of the activities.

Activities across the One Planet network addressing the food value chain have been implemented largely by civil society organisations (36%), followed by international organisations (27%). Civil society works evenly across all stages of the food value chain, though with less emphasis on food processing (only 3 activities out of 185) and no reported activities on disposal, transport and input industry. Meanwhile international organisations are dominant working at the government and whole value chain level. Research institutions are focused on addressing primary production (35%) and businesses focus primarily on the food service stage (37%).

The activities of the One Planet network were analysed in relation to 1) the stage of the value chain primarily targeted, 2) the programme under which this activity is undertaken, and 3) the challenge they primarily address (how we produce, how much we produce and consume, what we produce and consume).

Overview and key messages

The middle stages of the value chain are underrepresented
One Planet network activities related to food were mapped in relation to the stage of the value chain that they target. Figure 4 provides a percentual overview. Most activities of the network take place at primary production (23%) or individual consumption (19%) stages. There is also a significant portion of activities that address the food value chain holistically.
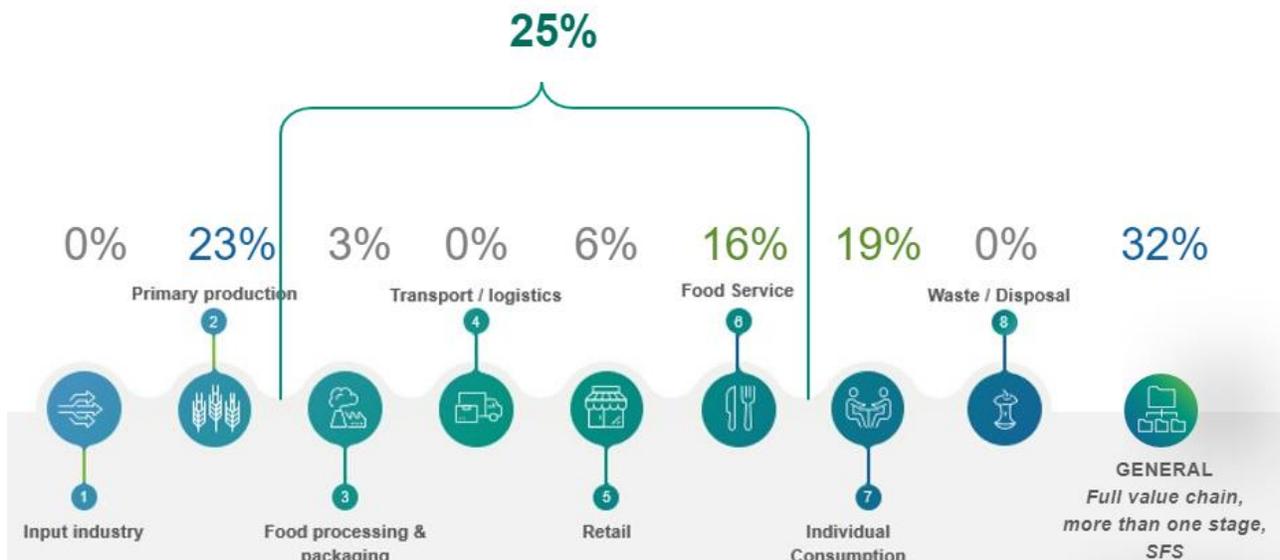

Figure 4: Overview of activities related to food across the One Planet network in relation to the stage of the value chain that they target

The middle stages of the food value chain, including food processing and packaging, transport and logistics, retail and food service, are identified in the food value chain analysis as playing a powerful role in shaping both production and consumption. Activities at these four stages combined represent only 25% of the total, being underrepresented despite making up a significant portion of the food value chain in terms of size, influence and structural power. A significant amount of activities within this 'middle part' of the food value chain can be seen at the Food Service stage. This is driven by a large number of activities of the tourism sector to address food sustainability.

The activities of the programmes are complementary

The Sustainable Food Systems programme's primarily holistic approach is well complemented by the activities of the other programmes at specific stages of the value chain. Figure 5 provides a visual representation of these dynamics, which include:
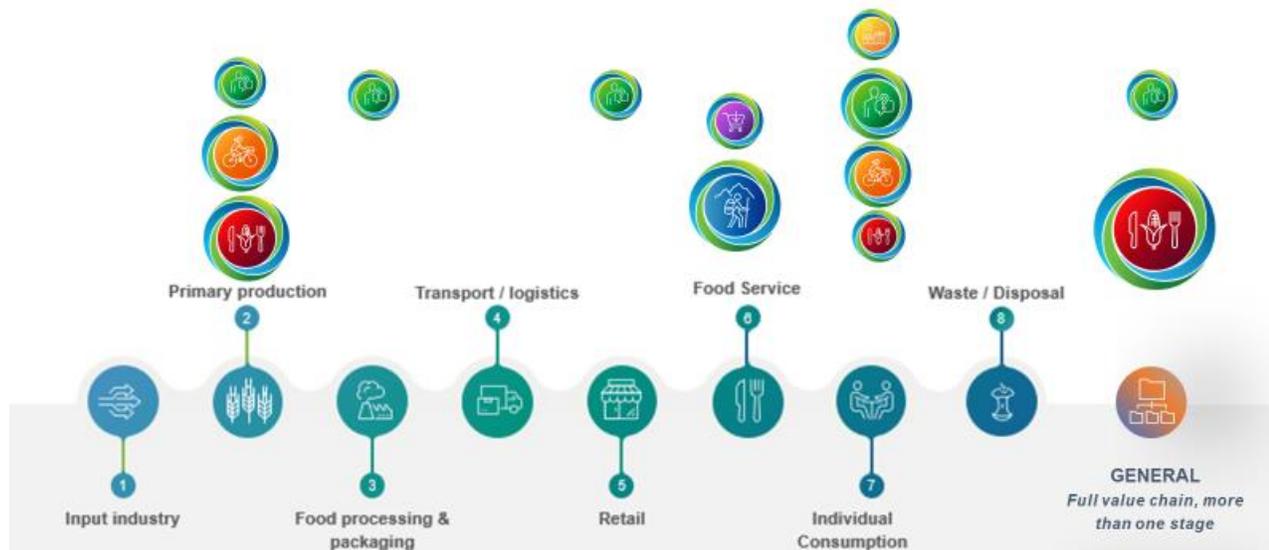

Figure 5: Overview of activities of the programmes in relation to the stages of the food value chain (Legend – Red: Sustainable Food Systems; Green: Consumer Information; Blue: Sustainable Tourism; Orange: Sustainable Lifestyles and Education; Yellow: Sustainable Buildings and Construction; Purple: Sustainable Public Procurement. Size of the dots is proportional to the volume of activities)

- The Sustainable Food Systems programme dominates the holistic level and upstream stages. More than half of the programme's activities (55%) take a whole-of-value-chain approach or address multiple stages simultaneously. This reflects the focus and conceptualised prioritisation of the SFS programme on 'systems'. In terms of value chain stages, the programme dominates the upstream stages of the food value chain, with a majority of their activities at the primary production stage (22%).

- The Consumer Information programme connects the middle stages of the value chain to production and consumption. The programme's activities on the development and application of standards, certifications and labels for food are featured in over half the stages of the food value chain. They serve as an example of the systemic nature of value chains, and how the activities at one stage of the value chain can have an impact at other stages. At the primary production stage of the food value chain, these standards, certifications and labels for food translate into changes in farming and fishing practices to use fewer natural resources and cause fewer environmental impacts. At the individual consumption stage, they provide individual consumers with information they need to allow them to make more sustainable food choices, as well as ensuring that consumers have sustainable choices available to them. At the food processing, retail and food service stages of the food value chain, they illustrate how food companies can apply and implement standards, certifications and labels for food to the products they procure, produce, sell and serve, demonstrating the important way in which the operations of 'middle stages' of the value chain can influence both production and consumption.

- The Sustainable Tourism Programme dominates the food service stage of the value chain. The food products that tourism companies choose to source and serve to their guests, and the ways in which this food is served and managed, can have a strong influence on natural resource use and environmental impact along food value chains. Many activities at this level see tourism companies choosing to procure food locally and seasonally, to apply standards, labels and criteria on their food procurement, as well as undertaking steps to address food loss and waste. Activities that address the food service stage related to projects led both by major global hotel chains, as well as by small-scale individual tourism providers.
- Sustainable Public Procurement programme influences governments. Through applying sustainable public procurement practices, governments put in place policies and programmes to ensure all food purchased by the state meets certain sustainability criteria, helping to shift practices to be more sustainable. Governments, such as Ethiopia, are applying sustainable public procurement to support the livelihoods of smallholder farmers through school feeding programmes that connect farmers with local schools to provide the produce for school lunches, simultaneously improving student nutrition and providing smallholders farmers with market opportunities.

Each of the three food challenges presents opportunities to build upon

The three challenges across food value chains were addressed relatively equally across all the activities, with between 18-27% of activities addressing either how, how much, or what we produce and consume. While the majority of activities addressed one main challenge of the three, there are 36% of the activities where two or three of the challenges were addressed simultaneously (Figure 6).

The challenge of 'how we produce food' is addressed mostly through activities that support changes at the primary production stage, complemented by some activities along other stages of the food value chain. These additional activities at other stages acknowledge the systemic nature of the food value chain and demonstrate that interventions at different stages can have an influence on how food is produced at the primary production stage. Prominently, activities at the retail stage of the value chain, mostly related to standards, certification and labels of food products, illustrate how retailers constitute a key interface between producers and consumers. The criteria that these actors use to select what to put on their shelves, and to build the 'food environment' in which individual consumers make decisions around food, can in turn influence the natural resource use and environmental impacts along the whole food value chain.

'What type of food we produce and consume' is mostly being addressed at food service and individual consumption stages. For food service, this is primarily around providing menus sourced from local and seasonal produce. For individuals, this is about shifting diets to also feature more local and seasonal produce, as well as shifting away from meat consumption and toward plant-based alternatives. There are little or no activities at food processing and retail stages of the value chain, despite highly-processed foods having a much larger resource and environmental footprint and contributing to lifestyle diseases.

The challenge of 'how much food we produce and consume' presents an opportunity for a stronger coordination of activities. This challenge is mostly being addressed at the food service and the individual consumption stages of the value chain through the proliferation of different projects and activities addressing food waste, presenting an opportunity to consolidate efforts through collaborating and sharing experiences and results with a view to replicating best practice. At the retail stage of the food value chain, most activities focus on reducing food loss and waste at retail, without considering the influence that retail can have on this upstream with farmers and downstream with consumers. There is an opportunity for retail to play a stronger role in adjusting operations at the retail stage to positively reshape consumer behaviour to prevent food loss and waste, as well as to raise awareness and educate consumers on the issue and help influence them to make better decisions.
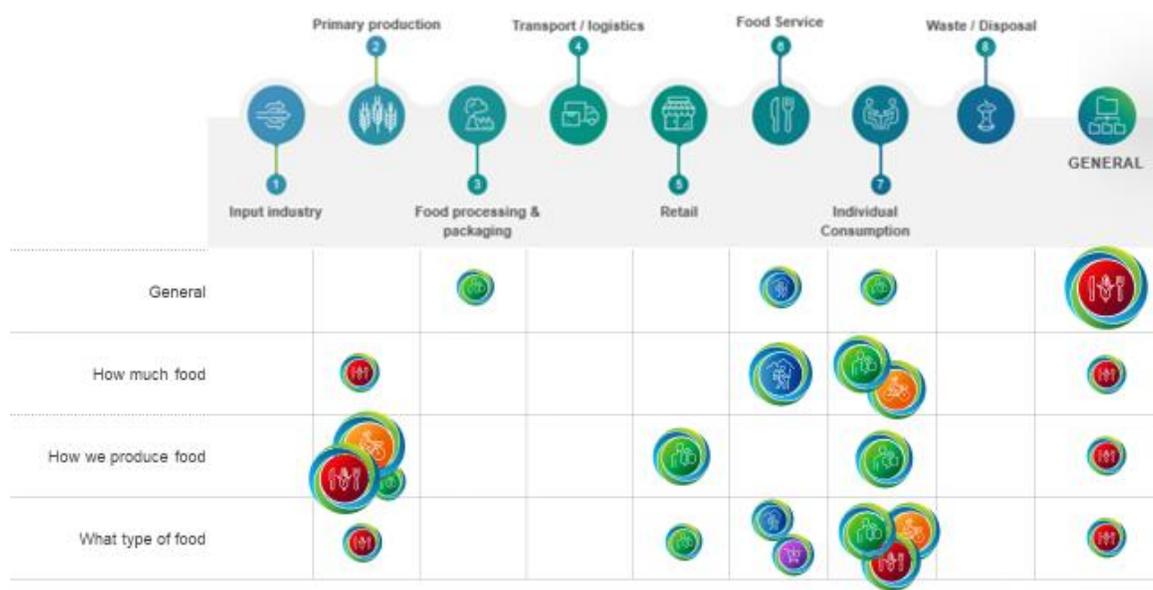
Figure 6: Overview of activities of the programmes in relation to which challenge they primarily address and at which stage of the food value chain (Legend – Red: Sustainable Food Systems; Green: Consumer Information; Blue: Sustainable Tourism; Orange: Sustainable Lifestyles and Education; Yellow: Sustainable Buildings and Construction; Purple: Sustainable Public Procurement. Size of the dots is proportional to the volume of activities)

Analysing activities of the One Planet network along the value chain

1. Input industry & Primary production

The primary production stage of the food value chain is where the majority of natural resource and environmental impacts occur. Addressing the key challenge of 'how we produce food' through changing primary production practices is therefore critical to reducing natural resource degradation and depletion as well as environmental impacts in food value chains. It is at this stage that most of the activities of the network take place (23%), largely driven by activities under the Sustainable Food Systems programme and projects under the Sustainable Lifestyles and Education programme.

The Sustainable Food Systems programme is addressing the challenges of 'how we produce food' and 'what type of food we produce and consume', while the Sustainable Lifestyles and Education programme focuses mainly on 'how we produce food'. Some features of the sustainable agriculture practices reported include increasing diversity of crops, reducing and improving the efficiency of the inputs that go into farming (e.g. fertilisers and pesticides), increasing soil health and fertility, and addressing climate change adaptation and mitigation.

Sustainability in the production processes is facilitated through access to databases and mobile applications, such as a tool offering pesticide risk databases and algorithms. Also, through trainings in particular to smallholder farmers to increase their capacity in addressing sustainability in their primary production processes, such as training Cocoa farmers in Ghana on biodiversity management and farmer groups in Zimbabwe on value chain development, market engagement and conservation agriculture. In addition, certifications and standards guide farmers in applying sustainable practices in primary production, such as green certifications in the dairy sector in

Sri Lanka, as well as toolboxes for practitioners to establish and operate guarantee systems and adhere to standards and certifications.

2. Processing & Packaging, Transport

Within the middle stages of the food value chain the food processing and packaging stage has been identified as having a particular importance to influencing natural resource use and environmental impacts along the food value chain, also in terms of value add and employment. Yet this is one of the least represented stages among activities in the One Planet network, comprising only 3% of total activities.

These activities are mainly related to the Consumer Information programme and revolve around the application of standards, certifications and labels for food product sustainability. Tools and resources available at this stage of the food value chain include a practitioner's guide for innovative markets, evaluation tools to assess the sustainability of mass consumption products, a guidance on eco-innovation, and trainings on food standards, criteria and sourcing.
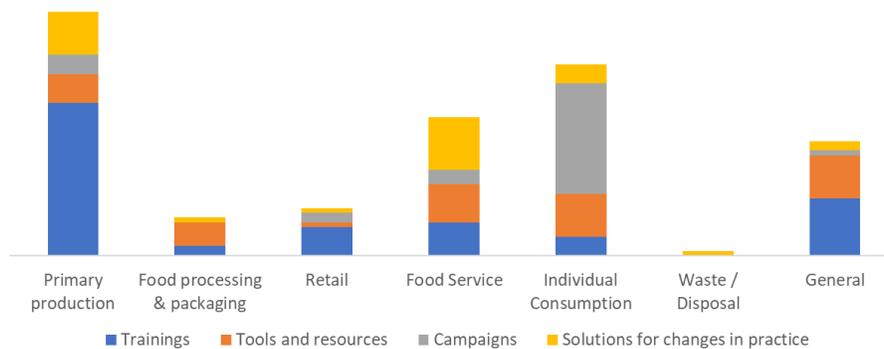

Figure 6: Overview of the types of tools and solutions available across the One Planet network in relation to the stage of the food value chain they target.

3. Retail & Food Service

Retail is a key interface between producers and consumers. The standards and contracts that retail and food processing companies put in place for their suppliers, either directly from farmers or indirectly from upstream food companies, can have a significant influence on the ways in which food is produced and the natural resource use and environmental impacts that occur at the primary production stage. Equally, retail stores can be influential in shaping individual consumption patterns and encouraging consumers to shift to more sustainable diets. Despite the pivotal connection between both food production by farmers and food consumption by individuals, this is an underrepresented stage among the activities in the One Planet network, with only 6% of the total activities. These activities are mainly related to the Consumer Information programme, addressing the challenge 'how we produce food' and to some extent 'what type of food we produce and consume'.

A significant amount of activities within the middle stages of the food value chain can be seen at the Food Service stage, constituting 16% of the total activities. This is driven by a large number of activities under the Sustainable Tourism programme focusing on the challenge of 'how much food we produce and consume', with some activities also addressing the challenge of 'what type of food we produce and consume'. For example, tourism businesses implement measures to reduce food waste, such as smaller plate sizes or guest awareness activities, as well as initiatives to implement sustainable menus and the offering of plant-based menu items. Efforts to address the challenge of 'what type of food we produce and consume' are complemented by some activities by the Sustainable

Public Procurement programme, in particular reflecting the role of governments to shape what type of food is sourced for food provision within public services.

In terms of the tools and solutions available at these stages of the food value chain, a new set of guidelines lays the ground for effective product sustainability information to consumers, addressing actors both at the retail and food services stages, and linking to the individual consumption stage. The guidelines include a comprehensive set of high-level principles for users to follow, and guidance on how to apply them, covering fundamental and aspirational approaches that can be applied in developed and developing countries, and by companies of all sizes. The guidelines are accompanied by a set of trainings, case studies and by an online self-assessment tool. Other tools and resources focus on procurement, sourcing and food waste prevention, for instance focusing on sustainable sourcing of seafood in South Africa, on capacity building activities for waste reduction at hotels, and on capacity development for policy implementation of sustainable public food programmes.

Solutions to implement concrete changes in practices addressing the retail (3%) and food service (38%) stages make up a total of 41% of reported changes in practices. Within the food service stage, these cover the implementation of procurement policies, food waste reduction programmes and sustainable waste management practices.

4. Individual consumption

A large portion of the network's activities take place at the individual consumption stage, 19% of the total. These activities are related to the Consumer Information, the Sustainable Lifestyles and Education, and the Sustainable Food Systems programmes. They focus mainly on 'what type of food we produce and consume', while also addressing the other two challenges of 'how much food we produce and consume' and to a lesser extent 'how we produce food'; with 45%, 24% and 12% of the activities at this stage respectively.

70% of the communication campaigns connected to food are targeted at consumers and constitute the bulk of the activities under this stage of the food value chain. The campaigns address food waste, sustainable and healthy diets, food security, local and urban agriculture, and consumption of local produce. Campaigns include engaging consumers through the Good Food 4 All run in the EU, urban agriculture in Pakistan, promotion of sustainable food choices and food waste prevention in the UK, encouraging a sharing economy with agricultural produce in Kenya, and seed sharing in Malaysia.

In addition, existing tools and resources tackle consumer habits through learning, information on sustainable diets and responsible consumption, and mobile applications, such as MyFoodways and eco-label guides. Concrete solutions to changing consumer practices addresses sustainability in lifestyles, including giving consumers access to trustworthy sustainability information through SmartLabel.

IV. Conclusions

The mapping of policies and activities on food across the One Planet network highlight a number of broad trends, opportunities and gaps emerge.

The policy analysis provides a general picture of the landscape at the policy level and of the related opportunities and gaps in terms of enabling conditions. The overall trends that emerge include:

- **Measures are primarily concentrated at primary production and individual consumption level.** This also highlights a gap in measures at the middle stages of the value chain, the stages that shape how we produce and how and what we consume.
- A good mix of voluntary (e.g. awareness, training, guidance) and regulatory measures (e.g. directives, quotas, mandatory procedures) exist at various stages of the value chain; while **economic and financial measures remain more limited**, such as the removal of harmful subsidies.
- **A relative balance between the key challenges that the policy measures address**, indicating that overall there is not a large gap in terms of policies which look at production processes, food loss and waste, and the types of food being produced and consumed. A better understanding of how the different stages of the value chain interact with one another in addressing these challenges is however missing.
- There are **opportunities to scale up measures highlighted on procurement regulations**, as they can play a key role in supporting sustainability practices along the food value chain (for example by simultaneously promoting local sustainable products and healthy diets) but are currently proposed on a small scale rather than nationwide

Future efforts should be made to address the current lack of attention paid to the largest and most influential players in food-related policies. Measures at food processing stage of the value chain are largely absent from the majority policies and the measures at the retail and food service stages are mostly voluntary and tend not to target the most influential operations with large market share.

In the meantime, existing activities and resources are key to operationalise voluntary measures put forward in policies and beyond. The activities of the One Planet network on food provide an indication of where key activities and resources, that can be leveraged to address identified hotspots and challenges, can be found. While acknowledging that the One Planet network activities remain a limited dataset in a global context, a number of broad trends, opportunities and gaps emerge. These include:

- While the middle stages of the food value chain remain underrepresented in the activities of the One Planet network, there are **key opportunities to build on the work undertaken at food processing, retail and food services stages** by various programmes and actors of the One Planet network.
- Activities on the development and application of standards, certifications and labels for food are taking place at food processing, retail and individual consumption stages of the value chain. Food processing and retail are a key interface between producers and consumers: what retailers choose to put on their shelves and how they operate can in turn influence the natural resource use and environmental impacts along the whole food value chain. **While effective sustainability information to consumers seems to be well understood, there is an opportunity to further understand how labels and standards influence primary production**.
- **There are opportunities to scale-up and expand activities taking place at the food service stage of the value chain.** Activities at this stage are mostly in the tourism sector and primarily focused on providing menus sourced from local and seasonal produce or on reducing food waste. There are opportunities to expand the focus to include considerations regarding animal-based food products or highly-processed food productions. There are also opportunities to replicate the work of tourism companies to other actors including food companies and retail in producing and providing sustainable food options.
- **A consolidation of progress on food loss and waste at the individual consumption and food service stages would reduce the risk of duplicating efforts.** Replicating existing initiatives and best practices will highly benefit from collaboration and sharing experiences and results.
- **Procurement regulations have been identified as a key entry point and the Sustainable Public Procurement programme is working with governments to shape publicly provided food services.** However, to a large degree, procurement of food takes place from one business to another and there remains a gap for food

processing companies, retail and food service companies. Beyond the already active tourism companies, private food service includes fast food restaurants and other major restaurant chains, as well as individual food service, hospitality SMEs and micro-enterprises.

Annex I: List of policies analysed

Belgium (Bruxelles) - Strategie good food « vers un système alimentaire durable en région de bruxelles-capitale

Belgium – Lutte contre les pertes et gaspillages alimentaires

Belgium (Flanders) - Declaration of commitment: Together against food losses

Chile - Plan de Acción Nacional de Consumo y Producción Sustentables 2017 - 2022

Costa Rica - Política Nacional de Producción y Consumo Sostenibles 2018 -2030

Costa Rica - Estrategia nacional para la sustitucion de plasticos de un uso

Costa Rica - Programa Nacional de Etiquetado Ambiental y de Eficiencia Energética de Costa Rica y creación del comité técnico de etiquetado ambiental y energético

Cote d'Ivoire - decret portant creation et fixation des modalites d'attribution « l'ecolabel cote d'ivoire

Ecuador - Plan Nacional de Desarrollo 2017-2021-Toda una Vida

European Union – Directive of the European Parliament on the reduction of the impact of certain plastics on the environment

European Union – Farm to Fork Strategy

Finland – Getting more from less

France – 50 mesures pour une économie 100% circulaire

Germany – National Strategy for Food Waste Reduction

Germany - National Programme on Sustainable Consumption

Jordan - National strategy and action plan for sustainable consumption and production

Namibia - National Solid Waste Management Strategy

Norway – Food Loss and Waste in Fish Value Chains

Norway – Industry agreement on reduction of food waste

Pakistan - Pakistan National Action Plan on SDG 12 Sustainable Consumption and Production

Philippines - An act providing for the development and promotion of organic agriculture in the philippines and for other purposes

Saint Lucia - Styrofoam and Plastic Food Service Containers 2019 (Prohibition) Act

South Africa – Industrial Policy Action Plan

Sweden - A National Food Strategy for Sweden

Tunisia - Plan d'action national sur les modes de production et de consommation durables

United States - U.S. EPA Sustainable Materials Management Program Strategic Plan