



**SOLVING THE GREAT FOOD PUZZLE:
THE NETHERLANDS - FOOD SYSTEM TYPE 5**

CONTEXT

This country report on the Netherlands is part of the *Solving the Great Food Puzzle* series, which explores the place-based nature of food system transformation around the world. *Solving the Great Food Puzzle* assesses the potential impact of 20 transformation levers across several countries using in-country expert analysis, and provides guidance on which levers experts believe can have the highest impact. At the heart of *Solving the Great Food Puzzle* is our belief that only through a place-based approach that focuses on actions that will have the greatest impact in the shortest time possible, will we be able to win the high-stakes race to solving global problems.

For more information, please see the main report [here](#).

KEY FINDINGS FOR THE NETHERLANDS

1. Sentiment is overwhelmingly poor that action on food system transformation is on track to achieve climate, biodiversity and health goals by 2030; experts believe that large gaps exist in ambition, strategy and implementation.
2. Most initiatives for improving food systems focus on production, followed by food loss and waste and, lastly, dietary change.
3. Out of 20 transformation levers, coordinating and strengthening national-level commitments is ranked as the highest potential impact lever.
4. Three of the top 10 transformation levers involve finance (i.e. redirect subsidies and increase de-risking investments, provide incentives and taxes on consumption, finance school food and procurement programs), and there is strong science to support their use.
5. Natural resource management levers, such as optimizing land use, are ranked as the second highest impact lever category.
6. Education and knowledge is ranked as a lower impact lever category when compared to other countries most likely because awareness of the problems is already relatively high.
7. There is strong support in the Netherlands for the promotion and development of alternative protein sources as well as production and consumption of plant protein sources such as legumes and pulses.
8. There is moderate support* for prioritizing the development of nature-positive supply chains most likely because there already is a long history of support for this issue, including deforestation-free supply chains.
9. The Netherlands shares a learning cohort together with Type 4 and Type 6 countries.**
10. Several landscapes in the Netherlands are considered food system hotspot areas and face threats from food production.

* See main report: In addition, Type 5 countries have a history of using deforestation- and conversion-free regulations to help promote the consumption of deforestation-free products. This includes the proposed EU Regulation 2023/1115 on deforestation-free products.

** See main report for description of Food System Types and Figure 6 for variable differences between Food System Types.

OVERVIEW

The Netherlands is a high-income, small, densely populated country located in northwestern Europe, with a low elevation and flat topography. The country is home to about 36,000 native animal species, of which 500 are protected by European law. The country has limited levels of carbon reserves given most of the land is under cultivation (only 15% is conserved as nature), and peat meadows act as the main carbon stores but are threatened by intensive dairy farming and low groundwater levels.¹

Food security is high and most of the Dutch population consume a predominantly animal-based diet (60% animal proteins). Over-consumption and high consumption of ultra-processed foods has led to high rates of overweight (>50% population) and obesity. The Netherlands is the second largest exporter of agricultural commodities in the world, many of which are agricultural imports re-exported directly or after adding value through mixing, repacking or processing. Despite being a net exporter of food, current domestic consumption patterns have resulted in the need to import 75% of foods that require four times the land area of the Netherlands to produce (including re-exports).² Even with a shift in diets to a [Planet-Based Diet](#), the Dutch still lack sufficient land area to support domestic consumption of food.

The Dutch farming system is very intensive and is characterized by high livestock intensity resulting in high levels of pollution of waterways, soils and air, including the ongoing deterioration of protected nature areas (Natura2000) as a result of surplus deposition of nitrogen. High livestock intensity has also led to high levels of animal feed imports, often related to deforestation and land conversion in countries around the world, especially in South America.³

The Netherlands has signed most UN agreements and has developed Nationally Determined Contributions (NDCs: Klimaatakkoord 2019),⁴ and National Biodiversity Strategies and Action Plans (NBSAPs) (in the process of updating).⁵ However, the Netherlands has not developed a National Food Systems Pathway following the UN Food System Summit. Although some mentions of food systems are included in both the NDCs and NBSAPs, specific mention of food system approaches remains weak. Additionally, most mentions of food systems in targets are related to production, while food loss and waste and diets and nutrition are left out.



MIND THE GAPS

In this study, we asked experts (Appendix tables A2.4, A2.5, A2.6 in main report) whether their country was on track for achieving food system transformation (Figure 1) and to assess their country's progress in closing three transformation gaps: *ambition*, *strategy* and *implementation* (Figure 2). Please see the Solving the Great Food Puzzle main study for more details on each gap. In addition, we asked experts if a food systems approach was being used in their country (Figure 3). Overwhelmingly, experts in the Netherlands were negative about their country's progress on food system transformation, felt large transformation gaps exist, and didn't feel that a food systems approach was being used. See Appendix 2 in the main report for methodology used in this study.

Expert sentiment on food system transformation

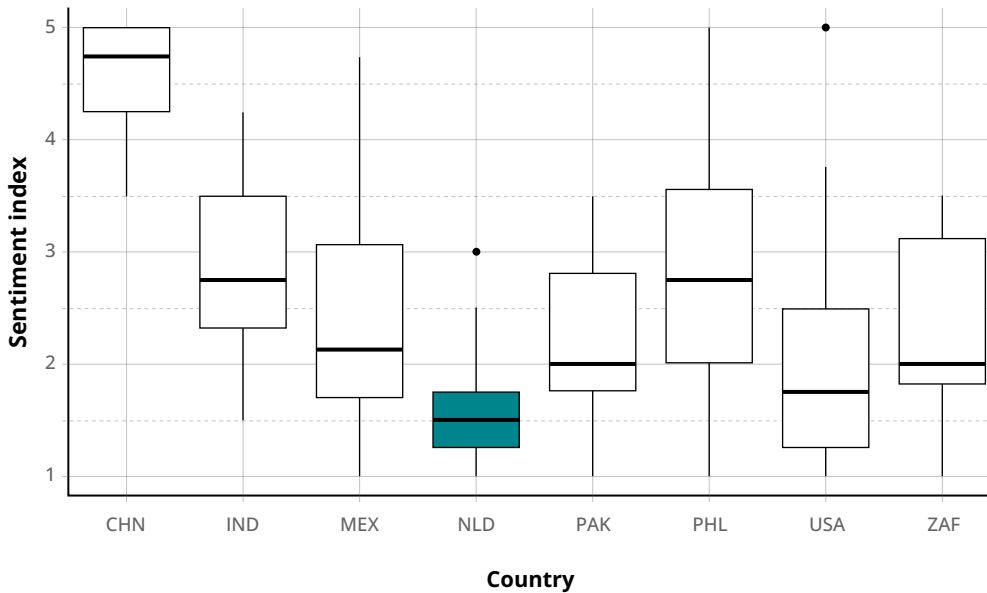


Figure 1.

The Netherlands ranked the lowest among countries assessed on expert sentiment on progress on food system transformation.

Confidence in current initiatives

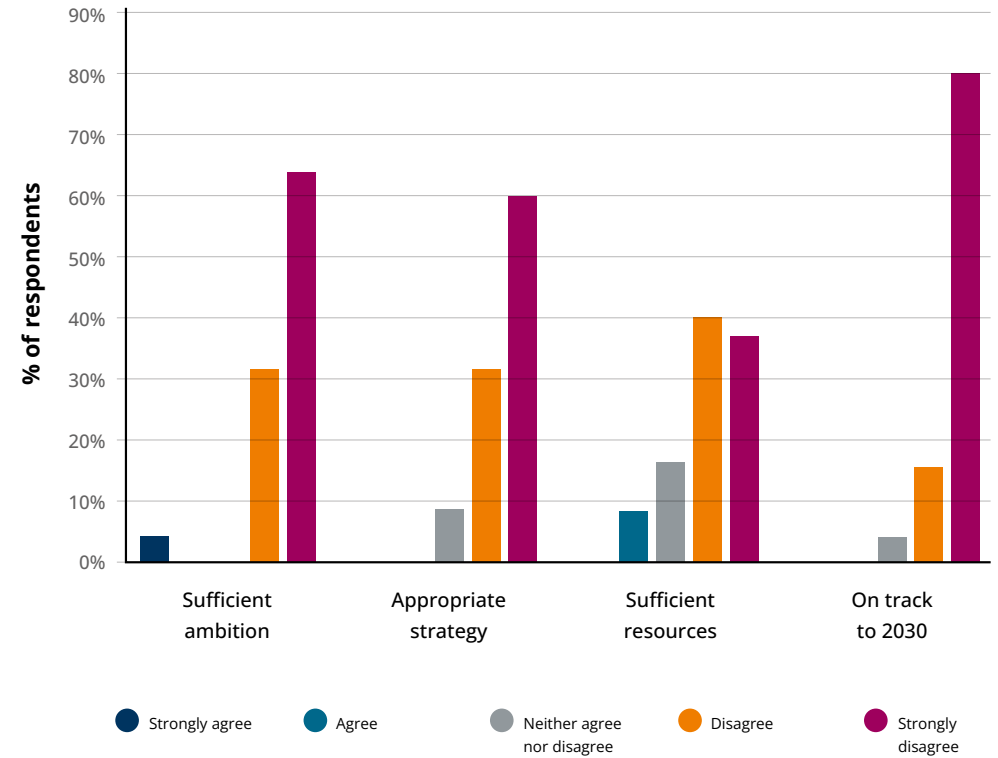


Figure 2.

Experts in the Netherlands overwhelmingly feel that large gaps exist in ambition, strategy, and implementation and that the country is not on track for achieving health and environmental goals.

Food system transformation goal areas

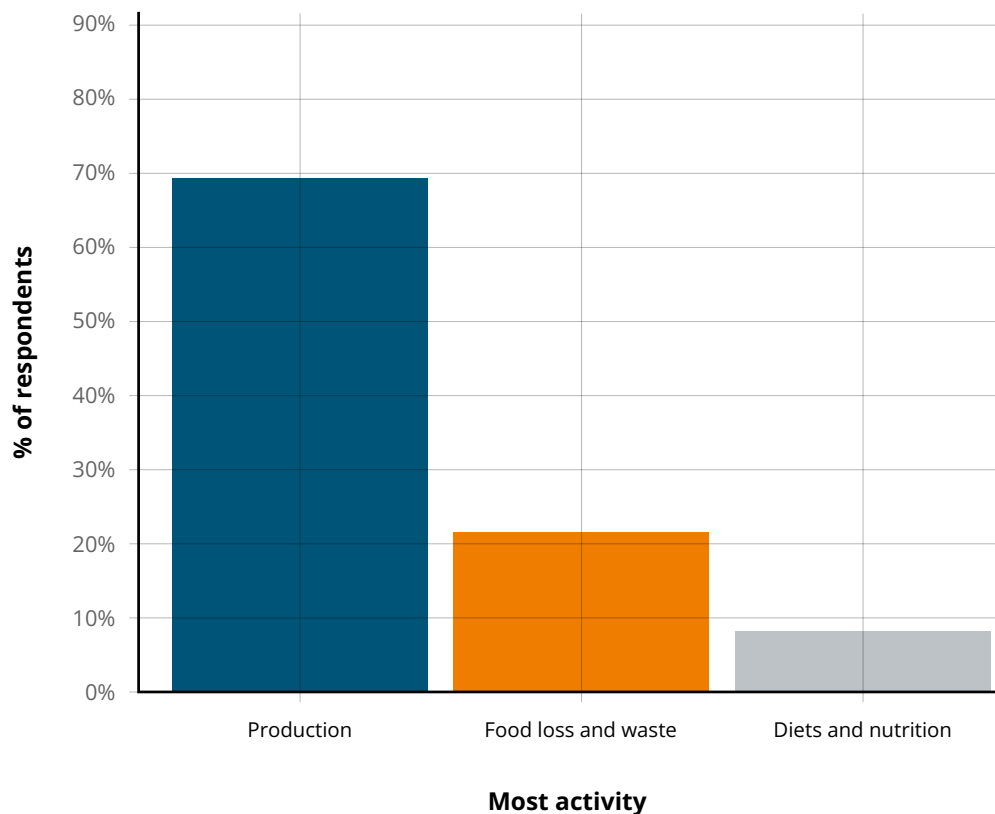


Figure 3.

Experts in the Netherlands felt that most efforts in food system transformation focused on production and much less on food loss and waste and diets.

CLOSING THE GAPS

Large gaps were identified in ambition, strategies and implementation, and there is an urgent need to close these gaps in the Netherlands to achieve food system transformation. Twenty transformation levers (see Table 4 in *Solving the Great Food Puzzle* main study) have been identified through a review of the literature and expert consultations, which can help to close these gaps. All 20 levers will have some transformation potential and could be important for national-level food system transformation and used by a variety of stakeholders in decision making (e.g. policymakers, businesses, funders, NGOs). However, unless significant resources are available to invest in full implementation of all levers to varying degrees, a means of assessing the potential impact of individual levers in a particular Food System Type can be useful for decision makers.

The potential for impact of these levers (scored 1 to 5) varies by country depending on the particular social and environmental conditions of each country (i.e. Food System Type - Figure 4). The Netherlands is a Food System Type 5, which is described in more detail in Table 1. Results for all 20 levers for the Netherlands can be seen in Table 2.



Global Distribution of Food System Types

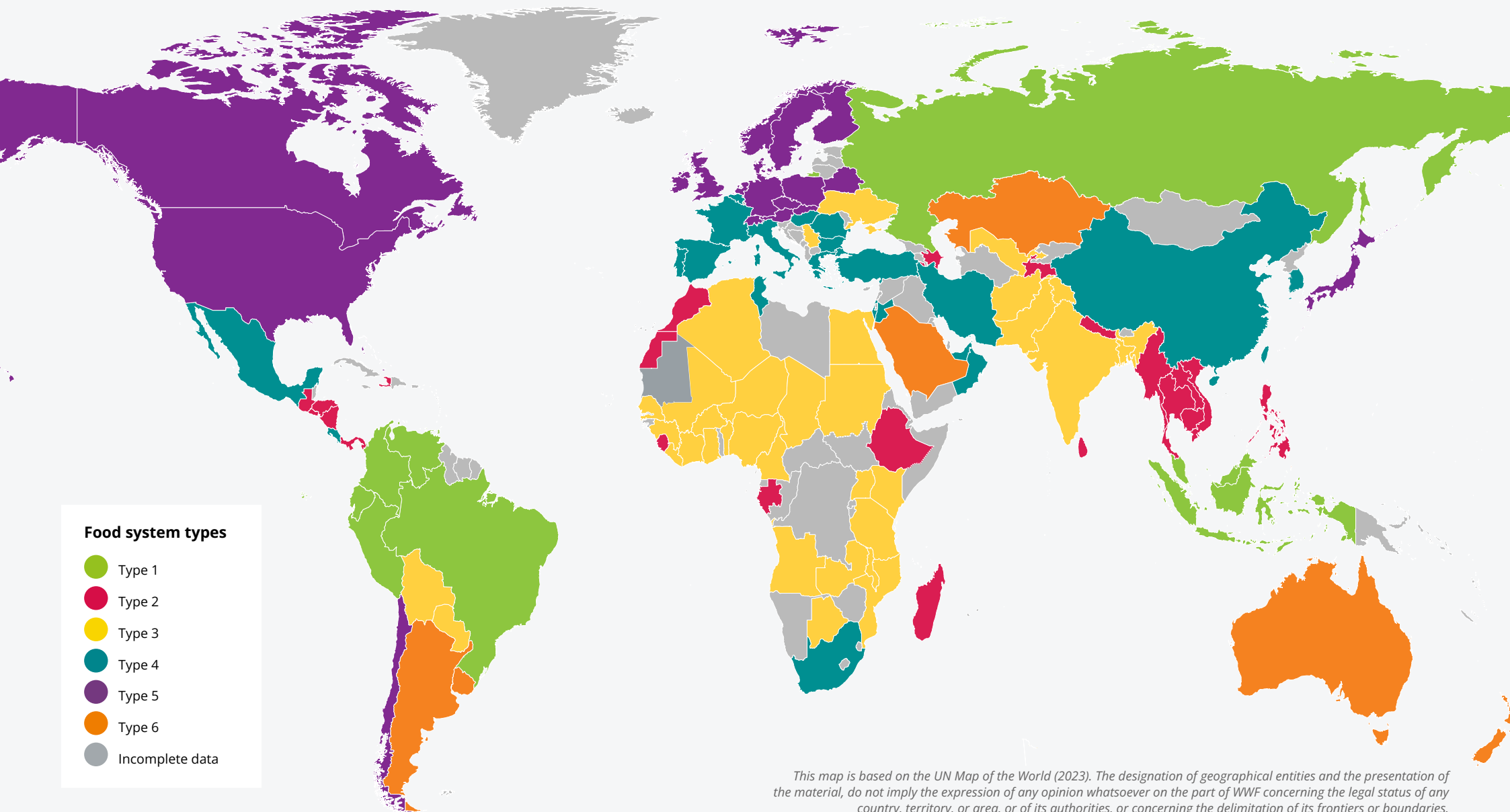


Figure 4.

Global distribution of the six Food System Types (1-6) identified in this study based on the variables from Table 1 in Solving the Great Food Puzzle main report. The Netherlands is a Food System **Type 5**.

Table 1.
Description of and country examples for Food System Type 5.

Food System Type	Country examples	Description
5	Chile, Japan, Netherlands, Norway, United Kingdom, United States	Countries that have lower concentrations of biodiversity hotspots but quite high concentrations of irrecoverable carbon. When coupled with stronger levels of environmental performance, this puts natural areas at low risk for conversion. Industrialized agriculture dominates food production. These countries have enough land and water resources to produce food for domestic demand for a Planet-Based Diet. Food security is high.

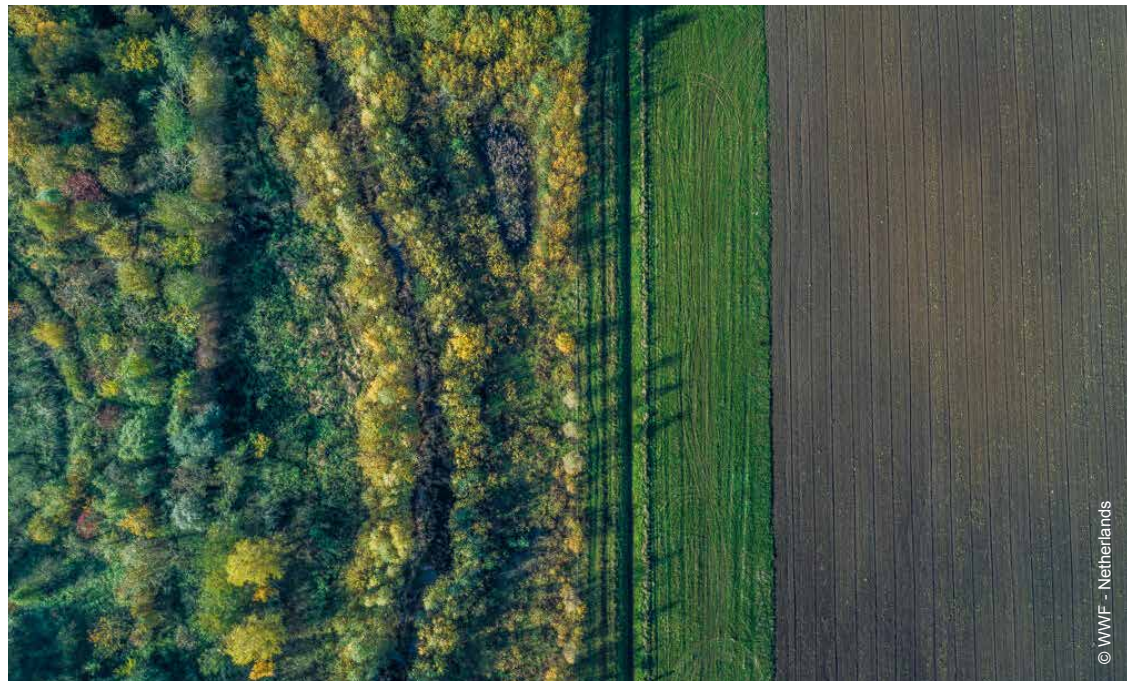





Table 2.
The potential of individual transformation levers to transform the food system in the Netherlands are ranked from higher (dark green) to lower (light green) potential.


Strategic action areas	Lever abbreviations	Transformation lever definitions	Transformational potential
Natural resource management	Optimize land use (NRM1)	Use all agricultural lands to their maximum potential including using existing agricultural land to feed humans and optimize crop yields on those lands through better food production practices that more efficiently use water and fertilisers, reduce pollution from chemical inputs, preserve ecosystem functions and contribute to resilient landscapes.	
	Restore Biodiversity (NRM2)	Develop and implement food production practices that restore biodiversity in active food producing lands/waters and restore less productive areas to natural habitat for biodiversity conservation.	
	Increase carbon storage (NRM3)	Develop and implement food production and blue foods management practices that increase carbon stores in below and above ground biomass and blue carbon.	
	Increase food and agri-diversity (NRM4)	Support the production and consumption of a diversity of terrestrial and aquatic foods and protein sources (e.g. legumes, nuts and nutri cereals) through agrobiodiverse systems including agroecology and regenerative agriculture.	
Governance	Support smallholders (GOV1)	Redesign development and extension programs to all farmers/fishers, including women, to provide financial assistance, develop new business models, infrastructure and agricultural assets to grow/catch nutritious and sustainable traditional foods and access markets.	
	Improve land tenure rights (GOV2)	Improve land tenure rights and develop actions that encourage ownership and indigenous land rights.	
	Strengthen commitments and implementation (GOV3)	Coordinate and strengthen national-level commitments and implementation on shifting to healthy diets, reducing food loss and waste and scaling nature positive food production.	
	Foster multi-stakeholder collaboration (GOV4)	Support multi-stakeholder collaboration using multi-level and participatory approach for addressing interrelated issues across economic, social and environmental dimensions.	
Education and knowledge	Strengthen science, research and development (ED1)	Strengthen the science of healthy and sustainable food production and increase research and development opportunities with food producers, and domestic universities, to expand nature-positive food production practices that support production of healthy foods.	
	Improve data collection and measurement (ED2)	Improve data collection and measurement of current behaviours, environmental impacts and progress of national-level commitments contributing to international health, climate and biodiversity targets.	
	Increase public awareness (ED3)	Launch engaging and compelling communication behaviour change campaigns about healthy and sustainable eating and reducing food loss and waste.	
	Promote healthy, sustainable and traditional foods (ED4)	Promote healthy, sustainable and traditional food cultures associated with good nutrition by supporting and protecting healthy and traditional foods and protein sources (e.g. legumes, nuts and nutri-cereals), providing information about healthy and traditional dishes and protein sources and through public awareness campaigns.	


Strategic action areas	Lever abbreviations	Transformation lever definitions	Transformational potential
Technology	Adopt high-tech methods (TECH1)	Adopt high-tech, nature-positive food production methods such as the sustainable use of non-conventional water sources and controlled environments for food production, and precision and digital agriculture technologies.	
	Develop supply chain infrastructure (TECH2)	Develop supply chain infrastructure (e.g. roads and transport systems) and post-harvest storage technologies, packaging and processing techniques for nutritious foods to reduce food loss and waste.	
	Develop alternative proteins (TECH3)	Develop and promote healthy alternative protein sources such as plant-based and cell-based meat alternatives that are high in nutritional value.	
Trade	Support healthy food imports and exports (TRD1)	Design trade policies to prioritize the supply of nutritious foods over those that have large negative impacts for the environment and human health.	
	Develop nature-positive supply chains (TRD2)	Develop trade policies (e.g. deforestation- and conversion-free) that support nature-positive food production, such as trade agreements and traceability tools and changes in markets.	
Finance	Redirect subsidies and increase de-risking investments (FIN1)	Redirect agri-foods subsidies and from staple crops and harmful production practices and increase de-risking investments to increase nature-positive production of nutritious foods.	
	Finance school food and public procurement programmes (FIN)	Finance school and public procurement programmes that promote and enable healthy and sustainable foods.	
	Provide financial incentives and taxes to improve consumption (FIN3)	Use true-cost accounting and other financial mechanisms to increase the availability, affordability and appeal of nutritious foods and make foods with high negative impacts for the environment and human health more expensive.	

 **Lower** potential of lever to transform a particular Food System Type

 **Medium to lower** potential of lever to transform a particular Food System Type

 **Medium** potential of lever to transform a particular Food System Type

 **Medium to higher** potential of lever to transform a particular Food System Type

 **Higher potential** of lever to transform a particular Food System Type

To help assist policymakers with prioritization of these levers, we asked experts to rank the top 10 levers from the survey data. Of the 20 levers, the top 10 highest ranked levers in the Netherlands can be seen in Table 3.

Table 3.
The 10 highest ranked transformation levers by experts in The Netherlands.

Ranking	Transformation Lever	
1	GOV3	Strengthen commitments and implementation
2	FIN1	Redirect subsidies and increase de-risking investments
3	NRM2	Restore biodiversity
4	FIN3	Provide financial incentives and taxes to improve consumption
5	FIN2	Finance school food and public procurement programs
6	NRM4	Increase food and agri-diversity
7	ED3	Increase public awareness
8	TECH3	Develop alternative proteins
9	TRD1	Support healthy food imports and exports
10	ED2	Improve data collection and measurement





I was quite positive about the EU's farm to fork agenda. It had its flaws, and was heavily skewed to the production side because that's where the EU has most of its competencies. But at least it was the first time in which the EU developed a comprehensive food systems agenda. Typically, a more siloed approach is used to agricultural policy, food safety and climate goals. So this was the first move towards something that you could call a common food policy for the EU. But over the last year, this agenda has largely been derailed



IMPORTANT TAKEAWAYS

COORDINATING AND STRENGTHENING NATIONAL-LEVEL COMMITMENTS IS THE HIGHEST POTENTIAL IMPACT LEVER IN THE NETHERLANDS:

At the top of the list is the need to raise national-level commitments to healthy, sustainable diets, reducing food loss and waste, and nature-positive food production. However, a key challenge in the Netherlands is the reluctance on the part of the government to take leadership and set explicit targets for food transformation (i.e. large ambition gap). Increased collaboration among private and public sector actors are critical because noteworthy changes like transitions to plant-forward diets, reducing the use of fertilizers, and increasing consumption of alternative proteins can all be unpopular and politicized in ways that stalls meaningful change. The failure of not getting the national 'agriculture agreement' in 2023 was frequently mentioned.

THREE OF THE TOP 10 LEVERS ARE IN THE FINANCE LEVER CATEGORY:

Levers related to subsidies and incentives were highlighted as particularly relevant to prioritize in the Netherlands. Redirecting subsidies from harmful to nature-positive practices (FIN1) was ranked as the second highest potential impact lever, while two consumer-facing financial levers – making healthy food more affordable and accessible (FIN3) and financing public procurement programs and support healthy and sustainable food (FIN2) – were ranked third and fourth. This finding highlights that food systems thinking, from farm to fork, appears to be high in the Netherlands.

We can all have great ideas and plans to change the food system. But if farmers switch to nature-positive farming practices, but then they are not able to get premium prices for their products, then the push for nature-positive farming will fail. So priorities 1, 2 and 3 are market development, market development and market development.

Supermarkets play an important role in both the price setting for farmers and consumers and the setting of sustainability standards.

It is really sad that the agrifood system in the Netherlands at this moment seems so stuck in its old ways. Because if you look at it from the positive side, it would be fantastically positioned to become a global leader in how to build a sustainable food system. Showing what it takes to combine agro-ecological, regenerative or organic practices. The Netherlands could match up extensive farming practices with technological innovations that work with nature and help farmers to work with ecological systems and all of the biodiversity that is there, instead of trying to kill it, or trying to control it, but to really work with it. That would be a really great way forward.

NATURAL RESOURCE MANAGEMENT LEVERS ARE THE SECOND HIGHEST IMPACT STRATEGIC ACTION AREA:

In a context with low potential for marginal efficiency gains in production, there is a strong need to support the production of a diversity of foods through agro-ecological, regenerative, or organic practices (NRM4) and combining these practices with technological innovations that allow for limited use of labour. Progress in improving nature-positive food systems has stalled, and there is a need for a stronger focus on reducing nitrogen, greenhouse gases, and particulate matter emissions and livestock production. At the same time, restoration of biodiversity also appears at the top of potential impact levers highlighted by experts (NRM2).

STRONG SUPPORT FOR THE PROMOTION OF PLANT PROTEINS AND DEVELOPMENT OF ALTERNATIVE PROTEIN SOURCES:

More than any other country, the need to address diets and consumption was ranked as particularly high in the Netherlands, which is the only country that includes the development of alternative proteins (TECH3) in its top 10 high-impact levers. Firstly, efforts should concentrate on increasing the consumption of plant-based protein, with the goal of reaching a 60/40 plant and animal-based protein consumption ratio by 2030. However, consumers need to be supported in this transition, or instance, through clear labelling and legislation to support sustainable choices. In addition, compelling and engaging behaviour change campaigns (ED3) are needed, along with financial incentives that increase the availability, affordability and appeal of nutritious foods and make foods with high negative impacts for the environment and human health more expensive (FIN3). Although to-date there has been lack of progress on the protein transition, largely due to lack of political will to promote dietary changes, the protein transition is starting to move from polarization to partnership, with companies in meat, fish and dairy industries and start-ups in the plant-based alternatives stepping in to accelerate the transition. Experts also noted that in parallel to work on dietary shifts, efforts are also needed to raise awareness on food waste.

“

We know what needs to happen, and the conclusions of every new report comes back to what we eat. We need to eat less meat and a little bit less dairy. And we need to eat more legumes or pulses, and the science to support these conclusions is clear.

I think there's consensus among experts on what we need to eat. Anyone who works professionally with the food system, especially on the consumption side, agrees that [alternative proteins] are needed.

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LEARNING COHORTS

Food systems are complex, and global or country-level data can only get us so far when trying to make sense of that complexity. *The Great Food Puzzle* typology reduces some of this complexity by clustering countries with similar social and environmental variables (see Table 1 in the *Solving the Great Food Puzzle* main study). And yet, even with these clusters, the place-based nature of food systems challenges still makes it difficult to say, with certainty, that an action lever that will have a transformative effect in one country will have the same effect in another country of the same Food System Type.

Given this, in addition to the quantitative data used to develop the Food System Types, we also need to lean into the contextual knowledge of experts, who can apply that knowledge to think about key actions in the context of local food systems and their histories, politics and culture. There are also opportunities for experts from different countries to learn from each other. By looking not just at the objective data classifications of food systems but also looking for patterns in expert rankings of various action levers, we can identify learning cohorts – pairs or clusters of countries that may benefit from learning from one another’s experiences (Table 4).



Table 4.

Learning cohorts divided by Food System Type. Learning cohorts are groups of countries whose Food System Types are similar where there may be opportunities for learning and collaboration around solutions for food system transformation. The Netherlands is grouped into learning cohorts 4 and 5.

Food System Types					
Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Learning Cohort 1					
	Learning Cohort 2				
		Learning Cohort 3			
			Learning Cohort 4		
				Learning Cohort 5	

FOOD SYSTEM HOTSPOTS

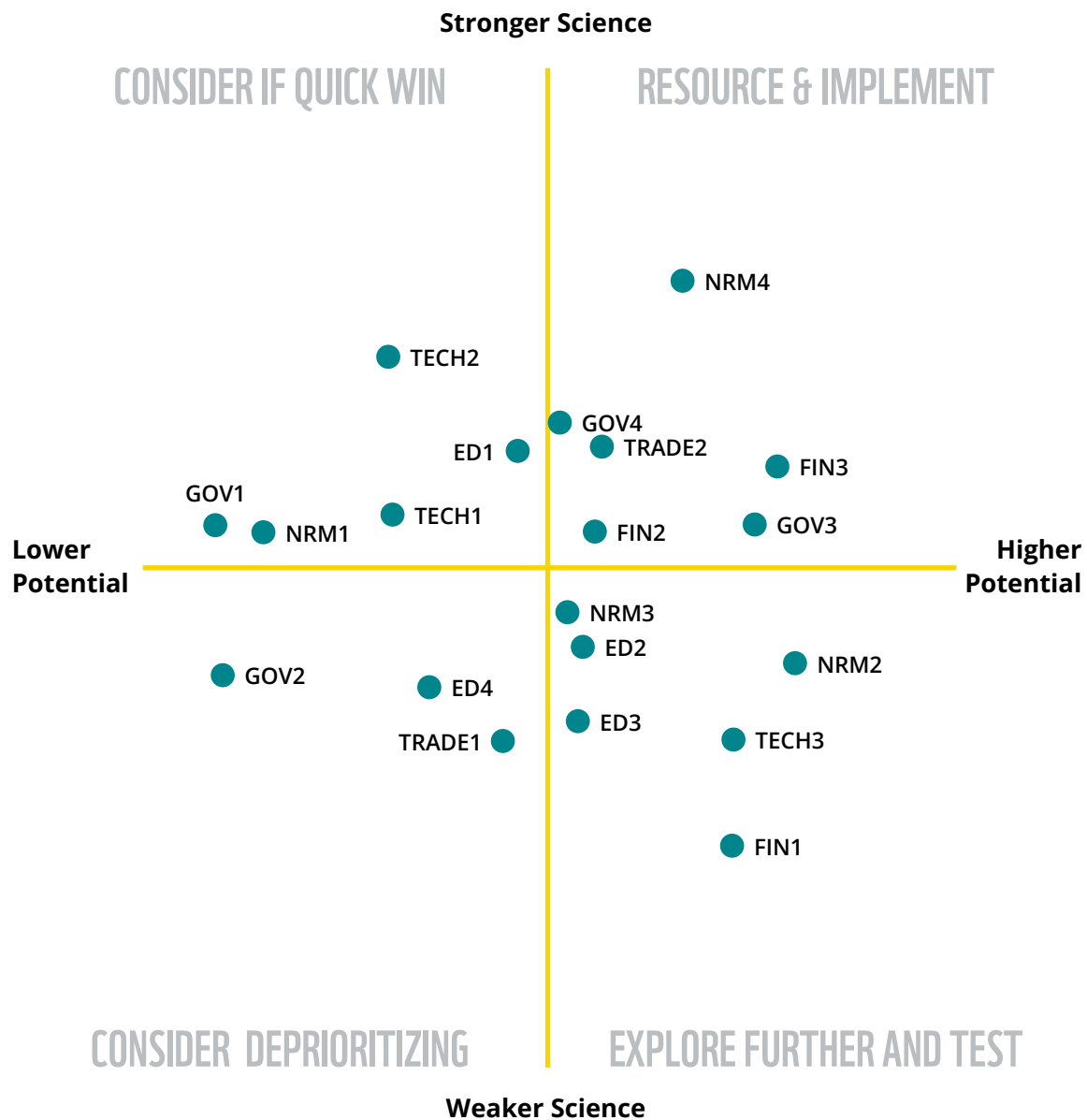
A food system hotspot is a landscape that is blessed with some of the richest reservoirs of carbon, plant and animal life on earth but also threatened by food systems. The Netherlands contains a few landscapes listed as food system hotspots including the Netherlands delta and North Sea wetland areas and agricultural landscapes themselves. These are hotspots given their high levels of biodiversity richness and high impacts mainly from excessive nitrogen pollution from food production. See Figure 7 and Table 3 in *Solving the Great Food Puzzle* for more detail on food system hotspots.

PRIORITIZING CHANGE: POTENTIAL FOR IMPACT AND THE EVIDENCE BASE

Ideally, the actions to be taken to promote food system transformation will be those, given the urgency, that have the greatest impact in the shortest time possible (i.e. closing the strategy gap). This objective lies at the heart of *Solving the Great Food Puzzle*. In addition, these actions should be well vetted and based on robust experimental and experiential data in support of their use. However, food systems are highly contextual and the world is changing quickly and often traditional science is either not available or given immediate challenges, actions need to be taken despite significant uncertainty. Hence, part of the goal with this phase of *Solving the Great Food Puzzle* study was to gauge with Dutch experts their perceptions on the strength of the science behind the 20 transformation levers. Figure 5 shows the relationship between the potential impact of the 20 transformation levers and the strength of the science to support these levers. Levers in the upper right-hand quadrant, **in theory**, have the highest potential for impact and the stronger science in support of their use.

CLOSING THE STRATEGY GAP

The strategy gap refers to whether the **actions** and **innovations** currently in place to achieve climate, biodiversity and health policies are sufficiently optimal to create change fast enough given the urgency of the challenges at hand. In other words, even if sufficiently ambitious targets and goals have been set, and implementation sufficiently supported, these are irrelevant if the actions and innovations in place are not capable of achieving them.



NRM1	Optimize land use
NRM2	Restore biodiversity
NRM3	Increase carbon storage
NRM4	Increase food and agri-diversity
GOV1	Support smallholders
GOV2	Improve land tenure rights
GOV3	Strengthen commitments and implementation
GOV4	Foster multi-stakeholder collaboration
ED1	Strengthen science, research and development
ED2	Improve data collection and measurement
ED3	Increase public awareness
ED4	Promote healthy, sustainable and traditional foods
TECH1	Adopt high-tech methods
TECH2	Develop supply chain infrastructure
TECH3	Develop alternative proteins
TRD1	Support healthy food imports and exports
TRD2	Develop nature-positive supply chains
FIN1	Redirect subsidies and increase de-risking investments
FIN2	Finance school food and public procurement programs
FIN3	Provide financial incentives and taxes to improve consumption

Figure 5.
Prioritization of transformation levers based on impact and strength of the science.



I do not think that food systems transitions are delayed because of the strength of science. The main barriers are political in nature.

Consumption is still very much the elephant in the room. And we see that politically. It's still very much a taboo to touch upon anything that relates to food consumption.... Technical solutions have always been number one.

Not a lot of new science is needed. Other types of innovations such as agroecological or regenerative farming are needed. We don't need to know this for policy.

Innovation and progress are being equated with science. The real new knowledge is being generated more by entrepreneurs and not in universities. We should value the innovative power that is being grown at younger companies.

We need to match up extensive farming practices with the proper technological innovations that enhance these practices and work with nature. This would help farmers work with ecological systems and the biodiversity that is there, instead of trying to kill it or trying to control it.

One of the things that we are a bit concerned about is the circularity of the organic food system. We need to feed our livestock, particularly pigs and chickens in a much more circular way, and not only grow food organically for these animals. We also need supply chain and food loss and waste innovations that make it really circular because when people buy organic they expect a circular food system, which it's currently not.



Experts' perceptions regarding the strength of science in the Netherlands did not always agree with their rankings for the potential impact of the various levers. That is, there were cases where experts ranked levers higher for impact despite comparatively weak science scores. For example, in the Netherlands, five of the top 10 highest ranked transformation levers (Table 2 - NRM2, TECH3, FIN1, ED2, ED3) also scored as having weaker science in support of their use (Figure 5). On the other hand, four of the top 10 highest ranked transformation levers were scored as having stronger science behind them. These were finance school food and public procurement programs (FIN2), provide financial incentives and taxes to improve consumption (FIN3), strengthen commitments and implementation (GOV3), and increase food and agri-diversity (NRM4).

Interestingly, the research and development lever in the Netherlands was ranked as having lower impact (Table 2), in contrast to many other countries in the study. This could be explained by the fact that many Dutch experts interviewed expressed they felt that we already knew what needed to be done and that instead the challenge was in implementing what was already known.

Three levers in the Netherlands fell into the "Consider Deprioritizing" category. These were improving land tenure (GOV2), promoting traditional foods (ED4), and supporting healthy food imports and exports (TRD1).

In addition to identifying the actions that have the greatest impact in the shortest time possible, the other half of closing the strategy gap means pairing the highest impact transformation levers (Tables 2 and 3) with the right innovations to amplify and accelerate the impacts of that lever. It's likely that this will only be achieved by pursuing a suite of innovations that work together in different parts of the food system and society at large. This could be, for example, pairing consumer awareness on the need for a shift to healthy and sustainable diets, with a tax innovation that implements the true cost of animal-source foods. Please see Chapter 4 in *Solving the Great Food Puzzle* main report for more information.

CASE STUDY

A TRANSITION TOWARDS 60% PLANT-BASED PROTEIN IN DIETS

COUNTRY:

The Netherlands

LEVER:

Strengthen national level commitments

TYPE OF INNOVATION:

Policy, Social, Consumer



The Netherlands is a country with a dense livestock population, large imports of animal feed and high consumption of meat and dairy. Dutch consumers eat approximately 1.5 times more animal-based protein than plant-based protein, even though the Health Council of the Netherlands has stated that a diet comprising 60% plant-based protein is much healthier for most people and reduces the climate impact of diets by 25%. In 2020, the Dutch government launched a national strategy to achieve a 50-50 split between consumption of animal and plant-based protein by 2030.

To help implement this commitment, WWF-Netherlands is working with Albert Heijn, the biggest retailer in the Netherlands, towards an ambitious goal of 60 percent of protein-based revenue coming from plant-based products. Other retailers, including Jumbo and LIDL, the second and third largest retailers) have also adopted this goal. The Dutch Ministry of Agriculture, Nature and Food Quality has developed a dashboard that compares the percentage of plant-based protein offered by the five biggest supermarket chains. It is based on data captured by the Green Protein Alliance, of which WWF-Netherlands is a member.

To support local farmers in the transition toward higher consumption of plant-based proteins WWF-Netherlands joined the government and nearly 60 companies, institutes, retailers, NGOs, farmers in signing the Green Deal for Protein Rich Crops - known as the 'Bean Deal'. The deal aims to make the production of legumes and beans economically attractive for Dutch farmers. As part of this, WWF-Netherlands is conducting consumer engagement campaigns to increase demand and appetite for plant-based proteins, including by launching the Eating kindly with beans recipe book and supporting the national #BeanMeal campaign around World Pulses Day.

KEY LEARNINGS

- It isn't just what the consumer chooses to do that drives behaviour change - there has to be a supportive food environment, which involves government, retail and food companies.
- Monitoring data and making it publicly available can accelerate progress and ensures accountability

CASE STUDY

FOOD FORESTS THAT DON'T PIT AGRICULTURE AGAINST NATURE

COUNTRY:

The Netherlands

LEVER:

Restore biodiversity

TYPE OF INNOVATION:

Social



The Dutch farming system is highly specialized and largely homogenized. It is characterized by high intensity of livestock, resulting in high levels of pollution of waterways, soils and air, including the ongoing deterioration of protected nature areas (Natura 2000 areas) as a result of surplus nitrogen deposits. This creates several pressing environmental challenges, such as adapting to climate change, contributing to climate change mitigation, improving the quality and availability of freshwater, and supporting biodiversity recovery, particularly by stabilizing nitrogen cycles. These must only be only be addressed while also maintaining (or ideally improving) farmers' income.

One high-impact solution is to diversify production by creating 'food forests'. Agroforestry contributes to clean water, climate mitigation and adaptation, and, when implemented in buffer zones near waterways and undisturbed nature, it can contribute to biodiversity recovery. Food forests are working lands that provide yields to farmers, but maintain connectivity between natural areas, supporting biodiversity and movement of wildlife. WWF-Netherlands supports the Dutch Food Forest Foundation to implement large food forests, working with full-time farmers to establish or scale food forests on their land, providing training and helping them demonstrate their successes to other farmers in the region. At the same time, WWF-Netherlands is working with Wageningen University (WUR) to support research in the development of business models for agroforestry that improve farmers livelihoods and increase ecological connectivity.

With no heavy machinery being used, food forests in the Netherlands have achieved richer soils, leading to high levels of carbon sequestration and water retention. Six years after being established, food forests have recorded the same levels of biodiversity as Natura 2000 areas, in terms of diversity and numbers. After a start-up phase of several years, the food production of a planted food forest increases rapidly. Once matured, food forests have been shown to achieve net profit of €3500 per hectare per year, exclusively from the sale of food. This is much higher than the Dutch average for grains, silage and grassland. As Dutch food forests continue to proliferate, it is estimated that 170,000 hectares could produce enough calories, proteins, oils, vitamins, minerals and fibres to feed at least one million people, significantly easing the environmental pressures of the current intensive production model.

KEY LEARNING

Shifts in production practices will often take time to deliver results - it is important to build business models alongside technical guidance, to incentivize and support farmers as they transition from one model to another.



RECOMMENDATIONS:

HOW TO USE THIS REPORT

- Policymakers can use this report to develop a long-term vision, strong leadership, and a common, integrated food, nature and agriculture policy based on the highest impact levers. Results for the Netherlands show a priority for financial instruments such as redirecting subsidies, introducing incentives and taxes on consumption, and fostering strong national-level commitments.
- Businesses, banks and supermarkets can use this report to take the lead in food system transformation, especially given they are in a position to overcome the current food transformation stalemate, where citizens, businesses, government and NGOs are pointing at each other to be the first to take path-breaking steps. Banks can offer incentives for their clients, companies and farmers to encourage more ambitious actions on food system transformation, while supermarkets can introduce minimum sustainability standards and accelerate the protein transition through price and marketing policies.
- All stakeholders can use this report to increase collective action on the highest impact levers, especially on the protein transition. Stakeholders working on sustainable food systems can organize themselves into a stronger societal ‘middle field’ (as in the Transition Coalition Food, the BeanDeal or United against food waste). Experts from a Think Tank or State committee could help to stimulate the public debate, overcome polarization, and give important advice on how food systems can help to solve the nature crisis.

- NGOs can use this report to develop roadmaps for achieving a healthy and sustainable food system and reaching environmental targets for climate, nature, nitrogen and land use. NGOs can push big multinationals, feed companies and agri-food cooperatives, which are currently slowing down transitions toward more sustainable food systems. They can also support bottom-up movements for agro-ecology, food forests, community-supported agriculture, true pricing, short-chain initiatives and common land ownership.
- Individuals can use this report to advocate for the highest-impact levers, such as the promotion and development of pulses and alternative proteins. They can raise their voices in the democratic arena of governments, provinces, water boards and municipalities, and vote each day with their fork and wallet by supporting the most sustainable supermarkets, products, banks, farmers and initiatives.

SIX STEP APPROACH FOR OPERATIONALIZING THE GREAT FOOD PUZZLE

Operationalizing the *Great Food Puzzle* can be done at various scales, including the country or landscape levels. Figure 6 outlines the steps that should be considered when using the *Great Food Puzzle* at either the country or landscape level. These steps will work for a wide range of stakeholders, from policymakers to business to civil society organisations and funders.

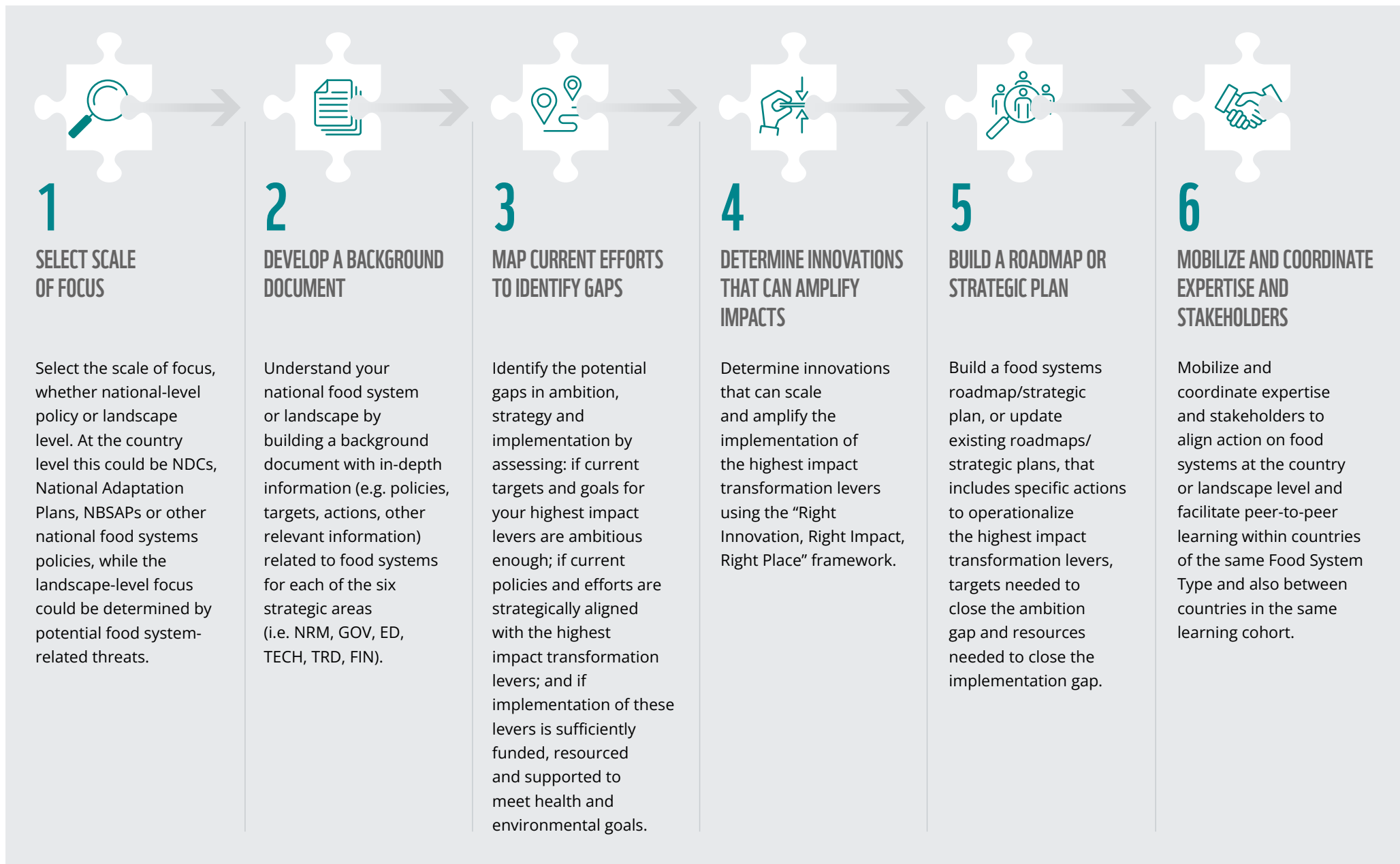


Figure 6.

A six-step approach to operationalizing the Great Food Puzzle either at the country level or at the landscape level.

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**THE GREAT FOOD PUZZLE REDUCES THE COMPLEXITY
OF FOOD SYSTEM TRANSFORMATION BY OFFERING
PLACE-BASED SOLUTIONS TO HELP SCALE NATIONAL ACTION.**

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