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Tools and methods to support the design and implementation of policies for agrifood systems transformation

A handbook for policymakers



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Preface

Agrifood systems serve many purposes ranging from producing food and agricultural goods to supporting livelihoods, protecting ecosystems and contributing to health equity and economic growth.¹ They are central to sustainable development but are constrained by policy and institutional arrangements that remain fragmented, sector-specific and ill-equipped to address the interconnected challenges of food and nutrition security, climate change and persistent poverty and inequality.¹

They are also a major source of employment and income, particularly for women and young people, making their transformation critical not only for food security but also for inclusive economic development. Agrifood systems account for a substantial share of total employment: 53.4 percent in Africa and 35.2 percent in Asia, compared with 17.9 percent in the Americas, 13.5 percent in Oceania and 11.2 percent in Europe.² Women represented 28.5 percent of the global agricultural workforce in 2022,³ but in regions such as West Africa they accounted for a much higher share, exceeding 80 percent in some value chains, leading functions related to production, trading and processing.⁴ Estimates also indicate that 44 percent of working youth rely on agrifood systems for employment.⁵

Despite their vital contribution to livelihoods and employment, especially in developing countries, agrifood systems face mounting pressures, including increasing greenhouse gas emissions, loss of biodiversity and persistent food insecurity.⁶ These challenges are becoming increasingly acute in the face of increasing conflicts, climate change and rising inequalities. The global COVID-19 pandemic also served as a reminder of the fragility and resilience of agrifood systems, highlighting their essential role in maintaining food supplies while adapting to changing contexts.⁷

These pressures are compounded by complex interconnections across sectors, disciplines, borders and institutions, shaped by shifting socioeconomic, environmental and political factors. This highlights one of the central challenges facing agrifood systems: while the problems are increasingly interconnected, the policies and governance arrangements designed to address them often remain fragmented and sector-specific. As a result, opportunities to generate synergies, manage trade-offs and deliver on multiple economic, social and environmental outcomes can be missed.¹

Governments increasingly recognize that achieving food security, climate resilience, improved nutrition and inclusive economic development requires a systems approach. The challenge is no longer understanding why a systems approach is needed, but how to operationalize it through stronger analytical tools, institutional capacities and coordination mechanisms that support policy coherence across sectors and stakeholders.¹

In response to the growing demand for guidance on operationalizing a systems approach, this Handbook provides policymakers with the tools and methods needed to improve the design and implementation of agrifood systems policies. Drawing on FAO's seminal publication *Transforming Food and Agriculture through a Systems Approach*,¹ the Handbook, in the form of training modules, aims to strengthen policymakers' capacities to improve policy coherence, mobilize innovation and investment, and accelerate agrifood systems transformation.

Glossary

Agrifood systems. “Agrifood systems encompass the journey of food from farm to table – including how it is grown, fished, harvested, processed, packaged, transported, distributed, traded, purchased, prepared, consumed, disposed of and reused. They also include non-food products that support livelihoods, and all the people, activities, investments and decisions involved in delivering these food and agricultural products.”¹ “In the FAO Constitution, the term ‘agriculture’ and its derivatives include fisheries, marine products, forestry and primary forestry products.”⁸

Agrifood systems transformation. “The deliberate and ongoing process of changing how agrifood systems function towards the sustained improvement of multiple interconnected outcomes at scale ... including through enhancing agricultural productivity, nutrition and health, environmental sustainability, inclusive economic growth and livelihoods, and reduced inequalities.”¹

Agro-industrial policies. Agro-industrial policies (including government policies, strategies and regulations) are designed to influence the structure of an economy, often by providing support to selected agro-industries or value chains with the goal of enhancing their competitiveness (adapted from Baker *et al.*⁹ and OECD¹⁰).

Capacity. “The ability of people, organizations and society as a whole to manage their affairs successfully.”¹¹

Capacity development. “Capacity development is the process whereby people, organisations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time.”¹²

Collaboration (in policymaking). Collaboration goes beyond coordination. It involves not only aligning policies, but actively engaging across institutional boundaries to co-develop solutions, share knowledge and resources, and implement interventions in a concerted and strategic manner. Whether through meetings, information sharing or joint activities, the goal of collaboration is to promote mutual learning, strengthen inter-organizational trust, build ownership of reforms and find common ground on shared objectives (adapted from Ansell and Gash,¹³ Hinds *et al.*¹⁴ and Peters¹⁵).

Coordination (in policymaking). Coordination ensures that diverse actors and sectors – each with their own mandates, programmatic priorities and investments – are working in alignment toward shared goals. Even as different parts of the system operate independently (e.g. agriculture, health, trade and environment), coordination ensures their efforts are complementary and mutually reinforcing (adapted from Ansell and Gash,¹³ Hinds *et al.*¹⁴ and Peters¹⁵).

Directionality/shared direction. Directionality refers to bringing together multiple stakeholders – including the public sector, civil society and the private sector – to collectively define a shared direction for change based on common challenges such as climate change and food insecurity (adapted from Kugelberg *et al.*¹⁶ and Parks¹⁷).

Experimentation (in policy). Experimentation relates to testing solutions or interventions on a smaller scale before committing fully, making it possible to learn and adapt without risking large-scale failure. This approach minimizes risk, builds evidence and supports buy-in from stakeholders, making it easier to implement systemic changes over time (adapted from Ansell and Bartenberger,¹⁸ Nesta,¹⁹ Sanderson,²⁰ and Sabel and Zeitlin²¹).

Facilitator (in the context of this Handbook). A professional who supports governments in strengthening policymaking through advisory, training, and capacity development roles. Facilitators may include public policy consultants (e.g. those engaged with FAO, the UN and partner agencies), policy officers in partner organizations, and agrifood systems experts who act as bridges between technical knowledge and decision-making.

Leverage points. Points within complex systems where a small shift in one area can produce larger changes in multiple areas.²²

Multistakeholder collaboration or engagement. A governance structure or process that brings together diverse stakeholders to focus on a specific problem or priority, combining resources and perspectives from different groups (government, private sector, academia, non-governmental organizations and communities). Multistakeholder collaboration enhances credibility, ownership and the relevance of policy outcomes (adapted from Ansell and Gash,¹³ Bryson, 2004,²³ and UNEP, FAO and UNDP²⁴).

Path dependency. A concept that explains how today's outcomes are shaped not only by current actions, but also by past policy decisions and investment patterns.²⁵

Pilot. A means of testing solutions or interventions on a small scale in a “real-world” setting to evaluate feasibility, effectiveness and potential challenges, serving as a final test before upscaling. Pilots can be considered more developed versions of prototypes (adapted from Nesta²⁶).

Policy coherence. Alignment of policies that affect the agrifood system with the aim of achieving health, environmental, social and economic goals, to ensure that policies designed to improve one agrifood system outcome do not undermine others.²⁷

Portfolio approach. The portfolio approach is a strategic management methodology that aligns diverse initiatives under a shared direction, coordinating policy instruments or projects for system-level impact, adapting through learning by doing and fostering innovation through safe-to-fail experimentation (adapted from UNDP²⁸).

Proof of concept. A Proof of concept demonstrates whether policy, part of a policy, innovation or technology is feasible and could work technically, legally or logistically. Proof of concept is usually focused on a specific narrow concept or technology and assesses if it can work through narrow testing or simulation (adapted from Nesta²⁶ and Tull²⁹).

Prototype. Early-stage experimental versions of tested proofs of concepts. They are typically carried out in controlled environments, and may include mock-ups, simulations or role-playing exercises to assess functionality and user experience (adapted from Nesta²⁶).

Strategic entry point. “A system element, relationship, or subsystem where targeted action can spark broader, lasting change across the system. A strategic entry point may also serve as a leverage point.”¹

Sustainable agrifood systems. “An agrifood system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised.”³⁰

System. “A set of interconnected components in dynamic interaction that deliver a number of outcomes” (derived from Estrada, 2024, in FAO¹).

Systems approach. “A method of solving problems and advancing solutions that considers the interconnections within and between systems to achieve sustained, systemic change at scale.”¹

Systems thinking. “A practice that focuses on understanding the dynamic interconnections within and between systems, recognizing that outcomes emerge from the interactions of interdependent components rather than from isolated, linear causes.”¹

Wicked/complex challenges. Issues that are difficult to define, that may be caused by several factors, and that often result in complex and interconnected consequences. Because of their cross-sectoral, evolving nature, they require different ways of thinking, acting and evaluating progress than single-sector policies (adapted from Rittel and Webber³¹).

Whole-of-government approach. A process where a government actively uses formal and/or informal networks across its different agencies to coordinate the design and implementation of a range of interventions to increase their effectiveness in achieving the designed objectives (OECD, cited in UN DESA³²).

Introduction – mapping the trajectory of agrifood policy development over the decades

Public policies have traditionally been designed and implemented within sector-specific institutional arrangements. Agrifood policymaking has been no exception, with policies affecting food, agriculture and related sectors often developed independently of one another.¹ As a result, policy outputs have frequently failed to reflect the interconnected nature of agrifood systems. Recognizing that fragmented policies cannot adequately address complex challenges, governments have, over the decades, gradually shifted towards a systems approach to agrifood policymaking.

During the 1950s and 1960s, agrifood policies remained largely sector-specific and focused primarily on increasing agricultural production. In the 1970s and 1980s, policymaking increasingly drew on farming systems research, which emphasized the role of small farms as integrated systems connecting crop and livestock production with household labour, food security and income generation.⁴⁴

The 1980s and the era of structural adjustment marked another shift in the agrifood policy context.³³ Reductions in the role of government in many countries, together with debt crises across many low- and middle-income countries, contributed to worsening food insecurity and declining incomes, particularly among vulnerable groups.^{34, 35} In this evolving policy context, the sustainable livelihoods approach became an important reference for agrifood policymakers in the 1990s.⁴⁶ This approach emphasized the central role of farming households and communities in economic and rural development, while recognizing environmental stewardship as an integral part of sustainable livelihoods.^{47, 44}

During the same period, landmark environmental and climate conferences elevated the role of the environment within international development and policy discourse. The 1992 Earth Summit helped catalyse global debates on the interconnections between climate, biodiversity, water and land⁴⁵. The World Food Summit followed in 1996, broadening the concept of food security beyond food availability to include food access, utilization, stability and nutrition. As a result, food security and nutrition policy frameworks became more closely aligned with agriculture, environment, health and social protection policies.⁵⁰

By the 2000s, agrifood policymaking had evolved further with the emergence of the agrifood value chain approach. This approach underscored the interconnected roles of value chain actors involved in the production, processing, trading, distribution, retail and investment of agrifood products, and how respective activities shape outcomes for producers, households, agrifood enterprises, markets and consumers.^{48, 49}

Increased investment in agrifood value chains has contributed to the expansion of global and regional markets for agrifood products in recent years.^{36, 38} At the same time, concerns have also risen over growing food loss and waste, environmental degradation³⁹ and worsening dietary health, particularly in high-income countries.⁴⁰ In 2022, agrifood systems emitted 16.2 billion tonnes of CO₂ equivalent, representing a 10 percent increase compared with 2000.⁴¹ Large-scale commercial agriculture also accounted for approximately 40 percent of forest loss between 2010 and 2015 in tropical and subtropical regions.⁴² Climate change further undermined livelihoods in many developing countries,⁴³ compounding persistent food insecurity.⁶

Growing acknowledgement that fragmented policy approaches are ill equipped to address these interconnected challenges strengthened calls for the integration of environmental sustainability into agrifood policymaking. Global initiatives such as Agenda 2030 and the Sustainable Development Goals, together with the annual Conferences of the Parties (COP) to the United Nations Framework Convention on Climate Change recognized the need for greater policy coherence across agriculture, climate change, biodiversity, land and water resources.

Collectively, these policy approaches have progressively broadened the scope of agrifood policymaking: from agricultural production, to farming systems, livelihoods, food security, value chains and environmental sustainability. While each has contributed to addressing interconnected challenges, they were generally implemented through separate policy processes and institutional arrangements. Nonetheless, together, these developments have contributed to valuable lessons on ways in which policy approaches can better integrate multiple objectives, sectors and stakeholders within coherent policymaking frameworks.

The [UN Food Systems Summit \(UNFSS\)](#) in 2021 marked an important milestone in this evolution. The Summit recognized the interconnected nature of agrifood systems and called for systems approaches capable of delivering economic, social and environmental outcomes simultaneously.

The growing application of systems approaches has also contributed to the emergence of programmes addressing specific cross-sectoral agendas. Examples of these agendas include [urban and territorial agrifood systems](#), [food loss and waste](#), [sustainable public food procurement](#), [agroecology](#), [One Health](#), [blue economy](#), the food/energy/water nexus and [climate-smart agriculture](#).

Although an increasing number of countries are adopting a systems approach in agrifood policymaking, institutional capacity gaps, competing policy agendas, limited resources and fragmented governance continue to constrain systems policy design and implementation. This has led governments to call on the United Nations (UN) and the development community to provide

technical support, practical tools and guidance, to help translate high-level commitments into accelerated agrifood systems policy implementation.⁵²

Developed in response to government demand for practical guidance, this Handbook aims to strengthen capacities for applying systems approaches in agrifood policymaking. It does so by presenting practical tools, methods and country examples that can be adapted to diverse national contexts. The Handbook is intended for policymakers and practitioners across government, the United Nations, national service providers and development partners involved in the design and implementation of agrifood policies. Specifically, this Handbook seeks to:

- build a shared understanding of systems approaches for improving policymaking by strengthening global and national knowledge of key concepts, principles and tools for analysing and navigating the complexity of agrifood systems;
- enhance capacities for integrated policy design and implementation by providing practical tools, methods and case examples that support governments and practitioners in developing coherent, evidence-based agrifood systems policies;
- guide government and non-government stakeholders to align innovation and investment strategies with agrifood systems priorities.

Methodology and target audience

This Handbook presents a selected set of analytically appraised and practice-informed public policy tools and approaches relevant to agrifood systems transformation. The theory underpinning the content is drawn from a range of literature covering food and agriculture, public policy design and agricultural innovation systems. The modules have also adapted materials shared by the [University College London's Institute for Innovation and Public Purpose \(UCL-IIPP\)](#) on systems-oriented policies. The relevance of these materials for agrifood systems was explored in collaboration with a cross-disciplinary team of FAO experts convened from across all regions for [a workshop](#) at FAO headquarters in Rome in October 2023.

A selection of these tools subsequently formed the basis of a training programme jointly delivered by FAO, UCL-IIPP and the University of Rwanda in Musanze, Rwanda, during November 2023. The training targeted policymakers and development practitioners involved in the design of the country's [Fifth Strategic Plan for Agriculture Transformation 2025–2030 \(PSTA5\)](#).⁵³

The [workshop in Rwanda](#) validated selected tools from the Handbook, with a group of policymakers from multiple sectors including agriculture, environment, health, trade and industry, and economic planning. This diverse participation allowed for discussion of the draft material from multiple perspectives, generating feedback on its practical application and relevance for policymaking. Rwanda was selected for this exercise because of its strong political commitment to agrifood systems transformation, demonstrated in national strategies including the Strategic Plan for Agriculture Transformation (PSTA5), and the country's emphasis on multisectoral collaboration.



Participants engage in group work during an FAO training workshop.

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Building on the findings from Rwanda, the concepts and tools were refined to better address the needs of public sector actors designing and overseeing the implementation of policies related to agrifood systems. The draft Handbook was then reviewed during a [training-of-trainers workshop](#) at FAO headquarters in December 2024, where FAO practitioners representing all regions engaged with the material and provided feedback on its application and relevance in their country contexts. Based on this feedback, the Handbook was finalized.

The curriculum in this Handbook was developed in response to government needs, with the aim of equipping public officials with the necessary tools to design and implement policies across institutional, local, regional and global levels. Given their central mandate for food and agricultural policy, the materials in the Handbook were designed to meet the needs of ministries of agriculture and food. The curriculum is equally relevant for other ministries that influence or are affected by agrifood systems policies, including environment, health, trade and industry, finance, digital transformation, infrastructure, economic planning, education and social development, among others. Engagement from multiple ministries in training sessions and workshops adapted to national contexts will be particularly valuable for generating richer dialogue and opening up opportunities for stronger policy coordination.



The primary intended audience for this Handbook is mid- and senior-level policymakers, reflecting their strategic positions.⁵⁴ The materials can also be adapted for junior public officials as early exposure to systems approaches can strengthen long-term institutional capacity.

The objective of the Handbook is to strengthen the capacities of policymakers. Direct users may also include agrifood systems practitioners working in and with public sector institutions, such as practitioners from the United Nations, development partners and national service providers. By organizing training, workshops and advisory activities, facilitators can help public officials apply the Handbook's concepts in real policy settings, linking technical evidence with national priorities and institutional capacity. Users of the Handbook can also adapt and contextualize its contents to regional, municipal or local agrifood systems policy environments.

The Handbook is a companion to FAO's (2025)¹ seminal report, [Transforming Food and Agriculture through a Systems Approach](#), which provides a practical method for policymakers and practitioners to design integrated solutions. The report identifies six core elements (Box 1) which support the operationalization of a systems approach. This Handbook is designed to equip policymakers with the tools and methods needed to apply the six elements.

The Handbook also complements other FAO capacity-building initiatives that aim to support the adoption of a systems approach in agrifood systems policymaking. These include an e-learning course on Sustainable Food Systems,⁵⁵ a framework for analysis and integration of governance analysis and action into interventions,⁵⁶ a [guide on multistakeholder collaboration](#) co-developed with UNEP and UNDP,²⁴ and a [Food Systems Thinking Guide for UN Resident Coordinators and UN Country Teams](#).⁵⁷

Box 1

The six core elements of a systems approach

**Systems Thinking**

Understand how things are connected and who needs to be involved.

Modules 1 and 2

**Systems Knowledge**

Work together to understand causes, effects and what gets in the way.

Module 2

**Systems Governance**

Share decisions, work across sectors and deal with power imbalances.

Modules 3 and 4

**Systems Doing**

Implement actions that support each other and deliver bigger results.

Modules 3 and 5

**Systems Investment**

Fund the big picture, not just short-term projects.

Module 6

**Systems Learning**

Learn, adjust and share what works.

Module 7

Source: FAO. 2025. *Transforming food and agriculture through a systems approach*. Rome. <https://doi.org/10.4060/cd6071en>

Structure of the Handbook

Each module follows a structured format while also allowing users the flexibility to adapt the content to different training contexts and participant needs. Each module has the same design:

- **Module abstract** – a synopsis of the module's content, suggested duration and learning objectives, with Learning Labs that provide interactive exercises to help participants internalize the concepts through practical application.
- **Key concepts** – an introduction to relevant literature, theories and frameworks, providing an overview of the rest of the module.
- **Thematic sub-sections** – deeper explorations of selected key concepts and tools, supported throughout by aligned real-world country examples.
- **Case studies** – detailed illustrations of country-level applications of the tools or methods introduced conceptually in the module. These case studies are not meant to be seen as one-size-fits-all solutions or panaceas. Instead, they offer a valuable learning opportunity for participants to weigh different policy responses and adapt solutions to fit their own unique challenges.

The modules (see Figure 1) cover the following topics, designed to reflect and build upon the six core elements identified in *Transforming Food and Agriculture through a Systems Approach*.

Module 1 Understanding complexity in agrifood systems

The first module lays the foundation for *Systems Thinking* beyond single-sector perspectives, so that policymakers are equipped to recognize the complexity of agrifood systems, the multiple interactions between sectors, sub-sectors, institutions, components and stakeholders, the challenges that emerge from their interactions, and the possible solutions available to address them.

Module 2 Tools for systems analysis and understanding complexity

The second module familiarizes participants with the qualitative and quantitative tools needed to map agrifood systems, analyse relevant interactions and identify strategic entry points where policy action can have the greatest impact, strengthening *Systems Knowledge*.

Module 3 Strengthening public sector leadership in agrifood systems policy and strategy development

The third module discusses how to move from recognizing complexity to taking action. It explores how public sector leadership through enhanced collaboration across ministries and agencies can be strengthened, as part of *Systems Governance*.

Module 4 Engaging multiple stakeholders in policymaking processes

The fourth module equips policymakers to design multistakeholder processes, address power imbalances and develop strategies to engage diverse actors in policymaking, such as farmers, civil society, private sector, and vulnerable and marginalized groups, with the aim of advancing *Systems Governance*.

Module 5 Policy innovations for systems change - tools and good practices

The fifth module describes how policymakers can embed a culture of experimentation while tackling complex problems, using tools such as proofs of concept, prototyping and piloting. It shows how testing solutions in “safe” environments enables governments to create learning pathways, before policies are scaled.

Module 6 From data to delivery - mobilizing and aligning finance and investment for agrifood systems transformation

The sixth module explores the interplay between policy and finance in tackling complex challenges, focusing on gaps related to data, volume of finance and planning. The module shares public and private sources of finance and tools that can strategically catalyse private investment, promote innovation and advance inclusive outcomes, thereby strengthening *Systems Investment*.

Module 7 Building capacities for a systems approach to policymaking

The last module maps the institutional capacities and skills needed for better policymaking, and introduces tools to assess gaps, promoting long-term *Systems Learning*.

Module 1 Understanding complexity	Module 2 Tools for systems analysis	Module 3 Policy and strategy development	Module 4 Engaging multiple stakeholders	Module 5 Policy innovations	Module 6 Finance and investment	Module 7 Building capacities
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Figure 1. Modules of the publication



Delivering the training modules

The Handbook can be delivered in its entirety over a series of days, or individual modules can be delivered independently, depending on priorities, resources and the availability of the target audience. The contents of the Handbook can also be used as a reference for policymakers to consult for ideas on tools and methods to improve policymaking.

Each training module should be presented by a subject matter specialist, including peer policymakers, practitioners or contracted facilitators tasked with designing a training for policymakers. Subject matter expertise refers to background experience in agriculture and food policy design and implementation.

The delivery of the training may also be undertaken in collaboration with professional facilitators who can support the trainer in structuring sessions, engaging participants and facilitating discussions.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7
Understanding complexity	Tools for systems analysis	Policy and strategy development	Engaging multiple stakeholders	Policy innovations	Finance and investment	Building capacities

The structure of the modules is designed to support their delivery. Trainers and facilitators are encouraged to tailor the delivery approach, including the Learning Labs, to the specific audience and country context as well as to the time and resources available. The following tips offer some general guidance on good facilitation practices:

- **Contextualize content.** As far as possible, adapt examples, discussions and exercises, to the specific country, subnational, municipal, urban or community context where the policymakers work.
- **Be flexible.** Adapt the sequence of modules or use them individually, selecting combinations that best fit institutional priorities, capacities and policy needs.
- **Leverage participants' expertise.** Draw on policymakers' experience, complementing it with insights from the modules and additional facilitator research on local agrifood systems.
- **Foster critical engagement.** Encourage participants to question assumptions and actively engage with complex, multifaceted challenges.
- **Organize group work strategically.** All activities (Learning Labs) in this Handbook are designed to be completed in small groups (e.g. 4–5 people) to encourage open discussion. Where possible, form groups with diverse participants, bringing together individuals from different sectors, backgrounds and areas of expertise to foster cross-sectoral learning.
- **Facilitate reflection and synthesis.** After group discussions or presentations, encourage participants to reflect on what they have learned and how it applies to their work. Highlight themes that emerge and link them to the broader objectives of the session.
- **Ensure inclusivity.** Design discussions and activities to enable equal participation across gender, technical discipline, hierarchical rank and seniority, to ensuring that all participants are able to contribute meaningfully.

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7
Understanding complexity	Tools for systems analysis	Policy and strategy development	Engaging multiple stakeholders	Policy innovations	Finance and investment	Building capacities

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Understanding complexity in agrifood systems



Suggested duration: 2.5 hours

Presentation: 1 hour, 10 minutes

Learning Lab: 50 minutes

Wrap-up and Q&A: 30 minutes

Module abstract

This module introduces agrifood systems. It begins by exploring what “systems” are, drawing on definitions from theory, practice and real-world experiences. Building on shared definitions, the module examines how challenges manifest in agrifood systems and their key characteristics, explaining why they do not always respond to solutions. It provides a foundation for understanding the basic concepts of agrifood systems, preparing the ground for later modules in the Handbook. This module builds on FAO’s *Transforming Food and Agriculture through a Systems Approach*.² It aims to strengthen public sector capacities to apply *Systems Thinking* in policymaking for agrifood systems transformation.

Learning objectives

- Understand what agrifood systems are, drawing on definitions of “systems” from theoretical and practical examples.
- Recognize the complexity of agrifood systems and how their interconnections create opportunities and risks for policymaking.
- Differentiate between tractable and “wicked” policy problems, including why some issues defy simple solutions.
- Identify key characteristics of agrifood systems, such as multipurpose functions, interconnections, diversity and path dependencies, which shape outcomes and policymaking.

Learning Lab

Defining the task

Participants reflect on a wicked problem (e.g. food security, climate impacts on agriculture, food waste) affecting their national, local or regional agrifood system. The concept of wicked problems is explained in [Section 1.3](#).

Activities

- In groups, participants select a “wicked problem” from their own context and analyse it based on the characteristics described in [Table 1](#).
- Participants share the findings of their analysis in a group session.
- Time permitting, participants share a takeaway from the exercise that applies to their current role in agrifood systems.

1.1 Key concepts – navigating complexity

Agrifood systems underpin food security, livelihoods, ecosystems and economies. Their interconnected nature makes them difficult to define and govern. They span multiple sectors, institutions and actors, with objectives that can align or compete, creating both opportunities and risks for policy.^{1,2} Box 2 illustrates this duality by presenting indicators that highlight the opportunities agrifood systems can generate – including employment, gender equality and innovation – as well as the risks and vulnerabilities they create, such as environmental degradation, rural poverty and persistent food insecurity.

The ability to design policies that anticipate trade-offs, align actions across sectors and mobilize diverse stakeholders towards shared objectives, relies on a strong understanding of agrifood systems, their inherent complexity and the characteristics that influence their behaviour.³

Efforts to provide a comprehensive definition of agrifood systems are complicated by their nature. Agrifood systems cut across sectors, scales and disciplines, making it difficult to capture their full impact. Unlike a single policy area or value chain,⁴ agrifood systems encompass the entire journey of food and agricultural products, while interacting with environmental, economic, social and political systems. They involve a wide range of actors, institutions and processes working towards diverse and sometimes competing objectives, across a range of policies. Agrifood systems encompass agrifood productivity, nutrition and health, environmental sustainability, economic growth, livelihoods, equity and food security.^{2,5}

The Sustainable Development Goals (SDGs) emphasize the importance of ensuring that agrifood systems deliver on multiple goals simultaneously. This requires close attention to the linkages between sectors. If these interactions are overlooked, policy action in one area may undermine progress in another, or miss opportunities for synergies.² For example, food insecurity has traditionally been addressed through production-focused solutions, such as subsidized inputs and technologies, or land expansion. While these responses are essential to increase supply, they may neglect drivers of food insecurity that act as barriers to sustainable solutions. Examples include unclear land tenure leading to conflict, marginalization of women in cash-crop value chains, lack of laboratory facilities hindering assessments of soil fertility, weak education systems affecting financial literacy, or poor enforcement of natural resource regulations leading to biodiversity loss.⁶

Insights drawn from systems theory can help clarify these dynamics. Systems thinking, developed within the discipline of biology in the 1940s, was designed to explain the connections within and between organisms and ecosystems. The concept of *General Systems Theory* states that all systems, whether biological, social or organizational, share universal principles, and that the whole cannot be understood simply by analysing its parts in isolation.⁷

In many parts of the world, communities, especially Indigenous Peoples, have been practising systems stewardship approaches to land and resources for many years⁸ – pre-dating formal academic theories. Many Indigenous Peoples hold multigenerational worldviews grounded in

Box 2 Contributions and challenges of agrifood systems

Agrifood systems underpin the livelihoods of billions of people and drive rural economies worldwide, involving diverse groups, from smallholders and women to youth:

- In 2019, 1.23 billion people were employed in agrifood systems, while 3.83 billion people worldwide – nearly half the global population – depended to some degree on agrifood systems for their livelihoods. The share of agrifood employment is vastly higher in developing regions – over 53 percent in Africa and 35.2 percent in Asia – and can rise even further in some countries. For instance, in 2015, in eastern and southern Africa it was estimated that 83 percent of all jobs were in agrifood systems, compared to just 11.2 percent in Europe and 13.5 percent in Oceania.
- Although women comprised just 28.5 percent of the global agricultural workforce in 2022, their share can exceed 80 percent in certain sectors and regions (e.g. in processing, food vending and related services in West Africa).
- Agrifood systems have become hotbeds of technological innovation, with global investments in agrifood research and development (R&D) increasing tenfold from about USD 3 billion in 2012 to nearly USD 30 billion by 2022, driving the development and patenting of more than 3.5 million agrifood inventions.
- Increasing agrifood trade has lowered food prices for consumers and also introduced new fruits, vegetables, grains and processed foods from around the world, potentially enhancing dietary diversity and nutritional content in many regions. Between 2010 and 2020, the average number of food items available for consumption, relative to domestic production, jumped from nearly 60 percent to almost 90 percent, almost doubling the diversity of foods available to consumers.

Despite these vital contributions to livelihoods and employment, agrifood systems face mounting pressures and trade-offs manifesting in escalating emissions, biodiversity impacts and worsening food insecurity:

- In 2024, around 8.2 percent of the global population likely experienced hunger, compared to 8.3 percent in 2023 and 8.7 percent in 2022. This positive trend is due largely to significant progress in Southeast Asia, Southern Asia and South America. However, hunger is continuing to rise in many parts of Africa and Western Asia.
- Some 2.3 billion people (28 percent) worldwide experienced moderate or severe food insecurity in 2024, representing a decrease from 2021.
- Although food prices rose in 2024, the number of people unable to afford a healthy diet decreased from 2.76 billion in 2019 to 2.60 billion in 2024.
- Efforts to reduce child stunting have shown progress, with prevalence dropping from 26.4 percent in 2023 to 23.2 percent in 2024, but progress is too slow to meet global targets. Child wasting (6.6 percent) and overweight (5.5 percent) remained relatively stable over the same period.
- Agrifood systems contribute approximately one-third of global greenhouse gas emissions, stemming from on-farm activities, land use changes (e.g. deforestation and peatland degradation), and supply chain processes such as manufacturing, retail, consumption and food waste. In 2022, global agrifood systems emitted 16.2 billion tonnes of CO₂ equivalent, a 10 percent increase compared to 2000.
- Globally, agriculture accounts for 70 percent of total global water withdrawals, contributing to pressures on wetlands.
- In tropical and subtropical regions, large-scale commercial agriculture accounted for 40 percent of forest loss between 2010 and 2015.
- The onset of the COVID-19 pandemic in 2020 led to a decrease in global agrifood systems employment by 6.8 percent between 2019 and 2020, underscoring their vulnerability to external shocks and disruptions.
- Approximately 1.7 billion people worldwide live in areas experiencing yield gaps linked to human-induced land degradation.

Note: The indicators in this box refer to general global indicators. Annex 1 provides a sample template for sharing national-level indicators, which can be adapted to provide training participants with an overview of the status of respective national or local-level indicators. Consider asking national data experts to present indicators.

Sources: See [Notes](#) at the end of the module.

ancestral knowledge about agrifood systems, emphasizing balance, reciprocity and sustainability. These perspectives are evidence of the fact that systems thinking is not merely a theoretical construct – it is a lived practice, embedded in cultural traditions that continue to offer valuable lessons for managing today’s complex agrifood challenges.⁹ Box 3 provides examples from different groups of Indigenous Peoples that integrate systems approaches into their practices.¹⁰

The interdependencies inherent in agrifood systems often give rise to what the academic literature terms *wicked problems* or *grand challenges*.^{11,12} Problems in agrifood systems rarely have single or straightforward solutions. For example, interventions aimed at boosting production may deplete natural resources if broader dynamics are ignored, exacerbating food insecurity over the long term. Viewing agrifood systems through the lenses of wicked problems and grand challenges helps policymakers to understand their dynamic nature and identify their characteristics. This can help guide the choice of tools and approaches needed to ensure better alignment across multiple objectives.

The remaining sections in this module explore definitions of systems and agrifood systems. They examine how wicked problems and grand challenges manifest in agrifood contexts. Finally, they look at the characteristics of agrifood systems that make a systems approach necessary.

Box 3 Indigenous Peoples’ agrifood systems

Many Indigenous communities have been practising systems thinking for centuries, embedded in holistic, multigenerational world views that draw on ancestral knowledge about agrifood systems. From the Melanesian community of the Solomon Islands to the Inari Sámi of Finland, Indigenous communities have illustrated the value of a systems approach through the application of agroecology, diverse knowledge systems and cultural practices.

A systems approach recognizes that the various elements of an agrifood system, such as biodiversity, soil health, water resources, energy use and cultural practices, are all interconnected and influence one other. The Tikuna, Cocama and Yagua peoples, for instance, use palm trees as a resource for food, handicrafts, medicine, construction and rituals, a practice that highlights the interdependence of food, health, housing and cultural traditions.

In these communities, food production is not just a matter of yields, it is closely linked to ecological impact, social well-being and cultural values. For example, the Maya Ch’orti’ people use natural fertilizers made from kitchen scraps, ash and animal manure to improve their soil, a cyclical system that reintegrates waste to enhance soil fertility. Similarly, the Khasi use fallow periods in agriculture and reuse organic matter as compost, indicating a fundamental awareness of the importance of soil health for sustainable production.

A systems approach also recognizes that agrifood systems are dynamic and adaptive, not static, changing in response to factors such as climate, market pressures and cultural shifts. For instance, the agrifood system of the Tikuna, Cocama and Yagua peoples is specifically adapted to Amazonian flood cycles. They are not reliant solely on a single type of food production or a source of water. Instead, they have diversified their strategies, relying on fishing, farming and gathering at different times of the year, which makes their system more secure in the face of environmental changes such as flooding.

The meaningful involvement of Indigenous Peoples and recognition of Indigenous systems approaches has been identified as critical to achieving the SDGs by 2030.

Source: **FAO and Alliance of Bioversity International and CIAT**. 2021. *Indigenous Peoples’ food systems: Insights on sustainability and resilience from the front line of climate change*. Rome. <https://doi.org/10.4060/cb5131en>

1.2 Building a definition of agrifood systems

The difficulty of defining agrifood systems, the complex challenges they face and the interconnected characteristics that shape them all point to the need for a systems approach.²

Before attempting to define agrifood systems, it is helpful to consider the broader idea of *systems*. The term “system” itself has a number of definitions:

- “A set of interconnected components in dynamic interaction that deliver a number of outcomes” (derived from Estrada, 2024 in FAO, 2025).²
- “A configuration of interacting, interdependent parts that are connected through a web of relationships, forming a whole that is greater than the sum of its parts.”¹³
- “An interconnected and interdependent series of entities, where decisions and actions in one entity are consequential to other neighbouring entities.”¹⁴
- “A set of things – people, cells, molecules or whatever – interconnected in such a way that they produce their own patterns of behaviour over time.”¹⁵

Over recent decades, interest has grown in applying these concepts to policy practice as well as to the complexity of the twenty-first century.^{16–18} Systems approaches have been used in fields as diverse as environmental science, management, organizational planning and military strategy.¹⁹ A well-known example of their application is the US space programme in the 1960s, which brought together multiple sectors and disciplines to achieve a shared goal through experimentation and learning by doing²⁰ – key features of a systems approach (see Modules 3 and 5 for more details).

Concepts like “systems thinking” and “systems approaches” build on the definitions of “systems” and are often used interchangeably. Both emphasize that systems – including agrifood systems – are best understood as complex, interdependent wholes rather than as fragmented components.²¹ There is no single definition for either, but for the purpose of this Handbook the following definitions are useful:

- **systems thinking** is “a practice that focuses on understanding the dynamic interconnections within and between systems, recognizing that outcomes emerge from the interactions of interdependent components rather than from isolated or linear causes”.²
- a **systems approach** refers to “a method of solving problems and advancing solutions that considers the interconnections within and between systems to achieve sustained, systemic change at scale”.²

Box 4 presents selected definitions of *food systems* from the literature to illustrate how the concept is commonly understood and applied.

As illustrated in Box 5, FAO uses the term *agrifood systems* to emphasize that food production and food

Box 4 Definitions of food value chains and food systems

“Food system refers to the complex web of actors and processes involved in growing, processing, distributing, consuming, and disposing of agricultural commodities, including food but also traditional export crops such as cotton, tea, and coffee.”ⁱ

“‘The Food System’ is the interconnected system of everything and everybody that influences, and is influenced by, the activities involved in bringing food from farm to fork and beyond. ... ‘Food Systems’ are the totality of different types of food system in different localities and contexts (i.e. multiple forms of ‘a food system’). This idea of multiple food systems acknowledges the huge diversity of food systems at different scales with differing characteristics. For example, industrial systems at a global scale and alternative systems at a local scale.”ⁱⁱ

Sources: i. **Resnick, D. and Swinnen, J., eds.** 2023. Introduction: Political economy of food system transformation. In: *The political economy of food system transformation: Pathways to progress in a polarized world*. Oxford, Oxford University Press. <https://doi.org/10.1093/oso/9780198882121.003.0001>; ii. **Parsons, K. & Hawkes, C.** 2019. *Rethinking food policy: A fresh approach to policy and practice*. Brief 5: Policy coherence in food systems. London, Centre for Food Policy, City, University of London. https://symposium.bayes.citystgeorges.ac.uk/_data/assets/pdf_file/0018/504621/7643_Brief-5_Policy_coherence_in_food_systems_2021_SP_AW.pdf

security are embedded not only in food value chains, but also in the economic, social, environmental and institutional systems that sustain them. According to FAO, agrifood systems “encompass the journey of food from farm to table – including how it is grown, fished, harvested, processed, packaged, transported, distributed, traded, purchased, prepared, consumed, disposed of and reused. They also include non-food products that support livelihoods, and all the people, activities, investments, and decisions involved in delivering these food and agricultural products”.²² Their many components include people, practices, products, policies, infrastructures and values.² Frequently asked questions on concepts and definitions related to agrifood systems transformation can be consulted [here](#).

Taken together, these definitions highlight the complex nature of agrifood systems, which also makes them prone to challenges that are difficult to define and resolve – often described as “wicked problems”. These are explored in the next section.

Box 5 What are agrifood systems?

Agrifood systems are broader than “food systems”; they include other agricultural products like biofuels, fibres, wood and non-wood forest products, marine products, and other natural resources and raw materials – and everything they touch. In the FAO Constitution, the term “agriculture” and its derivatives include crop and livestock products, fisheries, marine products, aquaculture, forests and primary forestry products.

These non-food products matter because they form part of the agricultural economy, shape rural livelihoods, and affect land, water and environmental sustainability. All of these elements have an impact on global food supply and provide resources needed to access food.

The term “agrifood system” encompasses a broader picture that shows how food and non-food agricultural products are connected. This holistic view can support better decision-making in agrifood systems and a longer-term perspective.

Source: **FAO.** 2026. *Frequently asked questions on agrifood systems transformation*. [Cited 3 July 2026] <https://www.fao.org/food-systems/faq/en/>

1.3 Differentiating types of policy problems – from wicked to grand challenges

Complex systems like agrifood systems generate challenges as a result of the dynamic interactions of multiple actors and interventions. When addressing policy problems in this complex environment, the concepts of “wicked problems” and “grand challenges” can be useful lenses. These two terms can help policymakers better understand and analyse the dynamic nature of agrifood and identify appropriate tools to address key issues.^{11,12}

- “Wicked problems” refer to issues that are difficult to define, and which may be caused by several factors, with interconnected consequences. Because of their cross-sectoral, evolving nature, they require different ways of thinking, acting and evaluating progress than single-sector policies.
- The term “grand challenges” describes problems that require substantial effort, collaboration and innovation to effectively address.

While the two concepts are often used interchangeably, there are some differences in nuance. Grand challenges often have measurable targets (e.g. “reduce greenhouse gas emissions by 50 percent by 2050”), which governments and private organizations use to mobilize resources and collaboration. Wicked problems have ambiguous or evolving goals that may require ongoing re-evaluation, and are managed instead of “solved”.¹¹

Not all policy problems need to be considered as “wicked” or “grand”, even though they may share some of the same characteristics. Examples of issues that may be influenced by broader wicked or grand challenges include:

- **Farmers’ lack of market information on commodity prices.** This can lead to selling surpluses at too low a price or missing better buyers. Although not necessarily simple to resolve – because it requires collaboration among traders, extension services and telecom providers – well-established solutions exist. Collecting daily prices at key markets and sharing them via SMS or notice boards has proven effective, for example. Success can be measured by tracking how many farmers receive updates and comparing their sale prices before and after.²³ Because the problem is clearly defined, the technology is available and outcomes are relatively straightforward to monitor, it remains a policy issue rather than a wicked problem.
- **Unfair prices due to uncalibrated weighing scales in local markets.** Installing and routinely calibrating standardized scales provides an effective, easily monitored solution, making this a non-wicked problem.

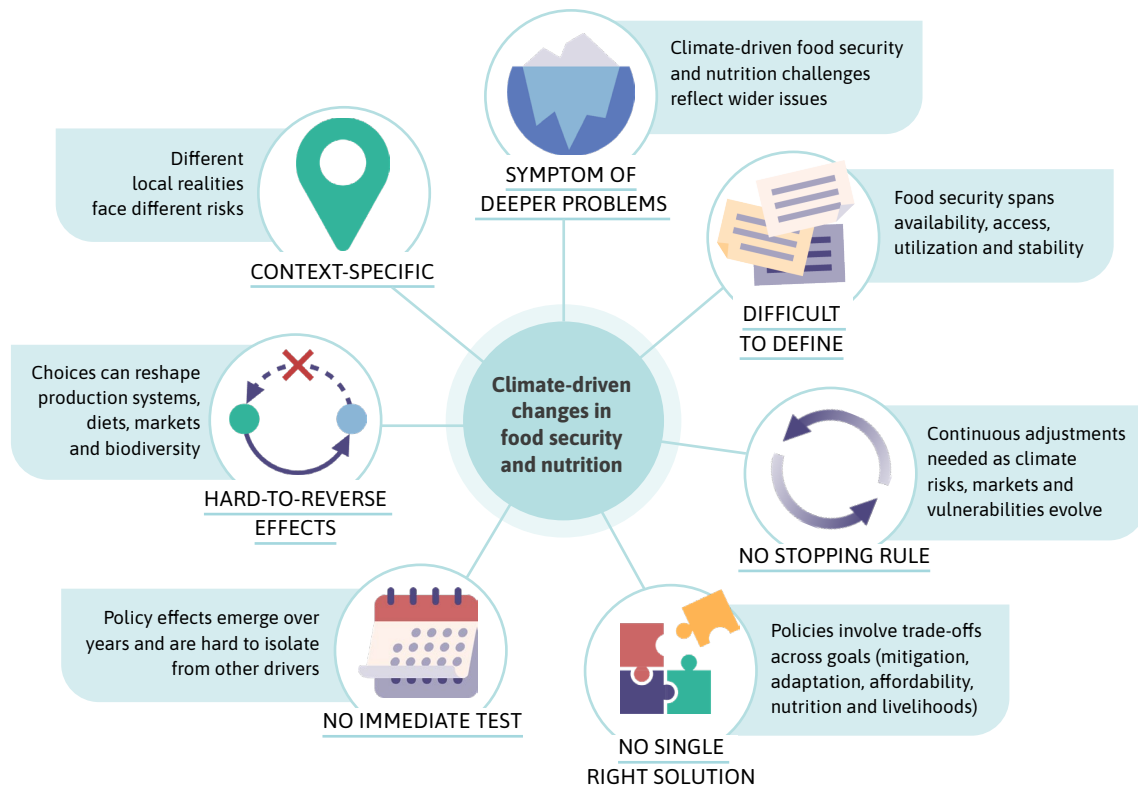
In contrast, climate-driven food insecurity can be understood as a wicked problem. Food security exists when “all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.²⁴ Climate change disrupts each of these dimensions (availability, access, utilisation and stability) by interacting biophysical, socioeconomic and institutional pathways. The characteristics that make climate-driven disruption “wicked” are summarized in Table 1 and Figure 2.

Table 1. Characteristics of a wicked problem: Climate-driven changes in food security and nutrition

Characteristics of wicked problems	Climate-driven changes in food security and nutrition
Difficult to define: There is no definitive formulation. 	Food security and nutrition encompass availability, physical/economic access, utilization (diet quality, health) and stability. Climate change affects these dimensions through multiple pathways, including droughts, floods, pests, heat stress and market disruptions. As a result, it is difficult to formulate a single problem statement. Also, different stakeholders may prioritize different aspects of the challenge, such as affordability, diet quality, resilience or social justice.
No stopping rule. 	Food insecurity demands continuous policy action as climate risks evolve. Responses may need to include regular updates to early-warning systems and safety nets (stability), climate-informed procurement and price policies (access), cold chains and water quality controls (utilization), and diversified production and import strategies (availability).
No single right solution. 	No single intervention can resolve climate-driven food security and nutrition challenges. Measures like carbon pricing or bioenergy expansion may reduce emissions but also raise food prices and worsen hunger in vulnerable regions. Because food security spans multiple dimensions, policy packages need to combine complementary measures (e.g. targeted food aid, resilient agriculture) to balance climate and food security goals.
No immediate or ultimate test for solutions. 	The effects of climate and agrifood policies often emerge over years or decades. For example, renewable energy incentives, climate agreements or adaptation programmes may take time to influence emissions, production systems, prices, diets or resilience. Their impact can also be hard to isolate from other factors like economic cycles, technological advancements, conflict or demographic shifts.
Attempts at solutions may have irreversible or hard-to-reverse effects. 	Some interventions can create long-lasting changes in production, markets, diets and institutions. For example, concentrating support on a single drought-tolerant staple may reduce agrobiodiversity, narrow diets, reshape procurement and market incentives, and increase dependence on a single crop. Once input systems, subsidies and purchasing arrangements are reoriented, reversing course can be slow and costly.
Essentially unique. 	Climate change affects food security and nutrition differently across places and population groups. Coastal fishing communities may face cyclones and rising sea levels; pastoral areas may experience drought and rangeland degradation; and dense urban areas may be exposed to heat, price spikes and cold-chain failures. Responses therefore need to be tailored to specific ecological, socioeconomic and institutional contexts.
Every wicked problem may be a symptom of deeper systemic problems. 	Climate-driven food security and nutrition challenges are tied to broader systemic issues, including economic structures, energy dependency, deforestation, unsustainable consumption and global inequality. Addressing these challenges requires action beyond the agrifood sector, including measures that tackle underlying drivers of vulnerability and unsustainable resource use.

Sources: Authors' own elaboration, adapted from **Rittel, H.W.J. & Webber, M.M.** 1973. Dilemmas in a general theory of planning. *Policy Sciences*, 4(2): 155–169.; **Fujimori, S., Hasegawa, T., Krey, V., Riahi, K., Bertram, C., Bodirsky, B.L., Bosetti, V. et al.** 2019. A multi-model assessment of food security implications of climate change mitigation. *Nature Sustainability*, 2(5): 386–396. <https://doi.org/10.1038/s41893-019-0286-2>; **Pradilla, C.A., Da Silva, J.B. & Reinecke, J.** 2022. Wicked problems and new ways of organizing: How Fe y Alegria confronted changing manifestations of poverty. In: A.A. Gümüşay, E. Marti, H. Trittin-Ulbrich & C. Wickert, eds. *Research in the sociology of organizations*, pp. 93–114. Leeds, UK, Emerald Publishing Limited. <https://doi.org/10.1108/S0733-558X20220000079007>

Figure 2. Characteristics of a wicked problem: Climate-driven changes in food security and nutrition



Source: Authors' own elaboration.

1.4 Key characteristics of agrifood systems

In addition to clarifying definitions and drawing on wicked problems theory, it is useful to identify the core characteristics that shape how agrifood systems function.⁵ These characteristics highlight patterns such as interdependence across sectors and the coexistence of multiple, sometimes competing, objectives that can limit or amplify risks or opportunities.²

Multipurpose functions and outcomes

The core function of agrifood systems is to produce and deliver food and agricultural products that sustain people and livelihoods. At the same time, they serve multiple purposes beyond food supply, shaping nutrition and health, influencing environmental sustainability, generating economic opportunities and jobs, and affecting social equity, cultural practices and resilience.² Because these multiple functions are shaped by the interactions of diverse actors, policies, technologies and market forces, changes introduced to achieve one objective can generate unintended effects elsewhere in the system.

Obesity, for instance, has emerged from a mix of trends. These include the emergence of technologies that enable the production of cheaper processed foods; industry business models and competitive pressures that affect how food is marketed and sold; busy lifestyles with less time for food preparation in the home; and a shift towards more sedentary jobs, or less physical activity due to motorized transportation. These factors, each aiming to address other needs, have collectively contributed to the rise in obesity.⁵

Interconnections, trade-offs and synergies

Agrifood systems are made up of many interdependent parts. Changes to one area therefore can have far-reaching, sometimes unforeseen effects in other areas. Ignoring interconnectedness in agrifood systems can result in trade-offs, where gains in one area create costs in another. Conversely, recognizing and leveraging these links can generate synergies, where progress in one domain reinforces positive outcomes in others.²

The interconnected nature of agrifood systems means that different parts of these systems are influenced by chains of cause and effect. This concept, known as “feedback loops”, is explored in Module 2. Box 6 and Figure 3 provide an example of interconnectedness related to programmes and policies on school meals.

Box 6 Interconnectedness and policies for school meals

Developing policies and programmes that increase children’s daily access to nutritious school meals means recognizing that school meals are not a single intervention. Rather, they are the result of interactions across the agrifood system. Decisions made in policy, finance, production, procurement, processing and service delivery all shape whether and how children receive a nutritious meal at school, as well as the broader impact of school meals across the agrifood system.

These interconnections are often managed implicitly across sectors and institutions. Making them intentional and explicit through policy design and coordination is critical. Ensuring access to a school meal, for example, is not just about food provision. It requires coordinated interventions on both the demand and the supply side, including coordinated actions among policymakers from different sectors, public procurement personnel, suppliers, banks, caterers, nutritionists, school staff and communities. Nutrition and food safety standards can help ensure that school meals contribute to children’s health and well-being, while also providing an entry point for integrating broader social, economic and environmental considerations. At the same time, public procurement policies, rules and procedures can be designed to create stable and favourable market opportunities for local producers and to foster more sustainable production patterns. Where implementation is decentralized, resources and responsibilities can be channelled to local authorities or directly to schools, enabling meals to reflect local food baskets, dietary preferences and available supply.

Beyond ensuring delivery, school meal programmes can also be purposefully designed to generate multiple benefits across the agrifood system. When school food, nutrition and procurement policies prioritize fresh, diverse, locally sourced and more sustainably produced foods, they can incentivize farmers to produce more nutritious crops, strengthen local supply chains, promote environmentally friendly production practices and support smallholder food producers, including small and medium-sized enterprises. In schools, safe preparation and culturally appropriate menus help to translate these upstream decisions into meals that children will eat and benefit from.

When these interdependencies are explicitly aligned through coherent governance, policy and regulatory frameworks, functioning supply chains, and public institutions with the infrastructure, staff and capacity needed to purchase, prepare and serve nutritious and appealing meals, the result is more than food on a plate. School meal programmes can simultaneously improve child nutrition and school attendance, strengthen local economies, support more nutritious and sustainable food production, and contribute to long-term public health and education outcomes. Figure 3 depicts the system components that interact in diverse ways to produce a school meal.

Source: See [Notes](#) at the end of the module.

Figure 3. Interactions among system components in school meal programmes



Source: Authors' own elaboration.

Diverse components

Agrifood systems are made up of diverse components. Some are “hard”, such as infrastructure, natural resources, technologies and products; others are “soft”, such as people, processes, policies, knowledge, preferences, culture, norms and values.² These components differ across contexts, cultures, economies and geographies. Diversity also arises from the different values that people hold. For example, informal markets may be seen as a risk to food quality and safety, while also being viewed as vital sources of income for local communities or as ways of maintaining connections to local food heritage.⁵

Power asymmetries

Different actors and institutions have differing levels of power in agrifood systems. Power differences among actors emerge from varying levels of resources, including their relationships, funding, knowledge, mandates, skills and influence. Levels of power can also be shaped by external factors, like historical and cultural contexts, forms of discrimination, and formal and informal institutional contexts. Together, these factors shape the extent of the influence actors and groups have within systems.²⁵

Dynamic and evolving

Because agrifood systems are shaped by interconnections, feedback loops and non-linear dynamics, the effects of any single action are hard to predict. Agrifood systems can also be subject to path dependency, a concept that refers to how today’s outcomes are shaped not only by current actions but also by past policy decisions and investment patterns.³ Box 7 illustrates how long-standing policy and institutional support for synthetic pesticides has created path dependencies in farming systems, presenting both challenges and opportunities for those seeking to shift towards more sustainable pest management practices.

Box 7 Breaking path dependency in pesticide use

Synthetic pesticides have been instrumental in boosting agricultural productivity. This has led to policy and institutional set-ups that have promoted their widespread adoption, particularly in industrialized countries. Over time, these policy and institutional environments have enabled countries to respond to the demand for more affordable food, freeing-up income previously used for food bills for spending on other household items and services.

Faced with growing evidence of the environmental and human health impacts of overuse of pesticides, governments are increasingly introducing climate-sensitive policies to their mitigate adverse effects. Some governments are promoting alternative sustainable production approaches such as Integrated Pest Management (IPM). In spite of these efforts, the path dependency established by some aspects of industrial farming has created significant barriers for farmers attempting to shift towards more environmentally sustainable production methods. These include the need to acquire new knowledge, develop new skills and invest in cleaner, alternative technologies. Moving away from established paths also requires navigating new regulatory frameworks and pricing structures, which incentivize and support sustainable choices.

Source: **Conti, C., Zanello, G. & Hall, A.** 2021. Why are agri-food systems resistant to new directions of change? A systematic review. *Global Food Security*, 31: 100576. <https://doi.org/10.1016/j.gfs.2021.100576>.

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Tools for systems analysis and understanding complexity



Suggested duration: 3.5 hours

Presentation: 1 hour

Learning Lab: 2 hours

Wrap-up and Q&A: 30 minutes

Module abstract

Agrifood systems are complex and interconnected: policies, practices and resources interact across sectors, generating feedback and multiple outcomes and problems that can be difficult to understand, anticipate and address using linear analytical approaches. This module introduces systems analytical tools to help policymakers interpret and cross-fertilize insights across sectors, disciplines and methods. Explaining the qualitative, quantitative and semi-quantitative characteristics of these tools, the module shows how they can support complex problem framing in agrifood systems, identify strategic entry points for solutions, and anticipate responses to interventions in order to improve coherence across policy frameworks. The module builds on FAO's *Transforming Food and Agriculture through a Systems Approach*.¹ It aims to strengthen public sector capacities to apply *Systems Knowledge* and *Systems Thinking* in policymaking for agrifood systems transformation.

Learning objectives

- Identify the strengths and limitations of different analytical tools that can be used to generate evidence for agrifood systems policymaking.
- Understand how various analytical tools can be combined to explain complex problems and identify innovative solutions.

Learning Lab

Defining the task

Participants explore the deeper factors driving complex problems and apply analytical tools to agrifood systems policymaking.

Activities

- In groups, ask participants to select a complex problem affecting their regional, national or local agrifood system. See [Module 1, Section 1.3](#) for an explanation and examples of complex problems.
- Each group discusses their selected problem, following the four layers of the Iceberg Model (around 20 minutes to discuss each layer). See [Section 2.2.4](#) for details of the model.
- Back in the main discussion group, each individual group presents insights gained about the problem and briefly describes potential interventions to address the root causes.
- Participants are then encouraged to pose questions to the other groups, identifying common threads among the root causes of the different problems.
- Following the group presentations, the participants reflect on the implications of the discussion and write down a single action they will apply to their own work.

2.1 Key concepts – using systems analytical tools to support evidence-based agrifood systems policies

The complex nature of agrifood systems means that policies and practices relating to food and agriculture often produce interconnected outcomes. Conventional siloed approaches, including for gathering, analysing and communicating data and evidence, are insufficient for agrifood systems policymaking processes.¹ This has led to broad recognition of the need to strengthen how data and evidence are sourced, used and communicated in ways that reflect the complexity of agrifood systems.

Strengthening the institutional management, communication and integration of data and evidence into policymaking processes contributes to the application of a systems approach to agrifood systems transformation.³⁻⁵ Systems analytical tools that support the cross-fertilization of knowledge across sectors and disciplines, can also contribute to strengthening the cross-institutional handling of data and evidence. Tools can for instance facilitate the structuring and communication of data from diverse disciplines and sources in ways that make complexity more manageable and the interconnections across sectors, actors and institutions more transparent.

No single analytical tool by itself is sufficient to inform agrifood systems policymaking; combining complementary approaches is key to addressing diverse and complex policy questions. Some systems analytical tools support problem framing, while others focus on generating new perspectives from data and evidence. A variety of analytical tools can be considered for informing policy design, and using combinations of different types of tools will improve cross-disciplinary assessments of problems and interconnections across institutions and policy domains.¹ This module introduces a selection of tools with examples of how they can be used to support these objectives.

The tools shared in this module, are intended to provide policymakers with insights, including visual evidence, to support key policymaking needs related to the complex nature of agrifood systems. These include:

- Defining agrifood systems problems, visualizing complexity (see also Module 1), and mapping institutions and interrelationships among actors and sectors (see also Modules 3 and 4).
- Providing inputs to multistakeholder processes responsible for creating a shared vision and agrifood systems strategy development processes (see also Module 4).
- Identifying leverage points to strategically shift parts of systems for accelerated change (see section 2.2.5 below).
- Identifying public and private sector gaps in investments (see also Module 6).
- Supporting simulations and piloting technical and policy innovations with a view to scaling (see also Module 5).
- Identifying capacity gaps by tracking trends and lessons over time to evaluate policy impacts (see also Module 7).

Policymakers do not necessarily need to understand the technical details of all of these tools; however, familiarity with their uses can contribute to how data and evidence improve a systems approach to agrifood systems policymaking processes.

The instruments described include both qualitative and quantitative systems analytical tools, shared with the intention of eliciting evidence from multiple disciplines and sources. Some of the tools can be applied *ex ante* (to assess potential impacts before implementation) and/or *ex post* (to assess outcomes and inform adjustments).⁵

Qualitative systems tools such as *spaghetti maps* can capture the complexity of relationships among public and non-state actors, institutions and ideas, while *causal loop diagrams* illustrate how variables – such as those related to climate change and nutrition – interact through feedback loops.^{6,7}

Quantifying variables, relationships and system dynamics provides another layer of insights through measurable data. For instance, quantitative modelling uses equations and formulas to communicate how different components of agrifood systems interact over time.⁵ Depending on the type of model and purpose, these tools can be used for predictions, forecasting and simulations. They can assess how changes in key variables affect systems outcomes, estimating, for instance, the impacts of policy interventions expressed in percentage changes, absolute changes (deltas) or cost–benefit metrics, among others.^{8,9}

Some tools, such as *stock-flow diagrams*, can also be used as a basis for quantitative modelling, while others combine qualitative and quantitative elements, such as *Fuzzy Cognitive Mapping*.¹⁰ The level of precision and quantification varies across tools, with qualitative and semi-quantitative approaches relying more on expert judgement, while fully quantitative models provide estimates with more precise parameters.

This module presents a selection of analytical tools to help stakeholders with diverse agendas deconstruct complex problems. In addition to briefly describing how a selection of these tools work and their potential uses, the module also provides examples of their application in the context of policymaking for agrifood systems transformation.

The module also shares a number of initiatives that combine different analytical tools to support country-level policymaking and investment planning for agrifood systems transformation. The examples provided include initiatives led by FAO in collaboration with development partners. For instance, the [Hand-in-Hand Initiative](#) integrates geospatial data, quantitative modelling and stakeholder-driven processes to identify priority investment areas, blending data-driven insights with participatory engagement. This multipartner project also combines quantitative indicators and modelling to capture the complex interactions within agrifood systems. Similarly, foresight exercises, such as [Food Safety Foresight](#), integrate qualitative tools such as horizon scanning and scenario planning, with science and quantitative projections to explore alternative future scenarios on food safety.

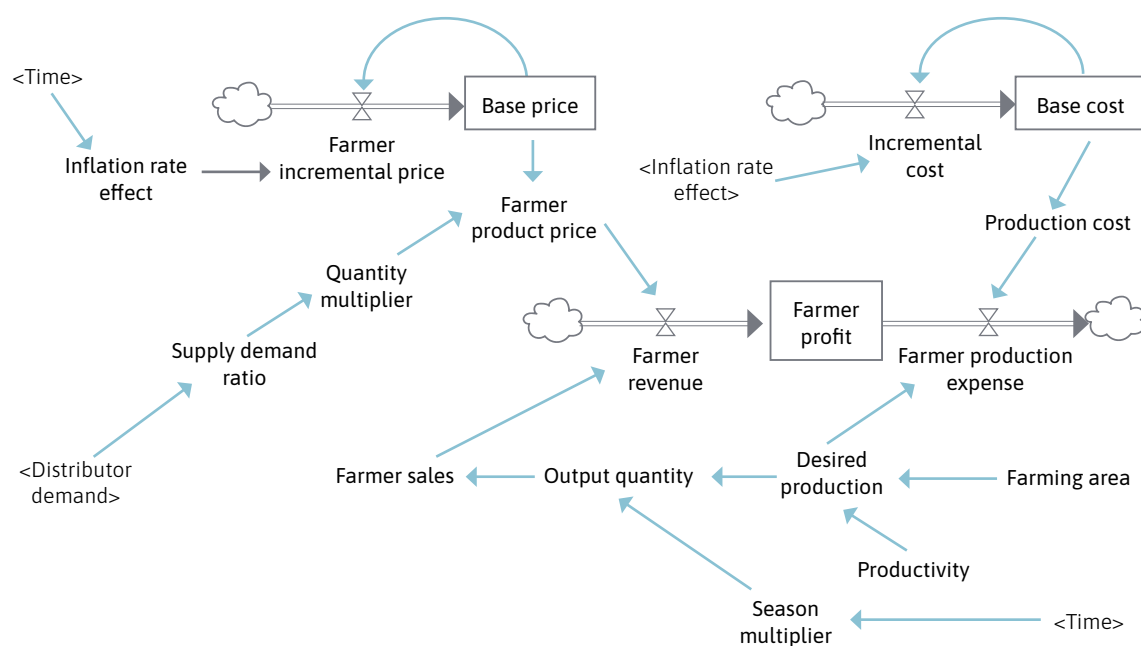
2.2 Exploring systems analytical and modelling tools

Combining a range of systems analytical and modelling tools can help policymakers frame complex problems in agrifood systems, structure information in different ways and determine the type of evidence needed to design cross-sectoral policy solutions. These tools span qualitative, quantitative and semi-quantitative approaches, with each serving different but complementary purposes – from mapping system relationships and diagnosing root causes, to simulating systems behaviour and assessing the potential impacts of policy interventions. Examples of these tools are presented in the following sections and illustrated in Figures 4-9 and Boxes 8-9.

2.2.1 Stock-flow diagrams

Stock-flow diagrams visually illustrate, qualitatively or quantitatively, how resources (e.g. fertilizer, seeds, food produce) enter (inflows) and leave (outflows) a system over time. They can be used qualitatively as a visual map or quantitatively by converting flows into equations to simulate how changes in drivers affect resource levels and outcomes over time. Stock-flow diagrams enable policymakers to pinpoint where interventions can influence system outcomes by acting on key flows (e.g. input supply, market access, productivity drivers). Figure 4 presents a farmer profit model showing how price, costs and productivity interact as stocks and flows, highlighting policy entry points such as input subsidies, market access or yield improvements.

Figure 4. Stock-flow diagram of farmer profits

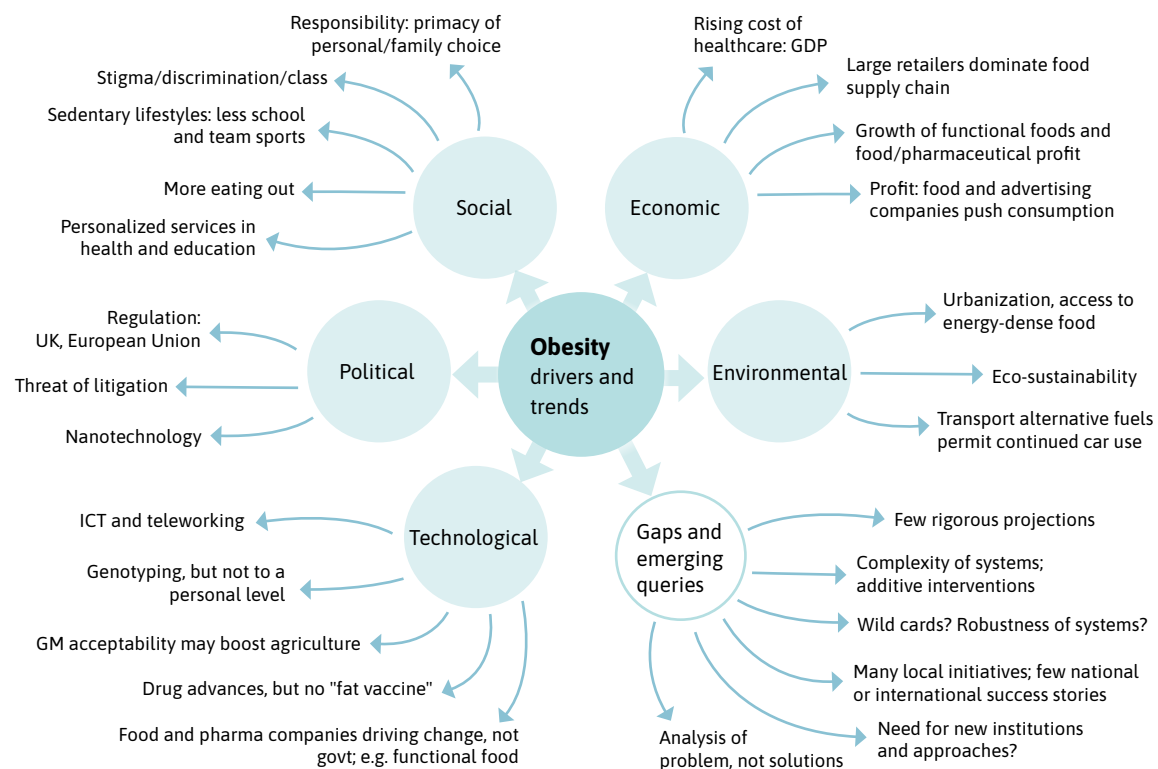


Source: Adapted from Tama, I., Eunike, A. & Akbar, Z. 2018. Implementation of system dynamic simulation method to optimize profit in supply chain network of vegetable product. *IOP Conference Series: Materials Science and Engineering*, 337(1): 012014. <https://doi.org/10.1088/1757-899X/337/1/012014>

2.2.2 Spaghetti maps

Spaghetti maps visually convey dense and complex networks of policies, actors, resources, information, institutions and ideas, illustrating the relationships between them. The name comes from the messy, overlapping lines that resemble spaghetti. The maps help policymakers diagnose coordination challenges, identify bottlenecks and target interventions across multiple actors and sectors. Figure 5 shows a spaghetti map for obesity showing interconnected drivers and trends across social, economic, environmental and political domains. It highlights multiple intervention points such as regulation, urban planning and public health campaigns.

Figure 5. Spaghetti map showing obesity drivers and trends

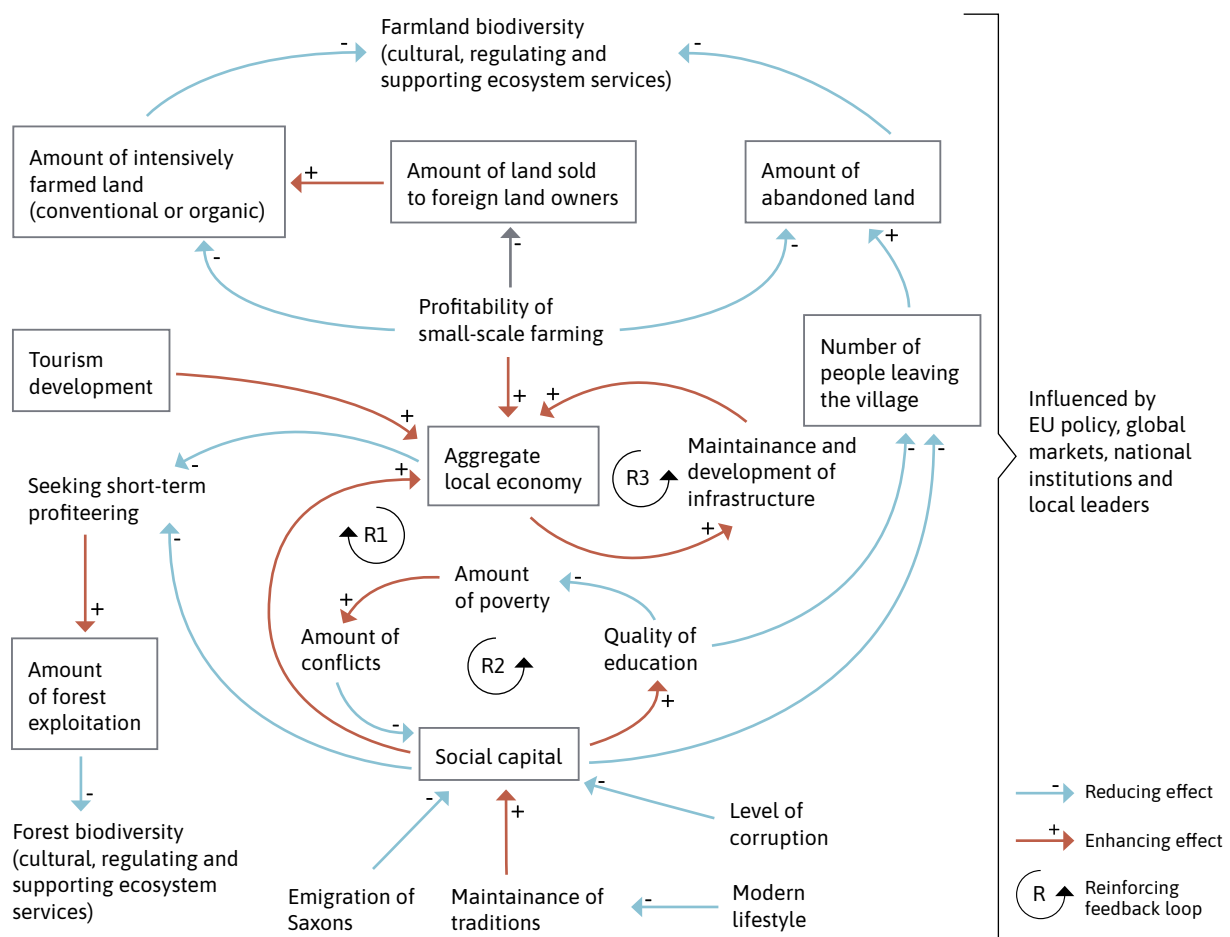


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2.2.3 Causal loop diagrams

Causal loop diagrams map relationships between variables in a system, highlighting connections that drive outcomes and underlying dynamics, particularly feedback loops that shape systems behaviour. They can help policymakers anticipate systems responses to interventions, including reinforcing and balancing effects, and reduce unintended consequences. Figure 6 illustrates a causal loop diagram showcasing the dynamics of the regional social-ecological system in southern Transylvania. The reinforcing loops (e.g. poverty–conflict cycles) and balancing loops (e.g. education reducing migration) describe how interventions can shift system dynamics.

Figure 6. Causal loop diagram summarizing the dynamics of the regional social-ecological system in southern Transylvania



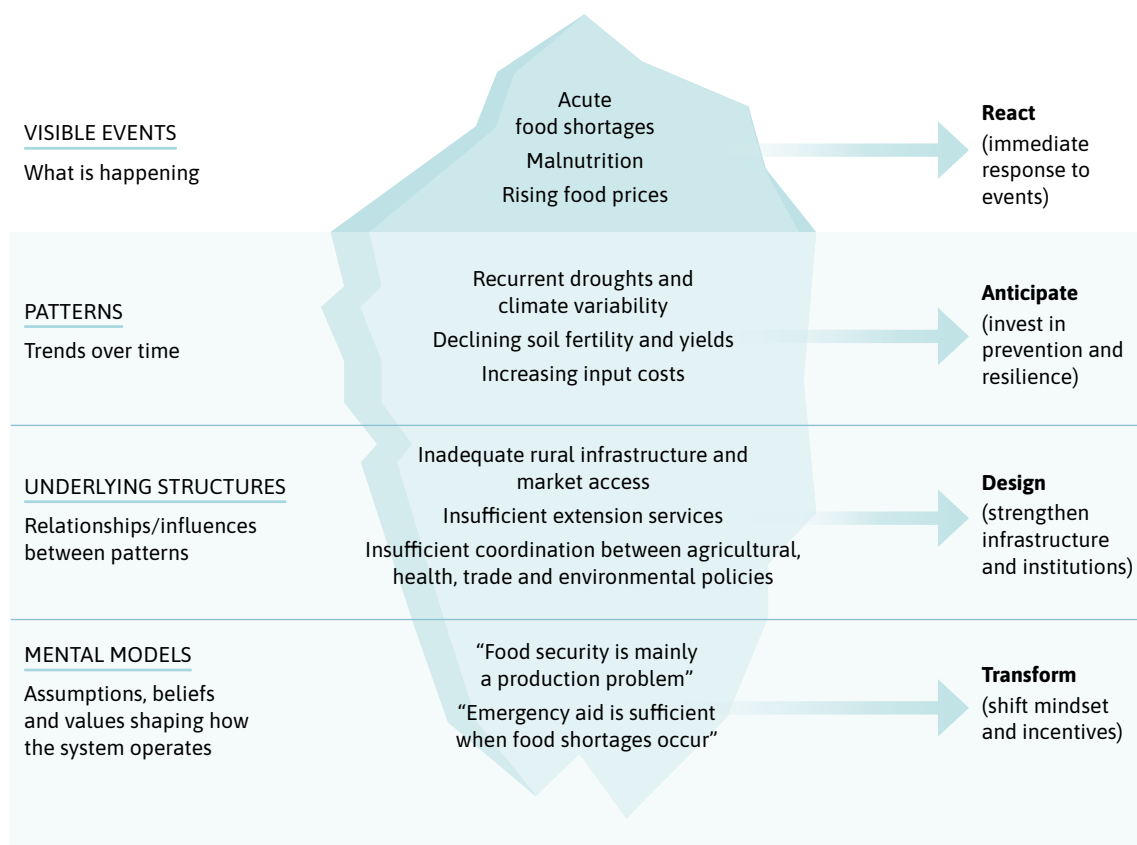
Source: Adapted from Hanspach, J., Hartel, T., Milcu, A.I., Mikulcak, F., Dorresteijn, I., Loos, J., Von Wehrden, H. et al. 2014. A holistic approach to studying social-ecological systems and its application to southern Transylvania. *Ecology and Society*, 19(4): art32. <https://doi.org/10.5751/ES-06915-190432>

2.2.4 Iceberg model

Iceberg models help analyse the deeper layers of problems, using a series of guiding questions to move from visible events to underlying patterns, structures and mental models that shape outcomes. They can help policymakers move beyond symptoms to design interventions that address structural drivers and underlying assumptions shaping policy problems. Figure 7 illustrates a food insecurity example moving from visible malnutrition to underlying patterns (e.g. drought trends), structural issues (e.g. market access) and mental models (e.g. input use practices), informing long-term interventions.

The Iceberg Model can support policymakers in investigating trends (e.g. soil infertility and increased reliance on imported fertilizers), structures (e.g. lack of knowledge on fertilizer usage and sufficient extension services) and mental models (more fertilizer use increases production during initial application without understanding the impact on long-term soil fertility).¹⁰

Figure 7. Applying the Iceberg Model to analyse food insecurity

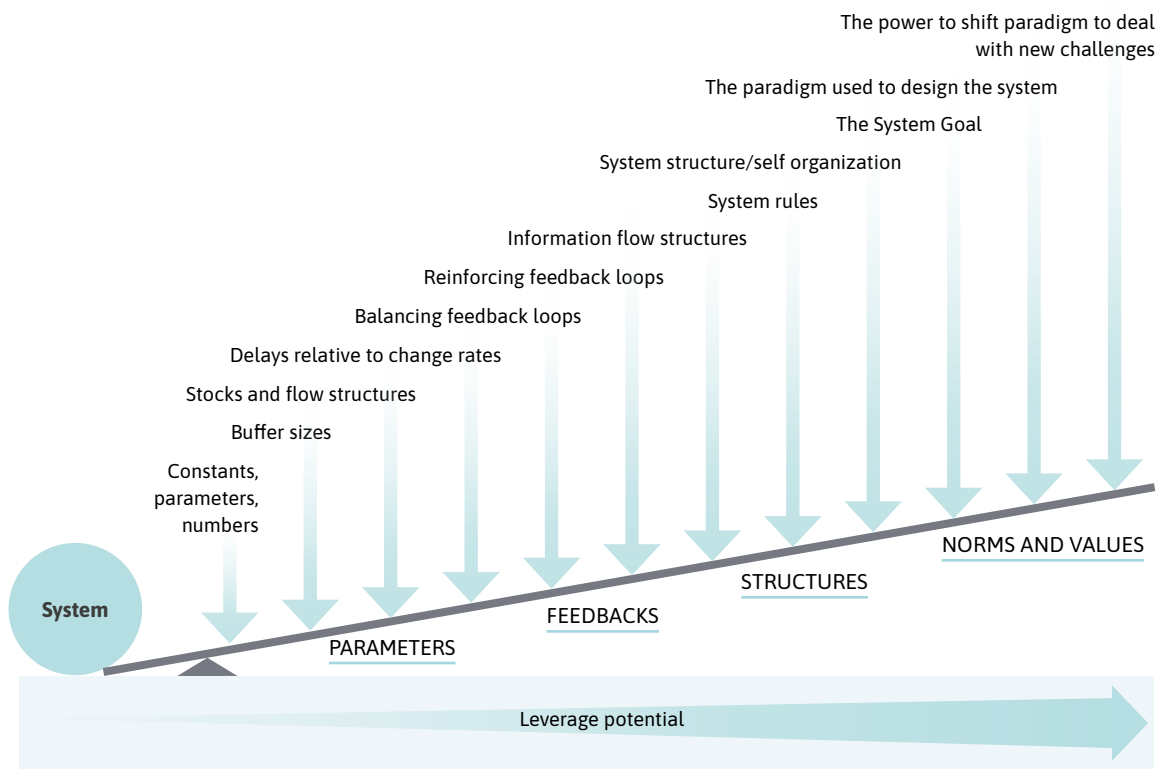


Source: Author's own elaboration, adapted from **The Donella Meadows Project**. n.d. Systems Thinking Resources: The Iceberg Model. In: Academy for Systems Change [Cited 12 September 2024]. <https://donellameadows.org/systems-thinking-resources>

2.2.5 Leverage points

Leverage points refer to strategic entry points in a system, ranked by their potential to drive transformation, ranging from simple, short-term interventions to deeper systemic changes affecting system goals or mindsets. Leverage points can support the prioritization of policy interventions by distinguishing between incremental actions and those capable of driving transformative, systems-wide change. Figure 8 provides a visual representation of the model and Box 8 presents an example from Rwanda of how different policy instruments have converged to contribute to sustainable improvements in the country's food and nutrition security.

Figure 8. Leverage points: strategic options to intervene in a system



Source: Adapted from **Meadows, D.** 1999. *Leverage points: Places to intervene in a system*. The Sustainability Institute.

Box 8

Rwanda's sustainable agrifood system interventions

One of Rwanda's main programmatic vehicles for improving food and nutrition security is the Crop Intensification Program (CIP). Launched in 2007, the programme focuses on increasing the production of several key agricultural commodities. It encompasses interventions such as increasing input use (e.g. fertilizers), improving irrigation and expanding land use levels. These reflect "changes in parameters", the "weakest" leverage point in terms of the power to change systems. CIP also consists of provision of extension services to farmers which can be categorized as a change in the "Flows" of the system. Extension services can facilitate the flow of crucial information and knowledge, such as innovative farming techniques or market trends and regulatory changes.

The programme also contains a land consolidation component which would fall under the category of "Rules of the System". This leverage point involves changing the rules that dictate how elements within a system operate, including laws, policies, incentives and sanctions.

Another example of an intervention that aims to tackle food insecurity is the "One Cow per Poor Family" programme. This can be seen as a change in "stocks" as the cow represents an asset for the family, providing ongoing "inflows" like milk or income.

Rwanda has also been experiencing a shift in "the paradigm used to design the system", reflected in its move away from a production and productivity-centric approach to food insecurity, to a more holistic view that encompasses modernization of the agrifood sector and environmental sustainability. This is reflected in efforts over the past decade to mainstream environmental sustainability through various instruments like the Rwanda Environment Management Authority (REMA) established to oversee the country's policies. The establishment of the Rwanda Green Fund (FONERWA) is also a noteworthy initiative. The fund is a means through which financial and technical support is provided to public and private projects that align with the country's commitment to developing a green economy. One of its projects for example, aims to introduce climate smart approaches to farmers who are beneficiaries of the One Cow per Poor Family programme.

Sources: Del Prete, D., Ghins, L., Magrini, E. & Pauw, K. 2019. Land consolidation, specialization and household diets: Evidence from Rwanda. *Food Policy*, 83: 139–149. <https://doi.org/10.1016/j.foodpol.2018.12.007>; FORNERA. 2024. Greening Girinka. In: *Rwanda Green Fund*. [Cited 2 May 2024]. <https://misgicumbi.greenfund.rw/greening-girinka>; Wigboldus, S., Guijt, J. & Garcia-Campos, P. 2021. *Rwanda's journey towards sustainable food systems*. Rome, FAO. <https://doi.org/10.4060/cb6057en>; Ilie, E.T., Kelly, S., Felici, F.B., Kattel, R. & Roll, K. 2025. *Workshop report on training for policymakers on agrifood systems transformation*. Rome, FAO. <https://openknowledge.fao.org/handle/20.500.14283/cd4341en>

2.2.6 Quantitative modelling

Quantitative modelling uses equations and formulas to quantify relationships between components of a system. It can assess how a system is affected when a variable changes (prediction models), provide insights on potential future impacts (forecasting models) or deliver projections (model simulations) on the numerical impact (percental change, absolute change or cost-benefit analysis) of policy change. Quantitative modelling can support policymakers in assessing the potential impacts of policy options through simulations, including by estimating changes in outcomes (e.g. estimated changes in production, prices, soil fertility, food security outcomes based on investments made in input subsidies or fertilizers). Multiple stakeholders such as farmers, policymakers and researchers can co-develop models to inform a policy instrument or investment decision.

Box 9 presents selected initiatives that demonstrate how combinations of systems analytical and modelling tools are applied in practice to support evidence-based policymaking for agrifood systems transformation. It illustrates how diverse data sources, analytical methods and multistakeholder processes can be integrated to inform policy design and guide investment decisions. The initiatives also highlight a shift in analytic trends from static analysis to continuous, systems approaches that can support policymakers better understand complex problems and interactions and to anticipate future challenges and coordinate interventions across sectors.

Box 9

Integrating analytical tools for evidence-based policymaking on agrifood systems transformation: examples from FAO initiatives

Hand-in-Hand Initiative

The **Hand-in-Hand Initiative** leverages data-driven insights, multistakeholder partnerships, and coordinated investment and capacity-building to support agrifood systems transformation. Key features include:

- use of geospatial, biophysical and socioeconomic data, alongside advanced analytics, to identify agroecological zones with high potential for agricultural transformation;
- cross-disciplinary partnerships with global research institutions;
- integration of economic, social and environmental dimensions of sustainable development;
- analysis of trade-offs between economic growth, social inclusion and biodiversity;
- blended finance mechanisms to support investment;
- multistakeholder collaboration across governments, donors, international institutions, the private sector and civil society;
- matchmaking stakeholders with funding, technology and capacity-building support;
- strong national ownership through country task force teams;
- monitoring and evaluation dashboards enabling real-time progress tracking and accountability;
- compliance with global standards for data privacy.

SCOPE (Analytical Support Mechanism to the Common Country Analysis (CCA) and UN Sustainable Development Cooperation Framework (UNSDCF))

This initiative provides analytical support and data to inform UN country programming on agrifood systems, while strengthening country-level technical expertise in systems analysis. It shifts programming from a one-time review to continuous, real-time analysis that reflects evolving country contexts.

The mechanism provides a holistic view by integrating quantitative and qualitative data from multiple sources, including big data, crowdsourced data, geospatial data and traditional datasets. It supports governments and partners in identifying priorities, aligning investments and designing policies through the application of systems-based analytical tools.

Food Safety Foresight Programme

The Food Safety Foresight programme provides evidence to policymakers and private sector actors on issues that may emerge over the medium to long term. It applies forward-looking techniques – such as horizon scanning, scenario building and Delphi surveys – to gather and analyse information and inform decision-making.

Rather than predicting the future, foresight approaches help stakeholders prepare for multiple possible scenarios. By monitoring global trends such as climate change, technological innovation and shifts in consumer behaviour, the programme provides early warnings and guidance to support proactive responses to emerging food safety risks.

Food Systems Countdown Initiative (2023–2030)

The Food Systems Countdown Initiative tracks changes across agrifood systems in over 100 countries, publishing annual updates based on national-level indicators. These indicators assess progress across five themes:

- diets, nutrition and health;
- environment, natural resources and production;
- livelihoods, poverty and equity;
- governance;
- resilience.

The initiative also incorporates additional indicators to address data gaps. As well as indicator-based analysis, it applies modelling techniques to examine interactions across indicators, domains and themes. This enables the identification of trade-offs and synergies, supporting a better understanding of the systemic nature of agrifood systems and helping to identify leverage points for intervention.

Monitoring and Analysing Food and Agricultural Policies (MAFAP)

The MAFAP programme applies a range of analytical and modelling tools to support countries in developing evidence-based agrifood policies aimed at achieving affordable and sustainable healthy diets. It supports governments, particularly in sub-Saharan Africa, to monitor agrifood policies by analysing public spending and price incentives for priority commodities.

An example is MAFAP's work in Rwanda, conducted in partnership with the Ministry of Agriculture and Animal Resources (MINAGRI). The programme focused on:

- monitoring and assessing price incentives for selected agricultural value chains;
- evaluating public expenditure in food and agriculture.

The analysis applied two key indicators:

- **Price incentives indicators**, including the Nominal Rate of Protection (NRP) and the Market Development Gap (MDG), to assess the impact of market and trade policies and inefficiencies on prices for farmers and wholesalers. The analysis covered rice, wheat, tea and coffee between 2005 and 2018.
- **Public spending indicators** to assess the level and composition of expenditure, identifying priorities and gaps between 2012 and 2018.

By combining price incentive analysis, public expenditure data and other secondary data sources, a policy coherence analysis was conducted to assess alignment between Rwanda's agricultural policies and national development objectives. The results provide evidence-based insights to support informed policymaking in agrifood systems.

SDG 2 Roadmap Initiative

The SDG 2 Roadmap initiative provides a systems-based framework to support countries in accelerating progress towards Sustainable Development Goal 2 (Zero Hunger), while recognizing interconnections across food security, nutrition, poverty, climate, biodiversity and livelihoods. The roadmap combines quantitative analysis with qualitative policy processes to help governments identify pathways for agrifood systems transformation.

Key features include:

- quantitative evidence, including trends, projections, indicators and modelling related to food security, nutrition, climate and agrifood systems;
- technical analysis with qualitative assessments of governance, institutional coordination and stakeholder engagement;
- transition pathways and roadmaps that sequence policy actions, investments and institutional reforms over time;
- emphasis on multistakeholder dialogue and country ownership to support nationally adapted pathways;
- support for aligning public investments, policies and financing strategies with long-term agrifood systems objectives;
- application of foresight and scenario-based approaches to help policymakers manage uncertainty and emerging risks;
- promotion of integrated monitoring frameworks to track progress across interconnected SDG 2-related outcomes.

Sources: Adapted from: **FAO**. n.d. The Hand-in-Hand Initiative. In: *HandInHand*. [Cited 8 December 2025]. www.fao.org/hand-in-hand/en; **FAO**. 2025. Analytical Support Mechanism to the Common Country Analysis and United Nations Sustainable Development Cooperation Framework Process. Rome; **FAO**. 2025. Foresight: Food Safety and Quality. In: *FoodSafetyQuality*. [Cited 8 December 2025]. www.fao.org/food-safety/scientific-advice/foresight/en; **Schneider, K.R., Remans, R., Bekele, T.H., Aytekin, D., Conforti, P., Dasgupta, S., DeClerck, F. et al.** 2025. Governance and resilience as entry points for transforming food systems in the countdown to 2030. *Nature Food*, 6(1): 105–116. <https://doi.org/10.1038/s43016-024-01109-4>; **FAO**. 2023. Achieving SDG 2 without breaching the 1.5°C threshold: A global roadmap, Part 1: How agrifood systems transformation through accelerated climate actions will help achieving food security and nutrition, today and tomorrow. In Brief. Rome, FAO. www.fao.org/interactive/sdg2-roadmap/assets/3d-models/inbrief-roadmap.pdf

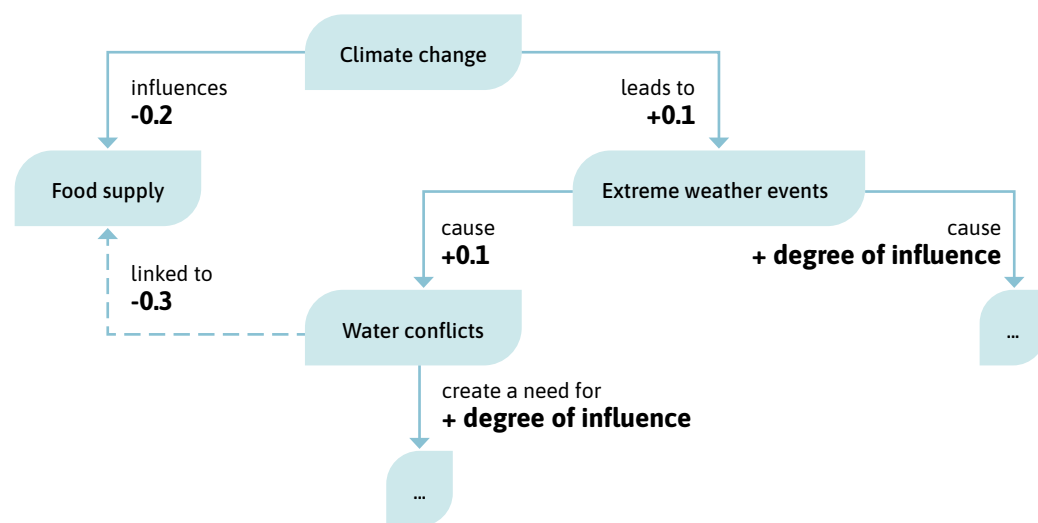


Participants engage in group work during an FAO training workshop.
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2.2.7 Fuzzy cognitive mapping

Fuzzy cognitive mapping traces the relationships between variables and assigns numerical weights to represent the strength of influence, based on qualitative inputs. It helps policymakers explore complex systems where data may be uncertain or incomplete, supporting hypothesis development. Figure 9 shows how the model can be used to map the cascading effects of climate change. The nodes (Climate Change, Food Supply) represent variables, and the lines show relationships. The numerals denote the degree of influence (positive/negative) between the variables.

Figure 9. Fuzzy Cognitive Mapping applied to map the cascading effects of climate change



Source: Adapted from Schünemann, C., Sidorova, A. & Herold, H. 2023. *Qualitative and quantitative modelling of the efficacy of policy instruments*. Dresden, German Environment Agency. https://www.umweltbundesamt.de/system/files/medien/11850/publikationen/42_2023_cc_qualitative_and_quantitative_modelling.pdf.

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Strengthening public sector leadership in agrifood systems policy and strategy development



Suggested duration: 3 hours

Presentation: 1 hour, split into three interactive sessions.

Learning Lab: 1.5 hours

Wrap-up and Q&A: 30 minutes

Module abstract

This module describes the increasing use of agrifood systems policies and strategies by countries to address interconnected challenges that cannot be managed effectively through sector-specific policies alone. Building on familiar strategy development tools and processes, it shows how a systems approach can strengthen cross-sectoral linkages and support shared objectives. Country experiences provide practical examples of operational tools, governance structures and coordination mechanisms that public institutions can adapt to design and implement agrifood systems strategies suited to their context. The module builds on FAO's *Transforming Food and Agriculture through a Systems Approach*.² It aims to strengthen public sector capacities to apply *Systems Governance* and *Systems Doing* in policymaking for agrifood systems transformation.

Learning objective

- Understand how agrifood systems strategy development builds on standard policymaking processes.
- Learn how to apply a systems approach to the development and implementation of agrifood systems strategies.

Learning Lab

Defining the task

Participants appraise the principles, tools, structures and mechanisms described throughout the module against their country's main agrifood policy. They discuss strengths and identify opportunities for improvement.

Activities

- Participants individually appraise the principles for designing agrifood systems strategies presented in [Section 3.3.1](#).
- In groups, participants compare their country's flagship or most comprehensive agrifood policy against these principles, identifying strengths and opportunities for improvement.
- Participants then appraise the tools, structures and mechanisms presented throughout the module (see [Section 3.3](#)).
- In groups, participants identify similar tools, structures and mechanisms used to facilitate the implementation of the selected agrifood systems policy – discussing what does and does not work, and proposing practical improvements.
- Groups present and discuss their findings.
- Facilitators highlight recurring patterns and innovative approaches.
- Facilitators can conclude the exercise by emphasizing that the workshop itself serves as a collaborative platform, bringing together participants from different organizations and sectors. Participants can be encouraged to leverage the opportunity to build connections, exchange ideas and create a shared understanding of the public sector challenges they are facing.

3.1 Key concepts – systems approaches applied to agrifood strategy development

To address the increasingly interconnected challenges facing agrifood systems, many countries are developing national agrifood systems policies and strategies that align sectoral policies, investments and stakeholders around shared objectives.^{1,2} These policies and strategies (hereafter referred to as agrifood systems strategies) are designed to account for interdependencies across the sectors involved in the transformation of agrifood systems including, among others, agrifood, fisheries, forestry, nutrition, health, trade, environment and social protection.^{1,2}

National agrifood systems strategies typically draw on existing public sector expertise and established strategy development tools.^a These include approaches used to define policy problems, gather evidence, engage stakeholders, set and monitor targets, and develop action and investment plans.⁵⁻⁹ Rather than introducing new methodologies, agrifood systems strategies build on existing and familiar planning tools and practices. The principal distinction between sector or sub-sector strategy development and agrifood systems strategies lies in how these tools are applied. Agrifood systems strategies place greater emphasis on shared strategic direction, cross-sectoral linkages, institutional interdependencies, and the alignment of mandates, resources and responsibilities across actors and sectors.

In practice, a systems approach in strategy design and implementation is reflected in the way operational tools, governance structures and coordination mechanisms are designed and used to strengthen coordination, alignment and coherence across sectors and stakeholders.^{3,4}

Many of these ideas are reflected in the policy design and public administration literature, including concepts such as policy coherence, policy mixes, policy portfolios and whole-of-government approaches.^{8,10-13} The boundaries between these concepts are not always clear and are often referred to interchangeably when discussing the coordination of policies across sectors and institutions. Nevertheless, they provide useful insights to enhance agrifood systems policymaking (see Box 10).^{8,10}

This module provides examples of national agrifood systems strategies from across several regions, followed by a set of principles that can guide strategy design and implementation. In addition to exploring examples of operational tools, governance structures and coordination mechanisms used to support a systems approach, the module also offers insights into the strengths and limitations of these tools. The country examples used to illustrate their application further demonstrate that no single tool, structure or mechanism is suited to all contexts.

Ultimately, the guidance provided in the module does not override or replace the need for sector-specific action, but is intended to complement sectoral measures.

^a The literature on policy strategies draws on business strategic management literature, for example by Porter (1980) and Mintzberg, Ahlstrand and Lamper (1999).

Box 10

Policy mixes, policy portfolios, whole-of-government approaches: Sample definitions and descriptions

- **Policy portfolios** are deliberate combinations of policy instruments used in coordination to address complex policy challenges and reduce reliance on single-sector solutions.ⁱ
- **Policy mixes** can be defined as a complex of interactions and trade-offs between various policies impacting the realization of policy goals in a specific context.ⁱⁱ
- **Policy integration** refers to “the process of making strategic and administrative decisions aimed at solving a complex problem. Solving this complex problem is a goal that encompasses – but exceeds – the programmes’ and agencies’ individual goals”.ⁱⁱⁱ
- **Whole-of-government approaches** refer to the active use of formal and/or informal networks across different government agencies to coordinate the design and implementation of a range of interventions.^{iv}

Sources: i. **OECD**. 2022. *Tackling policy challenges through public sector innovation: A strategic portfolio approach*. Paris. www.oecd.org/en/publications/tackling-policy-challenges-through-public-sector-innovation_052b06b7-en.html; ii. **Rogge, K.S. & Reichardt, K.** 2016. Policy mixes for sustainability transitions: An extended concept and framework for analysis. *Research Policy*, 45(8): 1620–1635. <https://doi.org/10.1016/j.respol.2016.04.004>; iii. **Cejudo, G.M. & Michel, C.L.** 2017. Addressing fragmented government action: Coordination, coherence, and integration. *Policy Science*, 50: 745–767. <https://doi.org/10.1007/s11077-017-9281-5>; iv. **OECD**, 2007 quoted in UN DESA (United Nations Department of Economic and Social Affairs). 2016. *Concepts, tools and experiences in policy integration for sustainable development*. Policy brief 1. New York. <https://ecosoc.un.org/sites/default/files/2023-03/desa-policy-brief-policy-integration-10.pdf>

3.2 Examples of national agrifood systems strategies

National agrifood systems policies and strategies are generally overseen by – and contribute to – higher-level national development strategies, which also help align a country’s main sectoral policies. In turn, these frameworks respond to regional and global programmes and commitments, such as the Comprehensive Africa Agriculture Development Programme (CAADP), the Common Agricultural Policy of the European Union and the 2030 Agenda for Sustainable Development. Box 11 presents the example of Rwanda’s national development plan, Vision 2050 – The Rwanda We Want.

Box 11

Example of national vision policy: Rwanda’s Vision 2050 – “The Rwanda We Want”

Rwanda’s Vision 2050 serves as an overarching framework integrating and aligning sectoral policies for health, education, agriculture, infrastructure and governance into a unified national development agenda. The programme harmonizes targets and indicators with national strategies (e.g. the [National Strategy for Transformation](#)) and global and regional commitments, such as the SDGs, African Union (AU) Agenda 2063 and the [East African Community \(EAC\) Vision 2050](#). Sectoral policies are nested within five core pillars: Human Development, Competitiveness and Integration, Agriculture for Wealth Creation, Urbanization and Agglomeration, and Accountable and Capable State Institutions. This ensures that each sector contributes coherently to the broader vision. Such an integrated approach enables consistent prioritization, coordinated investment and efficient monitoring across all sectors, promoting sustainable, inclusive and transformative development.

Source: **Ministry of Finance and Economic Planning, Republic of Rwanda**. 2020. *Vision 2050: The abridged version*. Kigali. www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf

National agrifood systems strategies or policies differ in scope, title and institutional form. Some are framed as food security policies or agriculture sector strategies, others as investment plans, programmes, pathways or national transformation agendas.¹⁴

Collectively they show an emerging shift towards treating agrifood systems strategies as long-term strategic frameworks for managing cross-sectoral objectives. Periodic revisions, often conducted every five to ten years, support their continuous learning and adaptation. Table 2 shares examples of national strategies that adopt a systems approach to coordinate multiple policy objectives and instruments across food security, climate change and livelihoods goals.

Table 2. National agrifood systems strategies incorporating features of a systems approach

Country	National agrifood systems strategy
Bhutan	Bhutan's development of the Food Systems Strategy 2034 aims to support agricultural development, increase market opportunities, and help the sector adapt to environmental and economic challenges. The strategy reflects a strong Systems Governance approach, bringing together farmers, (local) government officials, private sector representation, civil society leaders, and national and international partners to co-diagnose challenges and co-design solutions. The process embodies systems thinking, drawing on multilevel consultations and iterative feedback loops to establish a collective vision that recognizes the deep interconnections between food security, economic growth, climate resilience and social well-being. The resulting strategy sets out ambitious, interlinked objectives: trebling exports, enhancing commercialization and big data usage, increasing the sector's contribution to GDP, raising incomes and creating dignified employment, ensuring households are food-secure, and safeguarding ecosystems while reducing carbon emissions.
Costa Rica	Towards Sustainable and Healthy Agrifood Systems 2023–2026: From the field to the plate is Costa Rica's new national plan to advance sustainable and healthy agrifood systems. Priorities including strengthening commercialization via short supply chains, developing value-added and differentiated products, expanding research and technology transfer for sustainable production, and improving public policies that enhance access to healthy diets. The plan acts as Costa Rica's revised national pathway, proposing 21 actions to achieve multiple outcomes for agrifood systems transformation. The plan is grounded in Systems Thinking. It views food as an interconnected web of production, environment, markets and health, identifying leverage points across four main priorities, and reinforcing Systems Governance and Systems Learning through cross-sector collaboration, continuous monitoring and feedback loops. The Ministry of Agriculture and Livestock led the development process with the support of FAO, drawing on existing national policies, research and programmes. Engagement with a broad array of stakeholders was crucial. Consultations took place with other ministries, producers, traders and exporters, gastronomy specialists, Indigenous Peoples, rural organizations, agribusiness, academia, government institutions, NGOs, educators, technology providers and consumer groups, among others.
Ethiopia	Ethiopia's most recent comprehensive agrifood strategy is the National Agriculture Investment Plan (NAIP) 2021–2030, embedded within the national planning system and aligned with the Ministry of Agriculture's Ten-Year Perspective Plan (2021–2030) for the agriculture sector. The NAIP is comprehensive in scope, bringing together national priorities with regional CAADP commitments and the Sustainable Development Goals. Overseen by the Minister of Agriculture, the NAIP is structured around five Technical Committees covering: (i) agriculture, including extension, research and technology; (ii) livestock and crop development, including agropastoral systems; (iii) climate change and food security, encompassing watershed management and job creation; (iv) policy and governance; and (v) agricultural input and output marketing systems. In addition, the NAIP Secretariat coordinates cross-cutting areas through dedicated platforms, including the Nutrition Coordination Platform and the Private Sector Development Task Force. Critically, the NAIP is an investment plan for agrifood systems, formulated to guide investment decisions by the government in collaboration with development partners, the private sector and other non-state actors.

Ireland	Ireland's agrifood systems transformation agenda is guided by Food Vision 2030, the country's national strategy for the agrifood sector. The strategy seeks to position Ireland as a global leader in sustainable food systems and is implemented through interconnected actions across environmental sustainability, climate action, economic viability, innovation, nutrition and public health, rural development and international market development. Led by the Department of Agriculture, Food and the Marine and supported through a whole-of-government implementation framework, the strategy demonstrates a systems approach by bringing together stakeholders from government, industry, research institutions, farmers' organizations and civil society. It recognizes the interdependence of agricultural productivity, environmental sustainability, economic competitiveness and societal well-being. Through coordinated action across sectors, the strategy seeks to deliver multiple outcomes, including sustainable economic growth, reduced greenhouse gas emissions, strengthened biodiversity, improved water quality, enhanced rural livelihoods, innovation-driven competitiveness and increased access to healthy and sustainable food.
Sierra Leone	Feed Salone is Sierra Leone's national strategy to achieve food security and economic growth. The strategy is implemented through six pillars: mechanization and irrigation; seeds and input systems; aggregation, processing and marketing; access to finance; agricultural technology and climate smart agriculture; and empowering women and youth. Guided by the Presidential Council and implemented by the Ministry of Agriculture and Food Security, the strategy exemplifies Systems Doing, harnessing interconnections across agriculture, marketing, education, youth employment, governance and technology. The benefits that can arise – improved value chains, increased exports, enhanced climate change resilience, expanded school feeding programmes, new youth opportunities, and leveraged technology and innovation – contribute to reducing hunger and food insecurity.
Spain	The Spanish agrifood and fisheries sector is a major economic engine, driving employment, supporting rural and coastal development and contributing significantly to national exports. Spain's new National Food Strategy, developed under the leadership of the Ministry of Agriculture, Fisheries and Food, will guide the formulation of future agrifood public policies. Built on Systems Thinking, the strategy focuses on maximizing the sector's strengths, optimizing existing instruments and programmes, and aligning public policies to support a coherent and effective transition. Its development followed an inclusive and participatory process – a key element of Systems Governance. Actors from across the entire agrifood system participated in the process, ensuring that the strategy reflects diverse perspectives and shared priorities.

Sources: See [Notes](#) at the end of the module.

3.3 Design and implementation of agrifood systems strategies

A systems approach to agrifood systems strategy development builds on standard policy planning processes, described in Box 12, by placing more emphasis on coordination and collaboration across the interconnected parts of agrifood systems.^{1,2,15}

Countries combine and adapt a range of principles, operational tools, governance structures and coordination mechanisms when designing and implementing agrifood systems strategies. Each serves a distinct purpose. **Principles** guide strategy design and implementation and help align actors around shared objectives. **Operational tools** support the translation of strategy into action. **Governance structures** provide the institutional arrangements needed to oversee implementation across sectors and institutions. **Coordination mechanisms** enable actors to work together on a day-to-day basis in a coherent, adaptive and sustained manner. The following subsections examine each of these components in turn.

Box 12 Policymaking and strategy development processes defined

Public policy is a course of action chosen by public authorities to solve a problem or address an issue. Public policy is expressed in the body of laws, regulations and policy frameworks implemented through programmes and projects (FAO, 2015).

The **policymaking process** is a “political problem-solving process among constrained social actors in the search for solutions to societal problems – with the government as primary agent taking conscious, deliberate, authoritative and often interrelated decisions”. It is “shaped by socio-economic conditions, infrastructure and biophysical conditions, but also by culture and institutions”.ⁱ **Policy processes** refer to “all stages of the policy cycle, including problem identification, agenda setting, policy formulation, legitimization and adoption, implementation, evaluation or assessment, policy adaptation, succession and termination”.ⁱ

Key outputs of the policymaking processes include the following:

- The **policy strategy** outlines policy objectives and a combination of interdependent goals and means (policy instruments, government programmes) to achieve those goals.^{ii,iii} Strategies typically lay out long-term strategic goals substantiated by long-term quantifiable targets. The “strategy” is the output, while the strategy process defines the problem, sourcing and validating evidence to inform the strategy’s development. This includes consulting with stakeholders and revising objectives and plans, including investment plans, based on evaluations and evidence.ⁱⁱ
- **Policy instruments** refer to tools used to operationalize and implement the strategy’s objectives. They can take the form of:^{iv}
 - economic instruments such as grants to upscale more efficient technologies, subsidies for farm inputs and tax incentives;
 - regulation including laws to protect biodiversity or water, agrifood product labelling, and regulations on pesticide use;
 - capacity-building/communication programmes including training for women farmers or public advocacy campaigns to encourage healthy eating.
- **Policy implementation** refers to “arrangements by authorities and other actors for putting policy instruments into action”.^v Proper implementation mechanisms, resources and staff capacities are critical, particularly in the face of political resistance and path dependency. Without them, strategies and instruments will not achieve their stated policy objectives.ⁱ

Sources: i. Rogge, K.S. & Reichardt, K. 2016. Policy mixes for sustainability transitions: An extended concept and framework for analysis. *Research Policy*, 45(8): 1620–1635. <https://doi.org/10.1016/j.respol.2016.04.004>; ii. Bryson, J. & Bert, G. 2024. Why strategic planning is more important than ever. In: G. Bert & J. Bryson, eds. *Strategic planning for public and non-profit organizations: A guide to strengthening and sustaining organizational achievement*. New Jersey, Wiley; FAO. 2015. *Food and Agriculture Policy Classification*. FAPDA – Food and Agriculture Policy Decision Analysis. Rome. www.fao.org/fileadmin/templates/fapda/docs/FAPDA_policy_classification_April2015.pdf; iii. Mintzberg, H. 1987. The strategy concept I: Five Ps for strategy. *California Management Review*, 30(1): 11–24. <https://doi.org/10.2307/41165263>; iv. Bali, A.S., Howlett, M., Lewis, J.M. & Ramesh, M. 2021. Procedural policy tools in theory and practice. *Policy and Society*, 40(3): 295–311. <https://doi.org/10.1080/14494035.2021.1965379>; v. Nilsson, M., Zamparutti, T., Petersen, J.E., Nykvist, B., Rudberg, P. & McGuinn, J. 2012. Understanding policy coherence: Analytical framework and examples of Sector–Environment policy interactions in the EU. *Environmental Policy and Governance*, 22: 395–423. <https://doi.org/10.1002/eet.1589>

3.3.1 Principles underpinning the development of agrifood systems strategies

Principles are foundational in policy design theory as they link normative commitments to practical strategy choices.¹⁶ For the purpose of agrifood systems strategy development, the principles shared here serve as a set of norms, guiding governments on strategy prioritization and implementation. This helps ensure that policy choices remain consistent with long-term national objectives, even as specific instruments, investments and institutional arrangements evolve.¹⁷

The principles outlined in Table 3 draw on a range of institutional frameworks and strategy documents from international, regional and national organizations which advocate a systems approach to agrifood systems transformation.^{1, 2, 18-23} Collectively, these principles emphasize the importance of data-driven analysis, multistakeholder governance and policy coherence, and reflect the six elements of FAO's agrifood systems approach.²

Table 3. Principles for designing agrifood systems strategies

Principle	Practice
 Systems Thinking	
1. Shared national direction	Outlining a shared vision, informed by evidence-based data and multistakeholder engagement.
2. Sustainability and resilience	Integrating ecological, social, health and economic dimensions for systems transformation.
 Systems Knowledge	
3. Evidence-based decision-making	Grounding priorities, targets, investment plans and policy sequencing in data, diagnostics and systems analysis.
 Systems Governance	
4. Country-driven leadership and ownership	Ensuring high-level government leadership, commitment and national prioritization.
5. Inclusivity and partnership	Bringing private sector, civil society and local actors into governance, planning and accountability mechanisms.
 Systems Doing	
6. System-level coherence and impact	Coordinating and collaborating across components of agrifood systems (e.g. agriculture, health, trade and environment) to address interdependent challenges and ensure joint outcomes.
7. Experimentation and innovation	Piloting locally grounded initiatives and scaling up what works, while reducing systemic risks.
 Systems Learning	
8. Reflexivity and adaptive management	Embedding learning loops and evidence updates in a transparent manner, so strategies evolve with new data and experiences and in response to the dynamic changes in agrifood systems.
9. Transparency and monitoring	Building accountability mechanisms that track results, support learning, encourage trust and indicate if agrifood systems are evolving.
 Systems Investment	
10. Capacity and institutional strengthening	Investing in human and organizational systems to sustain long-term implementation.

Sources: See [Notes](#) at the end of the module.

Box 13 demonstrates how Finland's [Food System Vision 2030](#), a comprehensive national agrifood systems strategy, embodies a number of these principles.

Box 13 Finland's policy for agrifood systems transformation

Shared national direction – Systems Thinking

Finland's National Food Strategy 2040 – A land of happy food outlines “a shared long-term direction for developing Finland's food system driven by global challenges such as climate change, geopolitical instability and technological transformation. The aim is to build a proactive, sustainable and profitable food system that safeguards security of supply, reduces negative environmental impacts, strengthens biodiversity and promotes public health.”

Success through prioritization and capacities – Systems Investment

The strategy includes four goals: (i) profitability and fairness, (ii) security of supply, (iii) nature's carrying capacity, and (iv) food culture and well-being. The achievement of the strategy's goals will be supported by building strategic capabilities across all areas including: (i) advancing innovation and technology; (ii) investing in skills, learning and openness to change; (iii) boosting investment capacity; (iv) building collaborative ecosystems; and (v) turning public administration into a proactive enabler.

Multistakeholder engagement for strategic visions, action planning and delivery – Systems Governance, Systems Knowledge

“Every stakeholder in the food system shares responsibility for achieving these common goals”. Finland's shared direction was guided by a collective vision-building. This process involved over 3 000 stakeholders, and considered issues like food culture, safety, security, trade, consumption, competitiveness and climate change, as well as food policy developments in other countries. Insights were sought from key stakeholders through a variety of events organized in 2024. A kick-off event shaped the vision; the Farmari Agricultural Show collected views from farmers; a published draft vision elicited public comments; and an online survey gathered feedback from food sector students. Other events included a Rural Parliament, a Youth Environmental Summit and six regional tours that included consultations with subnational stakeholders.

The multistakeholder engagement process continued with workshops organized with the Association of Rural Advisory Centres, the Central Union of Agricultural Producers and Forest Owners, and rural youth. In addition, bilateral discussions were held with the Central Union of Agricultural Producers and Forest Owners Board, the Finnish Grocery Trade Association, students at the Seinäjoki University of Applied Sciences, and the Finnish Food and Drink Industries' Federation. Further events included a workshop organized at an AgriVentures event, a roundtable discussion for the retail sector, an open survey conducted via the Ministry of Agriculture and Forestry website (3 769 respondents), and a Strategy Hackathon (Strackathon) with the participation of six stakeholder groups. Following this extensive stakeholder engagement process, the draft strategy was presented to Parliament on 28 May 2025.

Experimentation and innovation – Systems Doing

Finland's innovation agency, [Sitra](#), drives experimentation by funding and implementing projects with private, public and civil sectors. The agency allocates a significant share of its budget to experiments and pilots. A recent example is the “**More than Food**” (*Enemmän kuin ruokaa*) pilot launched in 2021, which was motivated by the question: What if people relying on food aid had a real voice in policymaking?

In Finland, hundreds of organizations provide food aid, yet the root causes of food poverty persist, and the lived experiences of aid recipients seldom inform policy. The *More than Food* experiment set out to bridge this gap. The project team created “poverty reduction councils” – forums where food aid recipients, aid providers and municipal officials could meet regularly to facilitate dialogue and ensure that policymakers understand the on-the-ground reality of those receiving food aid. The pilot showed that structured dialogue can reduce polarization and generate concrete solutions. For instance, participants in the councils proposed that municipalities and the new “well-being service counties” set explicit poverty-reduction targets and action plans, treating poverty alleviation as a mandated responsibility.

Reflexivity and adaptive management – Systems Learning

Building off lessons learned and tools developed for the preceding strategy, [Food System Vision for 2030](#), the Ministry of Agriculture will conduct ongoing monitoring of the policy, tracking outcomes across all aspects of the agrifood system. A structured approach to monitoring Food2040 implementation will be outlined through a detailed implementation and tracking plan, due for release in 2026. The plan will list actions, timelines, responsible parties and progress indicators for each policy area – from primary production to export promotion. The tracking plan will also integrate SDG monitoring, where food-related goals (e.g. reducing food waste) form part of broader sustainability reporting and regular Voluntary National Reviews.

Transparency and monitoring – Systems Learning

A process called the **Common Food Table** also plays a key role in maintaining transparency and public accountability around implementation of Finland's Food strategy 2040. Through regular meetings, progress reviews and stakeholder communication, the Common Food Table has strengthened trust between government, civil society and the private sector, ensuring that policy implementation remains transparent, evidence-based and responsive to emerging challenges.

Sources: **Finnish Government.** 2025. *National Food Strategy 2040: A land of happy food*. Helsinki. <https://julkaisut.valtioneuvosto.fi/server/api/core/bitstreams/8728de50-3bd9-4568-b10e-70b5ae932751/content>; **Kugelberg, S., Bartolini, F., Kanter, D.R., Milford, A.B., Pira, K., Sanz-Cobena, A. & Leip, A.** 2021. Implications of a food system approach for policy agenda-setting design. *Global Food Security*, 28: 100451. <https://doi.org/10.1016/j.gfs.2020.100451>; **Ministry of Agriculture and Forestry.** 2020. *Ruokajärjestelmän yhteinen tulevaisuuskuva 2030 vahvistettu* [Shared vision for the food system 2030 confirmed]. In: *Valtioneuvosto*. Helsinki. [Cited 9 December 2025]. <https://valtioneuvosto.fi/-/1410837/ruokajarjestelman-yhteinen-tulevaisuuskuva-2030-vahvistettu>; **Sitra.** 2021. *Enemmän kuin ruokaa* [More than food]. In: *Sitra arkisto*. Helsinki. [Cited 9 December 2025]. <https://arkisto.sitra.fi/caset/enemman-kuin-ruokaa>; **Sitra.** 2022. *Sitra's Annual report 2021 – Three future themes and dozens of experiments across the country*. In: *Sitra*. Helsinki. [Cited 9 December 2025]. www.sitra.fi/en/news/sitras-annual-report-2021-three-future-themes-and-dozens-of-experiments-across-the-country; **Sitra.** 2023. *These ideas for Web 3.0 experiments caught our attention: Virtual culture, sports and sustainable food consumption*. In: *Sitra*. Helsinki. [Cited 9 December 2025]. <https://arkisto.sitra.fi/en/news/these-ideas-for-web-3-0-experiments-caught-our-attention-virtual-culture-sports-and-sustainable-food-consumption>



Participant presents the results of a group exercise during a workshop.

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3.3.2 Operational tools to support strategy implementation

A robust strategy development process aligned with core principles provides a strong foundation for a successful agrifood systems strategy. But evidence shows that a strategy document alone is not sufficient to ensure effective implementation.²⁴ Delivery may still be constrained by conflicting agendas, fragmented mandates and limited operational capacities across institutions.²

Tools and capacities that help governments respond to evolving agrifood systems dynamics are essential to managing the interdependent policy objectives, instruments and resources that comprise agrifood systems strategies.

Central to these tools are the processes of coordination and collaboration. As these terms are often used interchangeably, it is useful to distinguish between their respective functions (see Box 14).

Box 14 Coordination and collaboration

Coordination ensures that diverse actors and sectors – each with their own mandates, programmatic priorities and investments – are working in alignment towards shared goals. Even as different parts of the system operate independently (e.g. agriculture, health, trade, environment), coordination ensures their efforts are complementary and mutually reinforcing.

Collaboration goes beyond coordination. It involves not only aligning policies, but actively engaging across institutional boundaries to co-develop solutions, share knowledge and resources, and implement interventions in a concerted and strategic manner. Whether through face-to-face meetings, information sharing or joint activities, the goal of collaboration is to promote mutual learning, strengthen inter-organizational trust, build ownership of reforms and find common ground on shared objectives.

Sources: Adapted from Ansell, C. & Gash, A. 2008. Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4): 543–571; Hinds, R., Raeburn, A., Bowman, T., Mitchell, E., Whitaker, M. & Valdes-Dapena, C. n.d. *An executive's guide to high-value collaboration*. San Francisco, Asana. <https://asana.com/resources/high-value-collaboration-report>; Peters, B.G. 2018. The challenge of policy coordination. *Policy Design and Practice*, 1(1): 1–11. <https://doi.org/10.1080/25741292.2018.1437946>

Table 4 shares examples of operational tools, including for instance *policy mapping*, which can be combined with systems diagnostics to develop a shared understanding of the policy landscape across sectors and levels. Complementary instruments and resources can be *bundled and sequenced* to enhance coherence and efficiency. *Technical and procedural tools* can be used in a balanced manner to ensure solutions are both technically sound and implementable. These tools can be applied at multiple scales – regional, national and urban.

Table 4. Operational tools for managing the implementation of interdependent policy objectives, instruments and resources

Policy objective	Operational tools	Example
1. Establish a shared vision and strategy		
Align all actors and initiatives around a <i>shared goal</i> , preferably one that is “targeted, measurable and time-bound.” ⁱ Setting clear and quantifiable targets helps to attract long-term investments and motivates stakeholders to collaborate around a common challenge.	Multistakeholder dialogues; inter-ministerial coordination platforms; shared results frameworks (see Module 4 on engaging stakeholders for more examples of operational mechanisms).	Ethiopia’s Food Systems Pathway Commitment and Position Statement , developed in a multistakeholder setting, provides a common vision. It combines the goals of existing strategies such as the Seqota Declaration to end childhood stunting (2015), the National Nutrition Sensitive Agriculture Strategy (2017), the Green Legacy Initiative (2019) and the Homegrown Economic Reform Agenda (2020). ⁱⁱ
2. Create a visual policy landscape		
Map ongoing and planned initiatives across ministries (agriculture, trade, health, environment, etc.) to see how they interact, identifying duplication, gaps or unintended trade-offs.	Policy mapping; system diagnostics; policy interaction matrices; institutional and network mapping (see Module 2 for more examples of operational mechanisms).	A guide on integrated planning was developed for the Africa region to map overlapping agendas, identify synergies and trade-offs across policies and sectors, and align national development plans with continental and global frameworks. ⁱⁱⁱ
3. Bundle instruments and resources		
Bundle related measures (e.g. subsidies, incentives, R&D, regulation and social programmes) into complementary clusters that share the same goals. ^{iv} Examples include aligning agricultural innovation policies with nutrition and climate objectives, or business and financial services for agrifood enterprises with services for non-agrifood enterprises.	Bundled investment programmes; cross-sectoral project pipelines; aligned budgeting (see Module 6 on investment for more examples of operational mechanisms).	In Nigeria, the Policy Optimization Tool (PolOpt) is used to optimize public spending for the country’s National Agrifood Systems Investment Plan. The tool contributes towards more efficient public spending, and enhanced alignment between agricultural, nutrition, environmental and economic goals.
4. Sequence interventions strategically		
Sequence the roll-out of programmes so that enabling policies (e.g. infrastructure or capacity building) precede or reinforce more targeted interventions, ensuring foundations are in place before new initiatives are scaled. ^v For instance, if the objective is to establish a national food reserve, it is essential to ensure that support to value chain logistics, productivity, warehouse receipt mechanisms, access to finance and procurement procedures, are all in place to ensure sufficient and timely supplies of grain for newly constructed silos.	Phased implementation plans; sequencing matrices; joint sector planning; coordination between ministries and institutions (see Table 4 for more examples of national-level mechanisms that strengthen joint sector planning and sequencing).	In Rwanda, the Joint Sector Review (JSR) brings together all Sector Working Group stakeholders, including development partners, civil society and the private sector. The JSR aims to strengthen policy dialogue, ownership and transparency in the implementation and monitoring of national medium-term development plans. In the agriculture sector , the JSR, led by the Ministry of Agriculture and Animal Resources (MINAGRI), monitors the progress of the national agrifood systems strategy (PSTA5), identifying priorities for the upcoming fiscal year. It also contributes to preparation of the country’s CAADP biennial review in line with the Malabo Declaration.

5. Balance technical and procedural tools

Balance substantive tools (e.g. grant or tax incentives, piloting new production technologies, updating environmental standards and regulations) with procedural tools (e.g. stakeholder platforms, learning forums or managing multistakeholder steering committee), so that policy design is technically sound and socially grounded, based on solutions that are efficient and implementable. ^{vii}	Incentives, standards and regulations (technical); stakeholder platforms, learning forums, mission/portfolio boards (procedural) (see Table 6 for more examples of national-level mechanisms that strengthen coordination and collaboration between technical and procedural instruments).	Korea's National Green Growth Strategy ^{viii} blends technical and procedural tools. On the technical side, it has created a national cap-and-trade Emissions Trading Scheme (ETS) to price carbon, backed by the Framework Act on Low Carbon Green Growth. Prior to the ETS, a Target Management System set mandatory emissions caps for large emitters and helped build the monitoring, reporting and verification capacities needed for emissions trading. The strategy also uses fiscal incentives such as tax credits, public credit guarantees and a Low-Carbon Green Fund, to spur green technology deployment and private investment, alongside major R&D spending on core green technologies. Procedurally, results are tracked with third-party review, while a national registry ensures transparent emissions data and compliance. A Presidential Committee on Green Growth, interministerial task forces and stakeholder consultations with industry and civil society, also oversee phased "rehearsal" rollouts, coordinate decisions, support learning by doing and adjust rules over time. ^x
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6. Pilot, learn and adapt policies

Experiment by piloting different combinations of policies on a smaller level before scaling up (for more details see Module 5). Monitor the results and cross-fertilize sectoral data, evaluations and stakeholder dialogues across ministries. Coordinated adjustments can be made during implementation instead of waiting for end-of-cycle reviews. ^{x-xii}	Safe-to-fail pilots; prototypes; joint monitoring and evaluation; learning cycles; coordination and reflection workshops (see Module 5 on policy innovations for more examples).	Ireland's Agri-Food Strategy, now known as FoodVision 2030 , is the newest in a rolling series of strategies that builds upon the achievements of its predecessors. Monitoring of actions is assigned to public organizations and private bodies, with a High Level Implementation Committee (HLIC) overseeing progress. When delivery is slow, the respective units are called upon to justify target delays. The HLIC is chaired by the Minister of Agriculture, Food and the Marine, and consists of CEOs from public and private organizations. This structure ensures sufficient authority to refine the strategy as new information comes to light. ^{xiii} The strategy is therefore a living document reacting and adapting to changing circumstances.
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7. Monitor the portfolio as a system

Monitor single policies and programmes together to assess whether productivity, nutrition, inclusion and environmental outcomes are advancing cohesively or in competition. ^{xiv, xv}	System-level monitoring frameworks; cross-sector indicators; coherence reviews; portfolio performance assessments (see Module 5 on policy innovations for more examples).	In the Armenian town of Areni, local authorities monitor a portfolio of interconnected policy instruments for sustainable tourism. The portfolio covers urban infrastructure improvements, waste management, community engagement, town branding, investment attraction and leadership training. Tools such as regular learning logs and sensemaking sessions with municipal teams and stakeholders help assess how community engagement, infrastructure, service provision and investment attraction interact in practice. This systems-level monitoring enables continuous adjustment of interventions in response to emerging evidence and changing local conditions, strengthening coherence and system-wide impact. ^{xvi, xvii}
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Sources: See [Notes](#) at the end of the module.

3.3.3 Governance structures for strategy implementation

Governance structures underpinning agrifood systems strategies guide who makes decisions, how priorities are negotiated, how resources are allocated, and how implementation is monitored across the different parts of government involved in agrifood systems.^{25, 26} They include formal structures such as interministerial committees, cabinet-level coordination bodies, technical working groups, delivery units and dedicated secretariats.

While some structures can be designed to align policies and budgets with national priorities, others may focus on driving implementation and innovation. Each structure can involve trade-offs related to accountability, flexibility and sustaining implementation over time – an important consideration given the constantly changing nature of agrifood systems. In practice, countries often combine multiple governance structures to address these variables.

Table 5 presents examples of governance structures used to manage the delivery of agrifood systems strategies across multiple institutions, highlighting their respective strengths and limitations.

Table 5. Typologies of governance structures for agrifood systems strategy delivery

Type	Description	Strengths	Limitations
Central agencies including the Office of the Prime Minister, central planning agencies and ministries of finance (e.g. the Public Policy Secretariat Serbia or the Ministry of National Development Planning (Bappenas), Indonesia).	Organizations responsible for promoting alignment among national priorities, through budget allocations and legislation.	→ Easier to align with national strategies and ensure accountability through government budget oversight.	→ Subject to bureaucracy. → Weak connections with civil and private sectors. → Mostly fit for coordinating and less suitable for facilitating collaboration.
Multisectoral agencies with high autonomy (e.g. Fundacion Chile , Sweden's Vinnova , Ethiopia's Agricultural Transformation Agency).	Government agency but with autonomy and flexibility to obtain funding from multiple sources (e.g. donors or the private sector).	→ Open to innovation. → Flexible operating rules. Able to hire high-calibre staff with innovation skills and knowledge of relevant sectors. External financiers with vigorous M&E can foster better governance. → Less vulnerable to electoral cycles and public budgets. → Links with private or civil sectors.	→ Requires buy-in from the sectors involved. → Risks remaining disconnected from the wider public sector. → Higher salaries can undermine public sector capacity by attracting government personnel.
Delivery units (e.g. PEMANDU in Malaysia).	A small team of experts usually located within the office of the chief executive (President, Prime Minister).	→ Clear remit with a small number of priority areas. → Focuses specifically on implementation. → Access to high-level decision makers.	→ Subject to bureaucratic and public budget constraints. → Vulnerable to political changes. → Requires establishing relationships with decision makers across government.
Multistakeholder entities such as policy councils or committees (e.g. National Council for Food and Nutrition Security Brazil, CONSEA).	Governance structure that brings together diverse stakeholders to focus on a specific priority.	→ Combines resources from different stakeholders. → Involves civil society, improving the credibility of policies. → Can be used as a way to engage with the private sector.	→ Difficult to assign accountability → Difficult to find alignment across multiple stakeholder agendas and approaches. → Time and resource-intensive.

Sources: Adapted from [Aridi, A. & Kapil, N. 2019. Innovation agencies: Cases from developing economies. Washington, DC, World Bank. <https://doi.org/10.1596/32675>](#); [Lindquist, E. 2006. Organizing for policy implementation: The emergence and role of implementation units in policy design and oversight. *Journal of Comparative Policy Analysis: Research and Practice*, 8\(4\): 311–324. <https://doi.org/10.1080/13876980600970864>](#); [Peters, B.G. 2018. The challenge of policy coordination. *Policy Design and Practice*, 1\(1\): 1–11. <https://doi.org/10.1080/25741292.2018.1437946>](#); [Resnick, D. 2020. The political economy of agricultural policy in Africa: Implications for agrifood system transformation. In: D. Resnick, X. Diao & G. Tadesse, eds. *ReSAKSS Annual Trends and Outlook Report: Sustaining Africa's agrifood system transformation: The role of public policies*, pp. 175–181. Washington, DC, IFPRI.](#)

Box 15 on the case of Belo Horizonte's Municipal Secretariat of Food and Nutrition Security (SMASAN) in Brazil provides insights on critical success factors related to cross-sectoral planning.

Box 15

The case of Belo Horizonte's Municipal Secretariat of Food and Nutrition Security (SMASAN)

Belo Horizonte, the capital city of the Brazilian state of Minas Gerais, has been praised internationally for its cross-sectoral planning, which has helped to elevate "the right to food" on ministerial agendas.

Governance structure

In 1993, the former mayor of Belo Horizonte created a Municipal Secretariat of Food and Nutrition Security (SMASAN) to consolidate all policies and programmes related to food security. SMASAN was initially a stand-alone municipal agency reporting directly to the mayor, but in 2011 it became a sub-division under the Department of Social Policies. Today, it comprises over 180 civil servants and its director is appointed by the mayor.

Success factors

Critical factors in its success include a central location within the city government, which delivered a clear message on the importance of food and nutrition security. The backing of the mayor was also an essential factor, reinforcing the legitimacy of SMASAN and helping it acquire funding in a context of limited resources and competing priorities between municipal departments.

Competent and committed staff

The first director was an expert in food security who then assembled a team of knowledgeable and skilled staff. The longevity and success of Belo Horizonte's strategy is rooted in the commitment and values of these civil servants who design and implement the programmes. SMASAN has demonstrated this commitment through their continuous pursuit of quality. For instance, the staff place great importance on ensuring the nutritional content of meals provided within programmes, and the cleanliness and presentation of products in retail units it supports.

Multistakeholder and cross-sectoral collaboration

Programmes are designed around five core guiding principles: the right to food, food safety, food quality, social justice and inclusivity. These principles guided multistakeholder partnerships with businesses, producers, consumers and policymakers, addressing specific needs of communities and areas of development.

SMASAN's management processes are based on strong horizontal and vertical coordination linkages. For instance, Belo Horizonte's School Meals Programme, an example of an extremely successful initiative, provides nutritious school meals to over 155 000 students. The School Meals Programme relies on partnerships with the Ministry of Education for federal funding, which covers the cost of food, and with municipal governments for funding that covers infrastructure (e.g. storage) and personnel (e.g. cooks and nutritionists) costs. This programme is closely interlinked with the "Straight from the Countryside" initiative, ensuring that 30 percent of school meals are sourced from local farmers.

In addition to partnering with the Ministry of Education, the city has also benefited from cooperation with the Ministry of Social Development, which provides funds for infrastructure including the construction or renovation of restaurants.

Learning and adaptation

SMASAN emphasizes the importance of learning from experience and failures, and adapting or discontinuing programmes accordingly. One example is the "Preventing and Fighting Malnutrition" programme, introduced in the early 1990s in response to evidence showing that 18 percent of children below the age of 5 years in the

city were malnourished. The programme distributed flour enriched with vitamins and minerals through health clinics to pregnant and nursing women. While initially successful in reducing malnutrition, a cost-benefit analysis revealed that the high costs of flour distribution outweighed the benefits as malnutrition rates declined. As a result, the programme was discontinued. This approach highlights the importance of continuous evaluation and adaptation in policymaking to ensure that interventions remain both effective and economically viable.

The success of SMASAN's food and nutrition programmes has had a significant local impact. Businesses are able to sell their produce at fair rates, food has become more accessible to all, and the health of the district has improved drastically with a "50 percent drop in infant mortality and malnutrition since its implementation", according to a 2009 study by Johnson-Chappel. There is also evidence that the food security programmes have resulted in positive spillovers including in terms of biodiversity conservation.

The experience of Belo Horizonte also demonstrates that dedicating a small proportion of a city's annual budget (2 percent in this case) towards food security can make an important difference and transform attitudes toward sustainability.

Sources: **Future Policy**. 2020. Belo Horizonte's food security policy. In: futurepolicy.org. [Cited 9 December 2025]. www.futurepolicy.org/food-and-water/belo-horizontes-food-security-policy; **Hawkes, C. & Halliday, J.** 2017. What makes urban food policy happen? Insights from five case studies. Brussels, International Panel of Experts on Sustainable Food Systems. <https://openaccess.city.ac.uk/id/eprint/19325>; **Johnson-Chappel, J.** 2009. Can food security support biodiversity? Evidence from Belo Horizonte, Brazil. 94th ESA Annual Convention, Albuquerque, NM, 2–7 August 2009. www.researchgate.net/publication/267285687_Can_food_security_support_biodiversity_Evidence_from_Belo_Horizonte_Brazil; **Rocha, C. & Lessa, I.** 2010. Urban governance for food security: The alternative food system in Belo Horizonte, Brazil. *International Planning Studies*, 14(4): 389–400. <https://doi.org/10.1080/13563471003642787>

3.3.4 Mechanisms to strengthen inter-institutional collaboration across government

The governance structures discussed above provide examples of institutional foundations that can be put in place to oversee the design and implementation of agrifood systems strategies. The effectiveness of these structures in supporting a systems approach depends not only on their formal mandates, but also on the mechanisms that enable the coordination of day-to-day operations. These mechanisms can include joint planning processes, shared monitoring systems, pooled budgets and regular coordination meetings. Their purpose is not simply administrative as they can also manage interdependencies, trade-offs and sequencing challenges that arise when multiple sectors influence agrifood systems strategies simultaneously.²⁶

Similar to operational tools and governance structures, coordination and collaboration are rarely achieved through a single mechanism. Governments tend to combine tools and approaches, such as formal mandates, shared performance frameworks, data platforms, experimentation and joint learning.

While each approach has strengths and limitations, their effectiveness depends on a number of enabling conditions. These include high-level political support,²⁷ adaptable legal and administrative frameworks, supportive political and organizational cultures and sufficient institutional capacity to carry out coordination functions (see Module 7 on building capacities to transform systems).

Table 6 shares a selection of mechanisms designed to improve inter-institutional collaboration. They range from formal arrangements that clarify roles, responsibilities and accountability, to softer instruments that incentivize joint action, support information sharing and build trust across institutions. The examples shared contribute to strengthening coordination and collaboration across governments and with non-state actors (see Module 4 for more insights and tools related to multistakeholder collaboration).

Table 6. Examples of mechanisms that strengthen inter-institutional coordination and collaboration

Practice	Example
Selecting and designing governance structures Different governance structures can facilitate coordination and collaboration across sectors, each presenting distinct strengths and limitations (see Table 5 for an overview of selected typologies). Hybrid models also exist enabling governments to combine structures to address specific cross-sectoral issues.	SMASAN in Belo Horizonte, Brazil is a specialized government unit that centralizes and coordinates all food-related policies and programmes in the city. It functions as an autonomous multisectoral agency with a dedicated structure, budget and cross-sectoral remit, but also has the features of a central coordination unit integrating different policy areas and ensuring coherence (for more details see Box 15). The Republic of South Sudan Food Security Council (RSSFSC) presents another example of public cross-sectoral coordination. The RSSFSC aligns food security initiatives across ministries, providing strategic guidance for national policies and programmes. The Council is chaired by the President, with the Minister of Agriculture, Forestry, Cooperatives and Rural Development acting as Secretary. A General Secretariat and a Technical Steering Committee bring together government agencies, NGOs and international partners to develop a national framework for food and nutrition security. The technical arm of the Council, the Food Security Technical Secretariat, housed within the National Bureau of Statistics, compiles and analyses data to inform decisions.ⁱ
Tools that make responsibilities explicit and ensure actors remain accountable^{ii-iv} Memorandums of Understanding (MoUs) outline roles and responsibilities, clarifying how resources or decisions are shared. Performance management frameworks help track and evaluate how organizations contribute to shared goals.	Agriculture and Agri-Food Canada (AAFC) and Health Canada signed an MoU to address interrelated challenges related to regulatory inefficiencies, access to veterinary drugs, novel foods and reduced-risk pesticides. The MoU sets out roles and working relationships, performance indicators, funding commitments and reporting arrangements.^v Rwanda's Imihigo performance management framework strengthens public sector transparency and accountability, with all ministries and agencies required to sign <i>Imihigo</i> performance contracts. Initially implemented at the district level, <i>Imihigo</i> now links local development targets with national priorities. Plans are reviewed by a Technical Team comprising representatives from the Ministry of Local Administration and the Ministry of Economic Planning and Finance. Performance is reviewed annually, publicly announced and assessed using a colour-coded system (<i>green, yellow, red</i>). The system has improved results in sectors such as agriculture, health, education and infrastructure.^{vi-viii}
Mandating collaboration^{ix-x} Mandating collaboration can be a powerful incentive for public organizations to work together, particularly when funding incentives for cross-institutional partnerships exist. The effectiveness of such collaborations depends on pre-existing trust and institutional relationships.	Ireland incorporates collaboration into the mandates of agrifood organizations. Specifically, collaboration is built into the mandates of the Food Safety Authority of Ireland (FSAI), Teagasc (the Agriculture and Food Development Authority) and Bord Bia (the Irish Food Board). FSAI's strategic goals include to "work with Government, State agencies, and our partners, to ensure that food safety and authenticity is prioritised" and to "identify and work with the relevant Government Departments, State bodies and others to strengthen food safety and the protection of public health throughout the agrifood chain."^{xi} Likewise, the strategy of Bord Bia's strategy aims to "define and formalise strategic partnerships and deeper relationships to holistically collaborate with our customers and other agencies."^{xii}

Information-sharing platforms, paired with rules or legal mandates^{xiii} Digital dashboards or platforms can enable organizations across sectors to share data and track progress on shared objectives. Pairing them with clear rules or legal mandates also incentivizes collaboration, and improves data quality and accountability.	India's Food Safety Compliance System is a digital platform serving as a one-stop shop for citizens and agrifood businesses, while functioning as a single access point for regulatory authorities to coordinate actions on food safety. It centralizes statistics and information for all public organizations involved in compliance and policymaking.^{xiv} Chile mandates data exchange and information sharing through <i>Decreto Supremo No. 160</i>. This requires organizations to collect and exchange data to coordinate services across sectors such as social protection, health and education. The decree has “the objective of assigning and rationalising social benefits distributed by the State, as well as researching and designing policies, plans, programs ... based on the needs of those who administer such benefits, so as to promote a correct targeting of resources and the incorporation of beneficiaries in existing Social Safety Nets and ensuring access to better life conditions.” (MIDEPLAN 2007, art. 4).^{xv}
Small pilot projects or experimental initiatives^{xvi} Organizations working together on a smaller scale builds trust and lays the groundwork for deeper collaboration in the future (see Module 5 for more guidance on piloting and prototyping).	Vinnova, Sweden's innovation agency, runs experiments that bring different parts of government together to address shared challenges (e.g. food waste, resource efficiency). By piloting surplus food redistribution systems, agencies across agriculture, health and environment can collaborate and learn together.^{xvii}
Cross-departmental exchange programmes Staff spending time in different departments helps to break down silos and encourage more coordinated ways of working while building skills and networks.	The UK Government Interchange Scheme, launched in 2015, offers civil servants the opportunity to work-shadow counterparts in different administrations, including the Scottish and Welsh Governments. Over 500 participants have taken part, strengthening collaboration on cross-cutting issues, including agrifood systems.^{xviii}
Shared training and peer-to-peer learning programmes^x Joint training for staff from multiple departments working on interrelated agrifood topics can boost skills and strengthen relationships. Peer-to-peer learning platforms allow participants to share insights and build a sense of agency to make change.	Rwanda's “Policymaking for Agrifood Systems Transformation” Learning Programme brought together representatives from ten institutions, including the Ministry of Agriculture and Animal Resources (MINAGRI), the Ministry of Finance and Economic Planning (MINECOFIN), the Ministry of Education and the Ministry of Local Government (MINALOC), to analyse the draft version of Rwanda's Strategic Plan for Agriculture Transformation 2025–2030 (PSTA 5). Policy-mapping exercises helped clarify how ministries share responsibilities in managing agrifood system policies.^{xix}

Sources: See [Notes](#) at the end of the module.

3.4 Strengths and limitations of a systems approach in agrifood systems strategy development

The operational tools, governance structures and coordination mechanisms discussed above collectively aim to strengthen policy coordination, reduce fragmentation, and foster a shared sense of purpose across public institutions and specialized units working on agrifood systems.

However, their success in contributing to the transformation of agrifood systems can also be hampered by structural limitations and trade-offs inherent to cross-sectoral policymaking –

including tensions around budget control, visibility and sectoral mandates. This is particularly the case where ministries are evaluated against narrowly defined performance targets.¹²

Efforts to improve policy coordination across agrifood systems can risk diluting technical specialization or blurring lines of accountability, especially if roles and responsibilities are not clearly defined. Similarly, expanding collaboration across multiple institutions can increase coordination costs, create ambiguity around responsibilities and slow-down decision-making.

The effectiveness of these tools depends not only on their formal design but also on leadership's commitment, clearly articulated responsibilities and governance arrangements that manage to balance coordination with institutional autonomy.^{10, 12} Table 7 summarizes a number of strengths and limitations associated with cross-sectoral and cross-institutional collaboration.

Table 7. Strengths and limitations of cross-institutional collaboration

	Strengths	Limitations
Resource efficiency	Reduces duplication of efforts and streamlines public resources.	Government resources are scarce, and ministries need to protect budgets, visibility and expertise.
Policy coherence	Reduces silos and minimizes investments in policy priorities that may be working at cross-purposes.	May weaken institutional and sectoral specializations that ensure technical depth and accountability for areas such as food security, population health, biodiversity and trade.
Strategic policy design	Policies reflect shared government priorities and are responsive to complex, interconnected challenges.	Strategic policy design may remain fragmented when institutional mandates, targets and performance frameworks are defined along sectoral lines, discouraging the development of integrated policies and collaboration across institutions on shared or interrelated goals.
Institutional trust and ownership	Fosters trust across public-sector institutions and builds ownership of reforms and outcomes.	Involvement of too many institutions across multiple sectors and disciplines may create confusion and weaken ownership and accountability if not well coordinated.
Public legitimacy and communication	Communicates the message of a more competent public sector to the general public, front-line policy implementers, beneficiaries, investors and public sector donors.	Accountability can be weakened, as it becomes more difficult to attribute results and identify what is or is not working when policies span multiple sectors.

Sources: Adapted from: **Cejudo, G.M. & Michel, C.L.** 2017. Addressing fragmented government action: Coordination, coherence, and integration. *Policy Sciences*, 50(4): 745–767. <https://doi.org/10.1007/s11077-017-9281-5>; **Meijers, E. & Stead, D.** 2004. Policy integration: What does it mean and how can it be achieved? A multi-disciplinary review. In: *Berlin Conference on the Human Dimensions of Global Environmental Change: Greening of Policies – Interlinkages and Policy Integration*. Delft Institute of Technology. <https://ngfrepository.org.ng:8443/jspui/bitstream/123456789/2463/1/POLICY%20INTEGRATION%3B%20WHAT%20DOES%20IT%20MEAN%20AND%20HOW%20CAN%20IT%20BE%20ACHIEVED%3B%20A%20MULTI-DISCIPLINARY%20REVIEW.pdf>; **Peters, B.G.** 2018. The challenge of policy coordination. *Policy Design and Practice*, 1(1): 1–11. <https://doi.org/10.1080/25741292.2018.1437946>; **Rogge, K.S. & Reichardt, K.** 2016. Policy mixes for sustainability transitions: An extended concept and framework for analysis. *Research Policy*, 45(8): 1620–1635. <https://doi.org/10.1016/j.respol.2016.04.004>; **Stead, D. & Meijers, E.** 2009. Spatial planning and policy integration: Concepts, facilitators and inhibitors. *Planning Theory & Practice*, 10(3): 317–332. <https://doi.org/10.1080/14649350903229752>

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Engaging multiple stakeholders in policymaking processes



Suggested duration: 4 hours

Presentation: 2 hours

Learning Lab: 1 hour, 30 minutes

Wrap-up and Q&A: 30 minutes

Module abstract

This module examines the role of multistakeholder engagement in the design and implementation of agrifood systems strategies. It outlines key principles for identifying and engaging stakeholders, addressing power asymmetries through capacity strengthening, and designing institutional arrangements and facilitation processes that support meaningful engagement. Drawing on practical examples, the module illustrates how broad stakeholder engagement can strengthen policy design and implementation while supporting sustainable agrifood systems transformation. This module builds on tools and learnings from the FAO-UNEP-UNDP publication *Rethinking our food systems: A guide for multi-stakeholder collaboration*¹. The module also builds on FAO's *Transforming Food and Agriculture through a Systems Approach*.² It aims to strengthen public sector capacities to apply *Systems Governance* in policymaking for agrifood systems transformation.

Learning objectives

- Describe the benefits and risks of stakeholder engagement in policymaking, including challenges related to power imbalances, stakeholders' capacities, representation and conflicting interests.
- Learn to identify and map key stakeholders relevant to specific policy issues.
- Identify practical ways to help sustain stakeholder engagement in decision-making.

Learning Lab

Defining the task

Participants develop a stakeholder engagement plan for agrifood policymaking based on an existing policy or programme.

Activities

- In small groups, participants select a policy, programme or project related to their agrifood system.
- Using Figure 10 as a guide, participants map all of the stakeholders relevant to the policy or programme.
- Using Box 22 as an example, participants design a stakeholder engagement plan that (i) identifies and maps stakeholders; (ii) strengthens the capacities of stakeholders to engage; and (iii) designs structures to support results-oriented policymaking.
- The groups present their findings to the rest of the participants in a group session.
- The participants are encouraged to provide feedback to their peers on the feasibility and long-term sustainability of the strategies, and any power imbalance considerations.
- Summarize the key takeaways from each group's presentation, emphasizing any key challenges or innovations they have conceived.
- Clarify that there is no standard approach to stakeholder engagement.

4.1 Key concepts – the role of multistakeholder engagement in designing a policy design and implementation process

Broad stakeholder engagement is essential when designing a policy design and implementation process to address the complex problems facing agrifood systems. This includes engaging with government institutions, marginalized groups, agrifood enterprises, farmer organizations, educators, finance institutes, researchers and civil society.

Each of these stakeholder groups can contribute unique and valuable resources to the policymaking process. For example, governments can provide legislative frameworks, agrifood businesses can bring innovation and investment, academic institutions can contribute capacity building and evidence-based research, and NGOs or community groups can offer on-the-ground feedback regarding the impact of policies on people, including marginalized groups.¹

Incorporating the voices of women, young people, Indigenous Peoples, people with disabilities and other marginalized groups into the multistakeholder engagement process, helps ensure that the resulting policies are comprehensive, practical and responsive to the needs of society.² This approach reflects the principle of the “wisdom of the crowds” (see Box 16), where diverse perspectives contribute to strengthening collective problem-solving.³ Figure 10 summarizes the key contributions that each stakeholder groups can contribute to the agrifood systems policymaking processes.

Box 16 The concept of wisdom of the crowds

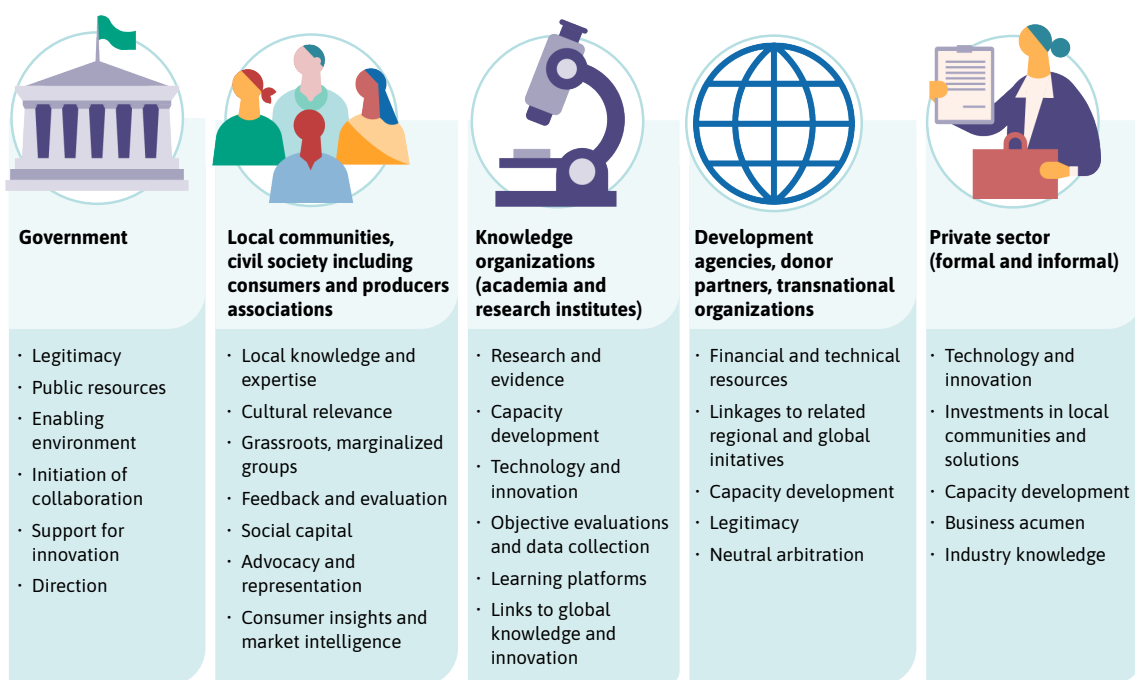
The wisdom of the crowds principle is a concept that suggests that large groups of people can make better decisions collectively rather than individually, often due to diverse inputs and experiences. An iconic example stems from a 1906 country fair, where attendees were asked to guess the weight of an ox. No single guess was exactly right, but when averaged, the crowd’s estimate was astonishingly close to the actual weight, showing that a diverse group’s aggregated judgement can be incredibly accurate.

Source: Surowiecki, J. 2005. *The wisdom of crowds*. Westminister, MD, Knopf Doubleday Publishing Group.

Broad participation and multistakeholder engagement also contribute to safeguarding the policy design process from power asymmetries. To ensure meaningful participation, it is important to pay attention to the preconditions for engagement. These include trust, access to evidence for informed decision-making, legitimate representation, capacity and knowledge to engage, and opportunities to influence decision-making.

Balanced participation depends on all parties having access to adequate resources, expert facilitation, and representation with the knowledge and capacities needed to contribute effectively.

Figure 10. Contributions to policymaking from different stakeholders



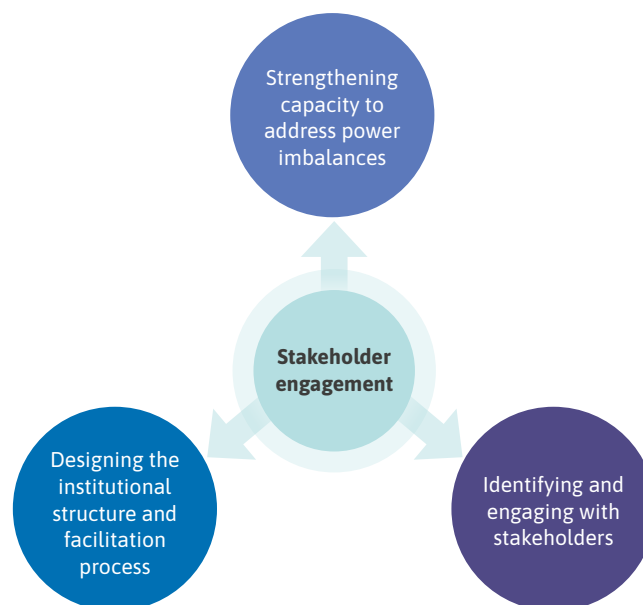
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Without these conditions, discussions may become dominated by well-resourced groups, particularly those with vested interests.^{4, 5} Meaningful stakeholder engagement extends beyond simply identifying and inviting participants. It also benefits from a clear engagement strategy that defines who should be involved, how they should participate and the purpose of their participation.⁶ (See Box 22 for a practical example of a stakeholder engagement plan formulated for the development of agrifood clusters in the Kyrgyz Republic.)

The remainder of this module provides guidance on three interrelated steps (see Figure 11) important for the development of a multistakeholder engagement strategy. These steps are not necessarily sequential and may overlap or evolve in parallel depending on the context:

1. Identifying and engaging stakeholders to ensure relevance and diversity.
2. Strengthening stakeholder capacities to address power asymmetries.
3. Designing institutional arrangements and facilitation processes to support collaboration.

Figure 11. Steps for the development of a multistakeholder engagement strategy



Source: Authors' own elaboration.

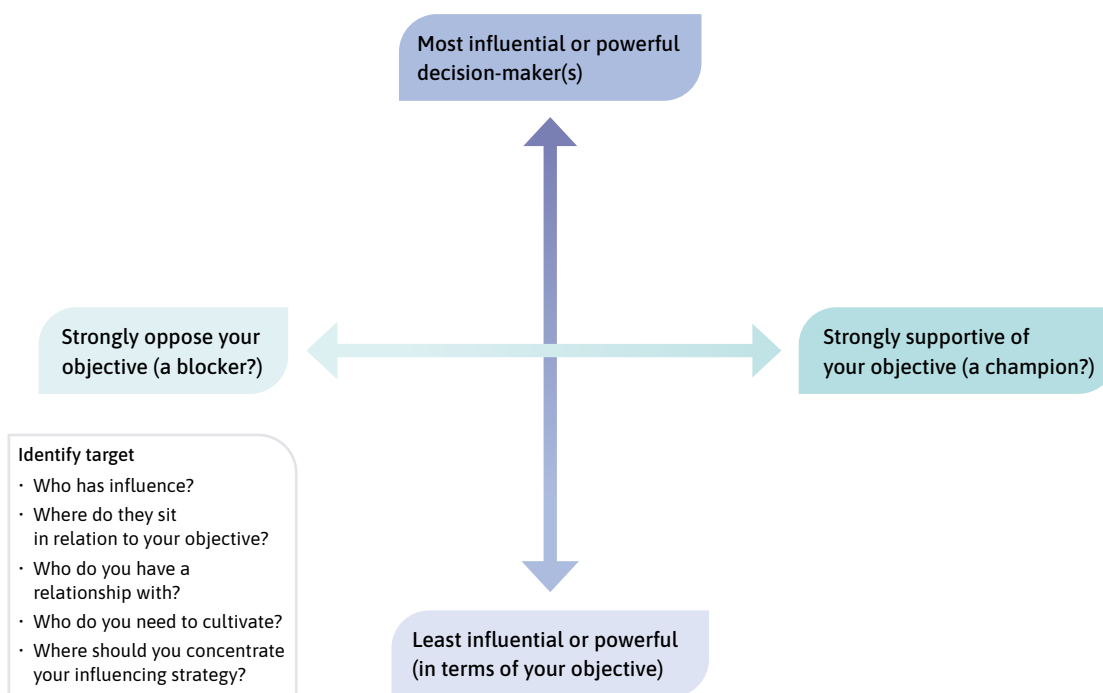
4.2 Identifying and engaging with stakeholders to ensure relevance and diversity

There are no clear-cut rules or definitive evidence for the number and diversity of stakeholders to include in a stakeholder consultation process.^{1,7} Stakeholder groups are not homogenous; differences exist not only across sectors of society but also within them. For example, farmer organizations may have varying priorities for policymakers depending on their agroecological zones, the commodities they produce and the market opportunities they can access. These characteristics can shape perspectives, alongside factors like race, gender and economic status, even within the same group.

Good practices that support an inclusive stakeholder identification process include the following:

Identifying relevant stakeholders. Stakeholder mapping and analysis can help identify those who are affected by or have a strong interest in the policy. Depending on the initiative's scope, a mix of tools may be needed.⁷ Figure 12 shares a framework that is commonly used to map stakeholders and inform stakeholder engagement strategies. (See Box 18 for insights into the multistakeholder engagement process employed for Chile's National Sovereignty Strategy for Food Security.)

Figure 12. Framework to map stakeholders and inform stakeholder engagement strategies



Source: Adapted from **Duncan, G.** 2019. *How to design an influencing strategy*. London, Oxfam. <https://oxfam.app.box.com/s/4dcxpxzufem7fw37zchfle75ll7ewh>

Engage stakeholders early in the policymaking process. Involving stakeholders from the outset allows time for internal consultation, preparation and resource planning, which supports more meaningful participation.

Ensure transparency in selection. Publicizing the stakeholder initiative in advance can help to build trust and legitimacy in the process. Details can include the criteria for stakeholder selection, who is involved in the decision-making process and the overall governance structure.⁸

Foster a flexible and adaptive stakeholder engagement approach. Treat stakeholder inclusion as an ongoing process. As issues evolve, new stakeholders may need to be brought in for consultation or to provide additional evidence.¹

Create incentives for participation. Once stakeholders see how their goals align with those of others, and the benefits become visible – through shared results or “small wins” – ownership and sustained engagement become more likely.^{6,9} Highlighting early successes and sharing stories of positive impacts can encourage broader participation over time.

Build visual maps to support shared understanding. Mapping stakeholder interdependencies can help develop a shared sense of direction⁹ and recognition that all parties have a right to be included. The systems analysis tools shared in Module 2 can facilitate collaborative visual mapping exercises.

Reframe problems from different perspectives. Helping stakeholders see situations from different sides can open up new possibilities for collaboration. Box 17 provides an expanded definition of reframing.

Box 17 Reframing

Framing refers to the way in which people or groups understand a problem, policy or idea, and how it is shaped by their own experiences, values, mindsets and knowledge. The way an issue is framed can have an impact on follow-up actions, such as how data are gathered, how solutions are developed, and how resources and responsibilities are allocated. People may naturally shift their perspective as they learn from experience. However, a mediator or facilitator may need to **reframe** the issue in a way that resonates with people's interests and needs. This can help align different viewpoints and move the collaboration forward.

Source: **University of Kansas**. 2024. Reframing the issue. In: *Community Tool Box*. Lawrence, KS. <https://ctb.ku.edu/en/table-of-contents/advocacy/encouragement-education/reframe-the-debate/main>

Box 18 Chile's multistakeholder engagement in the National Sovereignty Strategy for Food Security

Chile's National Sovereignty Strategy for Food Security was developed as an interministerial and intersectoral policy framework. The drafting of the strategy brought together 55 public agencies, including regional and local governments, 84 private institutions, 24 academic institutions, 3 international organizations and 43 individuals. This inclusive process reflects a commitment to incorporating diverse voices and perspectives into decision-making, fostering greater ownership and legitimacy in the policy process.

Officially released in 2023, the strategy's implementation includes 84 concrete, intersectoral actions, and 25 high-priority interventions targeted for immediate execution within the current administration.*

Chile's strategy embraces the concept of food sovereignty, which carries political weight, particularly in Latin America, where Indigenous Peoples and farmers advocate for greater control over their agrifood systems. However, in Chile, a net food exporter with a significant agricultural sector contributing to national GDP, the term "food sovereignty" is associated with trade restrictions and might be perceived as a threat to existing economic interests. To navigate this potential tension, the plan frames food sovereignty as a tool for achieving food security and nutrition, incorporating economic, environmental and cultural aspects of sustainability.

Note: *The strategy was being implemented at the time of research.

Sources: **Rapaport, I.** 2023. Chilean undersecretary of Agriculture on the National Sovereignty Strategy for Food Security: "The strategy proposes a definition of food sovereignty that aims to strengthen agriculture, local trade, and agroexports". In: *Marca Chile*. [Cited 14 October 2025]. www.marcachile.cl/en/chilean-undersecretary-of-agriculture-on-the-national-sovereignty-strategy-for-food-security-the-strategy-proposes-a-definition-of-food-sovereignty-that-aims-to-strengthen-agriculture-local; **Néron, M.L. & Mateluna, P.V.** 2022. Public policies and the food system in Chile. In: J-F. Le Coq, C. Grisa & P. Nierdele, eds. *Public policies and food systems in Latin America*. Versailles, Editions Quae. www.ncbi.nlm.nih.gov/books/NBK592182

4.3 Strengthening stakeholder capacity to address power asymmetries

Unequal access to resources and support can create power imbalances in policy consultation and design processes. As a result, the perspectives of some groups may be overlooked, leading to policies and programmes that fail to fully reflect local needs, knowledge and implementation realities. Addressing these obstacles will ensure that the needs of marginalized and vulnerable communities are addressed, particularly those of women and youth, Indigenous Peoples and persons with disabilities.

Providing targeted capacity support can help underrepresented groups participate more effectively in policy processes that affect their livelihoods.^{10, 11} Addressing gaps in stakeholders' capacities and resources can reduce barriers to meaningful participation, while also signalling government commitment to inclusive and transparent policymaking. An example of this is showcased in Box 22, where capacity-building efforts enable different stakeholders to participate more effectively in policy processes in the Kyrgyz Republic.

Additional long-term strategies that can empower the participation of marginalized groups in policymaking processes include the following:

- **Creating an enabling environment.** Officially recognizing the status of vulnerable groups as formal stakeholder actors in policymaking processes, can facilitate access to dedicated capacity building and services, including financial and technical support. Box 19 illustrates how countries in Latin America and the Caribbean have created an enabling environment for family farmers by officially recognizing their status in policy and legislation.

Box 19

Strengthening the enabling environment for farmer organizations through public procurement programmes

Across Latin America and the Caribbean, public procurement initiatives, such as institutional food procurement for school feeding (IFPSF) programmes, are helping family farmers access local markets by connecting them with schools. By building their organizational and marketing skills, these programmes strengthen farmers' collective bargaining power and enable better coordination with governments and civil society groups. As a result, family farmers are better positioned to influence decisions that affect their livelihoods.

The first step in strengthening farmer capacity is to establish a supportive legal framework. Recognizing family farmers or other vulnerable producers as key "policy actors" helps them gain access to resources and support systems. For example, family farmers and family rural entrepreneurs in Brazil are defined in federal law (Law no. 11.326/2006), which provides clear eligibility criteria for prioritizing these groups as suppliers in public food procurement. Furthermore, the School Food and Nutrition Law (No. 11.947/2009) mandates procuring entities to allocate at least 30 percent of the federal budget designated for school feeding programmes to purchases from family farmers, ensuring their direct participation in the supply chain.

IFPSF programmes offer a range of capacity-building services through public extension support, such as training in management and marketing. The programmes not only open up economic opportunities for family farmers, they also enhance their capacity and their influence in decision-making.

Sources: **FAO, Alliance of Bioversity International and CIAT and Editora da UFRGS.** 2021. *Public food procurement for sustainable food systems and healthy diets – Volume 1*. Rome. <https://doi.org/10.4060/cb7960en>; **Swenson, L.F.J. & Tartanac, F.** 2020. Public food procurement for sustainable diets and food systems: The role of the regulatory framework. *Global Food Security*, 25, 100366. <https://doi.org/10.1016/j.gfs.2020.100366>

- **Stimulating collective action.** Ensuring that marginalized groups have the capacities and resources necessary for adequate representation, helps to redress power imbalances.⁶ Capacity development and policy incentives may be needed to stimulate collective action (e.g. the formation and institutional strengthening of farmer associations).
- **Creating safe spaces for dialogue.** Bringing marginalized groups together in informal settings (e.g. support groups, community forums, youth clubs, cultural gatherings) supports experience sharing, recognizing common challenges and building confidence to advocate for needs.¹¹

4.4 Designing multistakeholder institutional structures for better policy engagement

The structure of a multistakeholder engagement process contributes significantly to shaping an inclusive and results-oriented initiative. Clearly defining and communicating the roles, rules of engagement and processes involved in a multistakeholder initiative, will contribute to greater ownership and ensure that all participants feel equally relevant. Facilitation and secretarial support are also essential for managing diverse interests, keeping the process on track and helping participants navigate complex or sensitive issues. Facilitators also play a key role, particularly in framing discussions in ways that resonate across different agendas.

The following good practices can contribute to the institutional strengthening of multistakeholder processes, and help ensure that diverse perspectives are able to inform policy outcomes.

1. **Steering committees provide strategic oversight and legitimacy, particularly when selection processes are transparent and inclusive.** Good practices to consider include:
 - Drawing leaders and representatives from across stakeholder groups to promote broad buy-in from appropriate decision-making levels, while also ensuring the legitimacy of leaders to represent respective groups.
 - Selecting steering committee members transparently and in consultation with stakeholder groups, to help reduce bias and strengthen the legitimacy of committee members.
 - Introducing quotas, such as gender balance or the inclusion of underrepresented groups, to promote greater inclusivity.¹²
2. **Technical Working Groups or subcommittees** encourage focused and multidisciplinary discussions as well as providing smaller structures for all voices to be heard. Good practices to consider include:
 - **Organizing members** into small, multidisciplinary groups for more tailored and innovative problem-solving.
 - **Generating leadership opportunities** for additional stakeholder groups to foster ownership within decision-making processes.

- **Providing smaller group settings**, especially for individuals who may feel less comfortable speaking in large discussion forums. This can help surface insights from women, youth or other marginalized groups, who are often underrepresented in public dialogues.¹²

3. **Facilitators** are central to creating inclusive environments and ensuring that the rules of engagement reflect shared values and objectives. Good practices to consider include:

- **Drawing on a diverse mix** of interpersonal skills, cultural and gender sensitivity, subject expertise, conflict management, and knowledge of agrifood systems and participatory methods. No single individual is likely to have all these skills, so teams of facilitators may be needed.^{1,13}
- **Ensuring logistical and administrative skills** are in place, especially where no dedicated secretariat exists. Facilitators may need to manage meeting arrangements or communication styles for different types of participants.¹²
- **Choosing facilitators according to the needs of the collaboration.** Facilitators from government, civil society or other organizations each bring different advantages and disadvantages (see Box 20).
- **Involving a neutral third party.** In situations such as high-conflict settings, or when trust or motivation is low, a respected local leader or expert neutral convener may strengthen engagement.⁶
- **Selecting facilitators transparently.** The legitimacy of facilitators will be strengthened if they are selected transparently, employing a process similar to that used for choosing members of the Steering Committee from among stakeholders.

Box 20

Strengths and limitations of different types of organizations acting as facilitators

- Local and national non-profits may have relevant expertise and be seen as neutral players, but they may struggle with limited financial resources.
- Government institutions can provide insights into policy processes but there may be apprehension among stakeholders about political agendas or bureaucracy.
- International organizations bring expertise and funding but may be viewed as promoting external solutions that are not tailored to national and local contexts.

Source: Neeff, T., von Lupke, H. & Hovani, L. 2018. *Cross-sector collaboration to tackle tropical deforestation. Diagnosing backbone support in jurisdictional programs*. Arlington, USA, The Nature Conservancy.

4. Secretariat functions support coordination, documentation and logistical continuity. Good practices that the secretariat can support include:

- **Appraising the prerequisites of stakeholders to engage**, which may vary across groups. For instance, consideration should be given to aspects such as the timing and location of meetings, the formality and format of discussions (e.g. presentations, breakout sessions, facilitated group work), and ways in which participants can help shape the agendas of meetings, whether organized online, in-person or through other channels.¹²
- **Adapting communication styles and channels to participants' needs**, including language, clarity, format and technology used (e.g. radio, WhatsApp). This helps ensure inclusive engagement, particularly for rural, remote or marginalized groups with limited connectivity or technical familiarity.¹²
- **Establishing clear rules of engagement** helps foster a sense of fairness and build an environment where participants feel confident and valued in the process.⁹ (Box 21 provides guiding questions that can support the development of ground rules.) Encouraging stakeholders to co-create or debate the rules of engagement during inception can strengthen shared responsibility and commitment to the process.
- **Having well-defined objectives for the collaboration**, especially goals that are specific, measurable, acceptable, realistic and time-bound (SMART), can help the secretariat clarify expectations and provide a common reference point for tracking progress and accountability throughout the process.

Box 21

Questions to support the development of ground rules

What is the role of representatives?

- Do they represent the views of a constituency?
- Do they have authority to take binding action on behalf of their constituency?
- Can alternates serve in a representative's place?

Is there a deadline for the negotiations?

- What is the timetable for the meetings?
- What happens if a timely agreement is not reached?

How will confidential information be handled?

How will media publicity be handled?

- Who will speak to members of the press on behalf of the partnership?
- When and in what form will information be released?
- What information will be kept confidential?

Will parties receive compensation and/or reimbursement for expenses for their participation?

How will a record of the proceedings be kept?

- What will be recorded? And by whom?
- Who will have access to the record?

How will consensus be determined?

- Must all parties reach agreement on all issues before decisions are presented to sponsors or others?

How will partners treat each other during deliberations?

Source: Gray, B. & Purdy, J. 2018. Designing multistakeholder partnerships. In: *Collaborating for our future: Multistakeholder partnerships for solving complex problems*. Vol. 1. Oxford, Oxford University Press. <https://doi.org/10.1093/OSO/9780198782841.003.0005>

Box 22

Stakeholder engagement plan for the development of agrifood in the Kyrgyz Republic

The World Bank's Resilient Agri-Food Clusters Development Project (RACDP) in the Kyrgyz Republic is designed to support the shift from short-term food self-sufficiency to long-term food security. The overall aim is to build sustainable agrifood systems. The project includes a number of components: developing agrifood clusters such as dairy and horticulture, strengthening institutions and systems through training and consulting services to farmers and processors, and providing operational and project management support to related national organizations. The project uses a stakeholder engagement plan to understand and involve stakeholders in agenda setting and project implementation.

Knowing the stakeholders

The project conducted a comprehensive stakeholder analysis to identify all relevant parties either directly or indirectly affected, positively or negatively, by the RACDP, as well as those who have an interest in the project. This included mapping farmers' associations, local businesses, government departments, research institutions and consumer groups to understand their interests, influence and relationships within the agrifood ecosystem.

Empowering stakeholders

The project includes a capacity-building component, providing training to beneficiaries in organizational and business development, productivity, market readiness, and climate resilient, nutrition-smart and green technology adoption, among others.

The project focuses on mobilizing collective action, for example by strengthening existing producer groups and facilitating their integration into selected value chains. By addressing organizational development deficiencies and linking targeted technical training and technology promotion, the project helps groups become more effective value chain actors and credible partners for upstream and downstream stakeholders.

The project emphasizes the inclusion of vulnerable groups throughout its activities, ensuring they have equal opportunities to benefit from implementation. This involves the organization of training activities in local communities to ensure broader participation by the target group. Training also prioritizes youth as a key vulnerable demographic benefiting from the project.

Making use of facilitators

The project recognizes the importance of identifying and collaborating with legitimate representatives of stakeholder groups. Such representatives, including village elders or elected officials, act as key channels for

disseminating information about the project, communicating between the project and the target communities, and providing valuable insights into local conditions. They participate in joint needs assessments, planning, prioritization of investments and joint monitoring of implementation. Critically, the project undertakes to verify the legitimacy of community representatives, to ensure they are true advocates for the community they represent.

Creating incentives for participation

The project directly supports the government's vision for a modern and sustainable agrifood system by 2030, resulting from national multistakeholder dialogues held within the aegis of the 2021 UN Food Systems Summit. This creates a sense of shared ownership over the direction of the project, encouraging deeper engagement and collaboration.

The project involves stakeholders in joint needs assessments, planning and prioritization of investments. This gives them a voice in shaping project activities and ensures that their needs and concerns are addressed, motivating them to participate in the design and implementation process.

Institutional design

The RACDP uses innovative social responsibility mechanisms like community scorecards and social audits to ensure transparency, inclusivity and accountability. For example, the project incorporates a Feedback Mechanism and a Grievance Mechanism to enable beneficiaries and other project stakeholders to provide feedback on the project. The Grievance Mechanism ensures that any stakeholder can file a complaint if they believe their rights or project principles have been violated. The mechanism covers all project areas and offers various channels for providing feedback, including hotlines, messaging apps, social networks and written requests.

The project also outlines a plan to ensure that direct and indirect project stakeholders receive relevant, timely and accessible information to enable them to express their views and concerns about the project and its impacts. This includes disclosure of information, consultations and other citizen engagement activities, which helps ensure transparency.

The RACDP ensures that presentations and dialogues are conducted in Kyrgyz, Russian and other languages, as needed, to enhance accessibility for all members of local communities. This helps ensure that language barriers do not prevent vulnerable groups from participating and benefiting from the project. Information is disseminated more widely through local traditional media (e.g. radio, telephone and SMS) and the involvement of NGOs, to ensure it reaches all relevant stakeholders and vulnerable groups.

Source: **World Bank**. 2024. *Stakeholder Engagement Plan (SEP)*. Resilient Agri-food Clusters Development Project. (RACD). Bishkek. <https://documents1.worldbank.org/curated/en/099091724053026673/pdf/P178120-75469bcb-6b3e-4702-8aca-3203cebadf98.pdf>

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Policy innovations for systems change – tools and practices



Suggested duration: 2.5 hours

Presentation: 1 hour

Learning Lab: 1 hour

Wrap-up and Q&A: 30 minutes

Module abstract

This module introduces participants to the role of policy innovation and structured experimentation in policymaking. It explores tools such as proofs of concept, prototypes, pilots and policy labs, which create “safe-to-fail” spaces where policy innovations can be tested before wider adoption and scaling. The module shows how these tools support evidence generation, stakeholder engagement and iterative learning for innovation, while underscoring their limits when testing remains disconnected from institutional systems. It also presents good practices on how to embed experimentation within agrifood systems policies and frameworks, demonstrating how to advance successful innovations beyond isolated tests, so that they become scalable solutions for agrifood systems transformation. This module builds on FAO's *Transforming Food and Agriculture through a Systems Approach*.¹ It aims to strengthen public sector capacities to apply *Systems Doing* in policymaking for agrifood systems transformation.

Learning objectives

- Equip practitioners with structured tools for designing, testing and refining policy innovations.
- Explore principles that ensure the testing of policy innovations foster transformation across agrifood systems.
- Learn about good practices for scaling successful pilots into agrifood systems policies and programmes.

Learning Lab

Defining the task

Participants develop a plan for an existing policy innovation within the agrifood context using the good practices outlined in [Section 5.3](#).

Activities

- In groups, participants select a policy innovation with which they are familiar, either technological, institutional or social.
- Groups develop roadmaps for upscaling the innovation, including two to three activities related to each good practice.
- Each group presents their findings to the main discussion group.

5.1 Key concepts – fostering a culture of innovation

Implementing even the most well-designed agrifood systems policies remains a challenge for governments, especially in situations where multiple objectives, uncertain outcomes and rapidly evolving conditions must be managed. Problems are often difficult to define clearly, and testing, adapting and scaling solutions through policies and programmes is rarely straightforward. Embedding a culture of innovation and experimentation within public sector policymaking processes can contribute to addressing these issues.^{1,2}

Innovation has become widely recognized as vital to addressing complex problems in agrifood systems – from technological advances, such as improved seeds and digital tools, to institutional, and social innovations, including cross-sectoral governance mechanisms, and public–private partnerships. Increasingly, attention is shifting from technological innovations alone towards policy innovations which bring together technological, institutional and social innovations to address interconnected challenges through systems approaches.^{3,4}

Policy innovation builds on two concepts – innovation and public policy – that are interpreted differently across disciplines, sectors, institutional and country contexts. Establishing a common understanding of these concepts provides a useful foundation for exploring how policy innovation can strengthen agrifood systems policymaking.

Innovation can be defined as *"doing something new and different whether solving an old problem in a new way, addressing a new problem with a proven solutions, or bringing a new solution to a new problem"*.⁶ Public policy is described as *"a course of action chosen by public authorities to solve a problem, address an issue"* and *"is expressed in the body of laws, regulations [and] policy frameworks implemented through programmes and projects"*.⁷

Policy innovation is increasingly recognized as a key driver of agrifood systems transformation. It supports either (or a combination of) technological, institutional and social innovations⁷ through public policies to address complex agrifood systems challenges.^{8,9}

A defining feature of policy innovation is experimentation. Before innovations can be mainstreamed through policies and programmes, they require testing outside of standard policy cycles. "Safe-to-fail" environments enable public institutions and non-state actors to test new technologies and ideas, using fewer resources within shorter time spans, before committing to broader implementation.¹⁰⁻¹³

Governments, in collaboration with academia, the private sector and civil society have been testing innovations in agrifood in various forms for over a century,¹⁴ including with specialized UN agencies such as FAO. Over time, the methods used to conduct these tests, and the ways in which results are incorporated into policy, have evolved.

To ensure innovations are viable before they are integrated into policy and scaled, governments rely on tools, such as proofs of concept, prototyping and piloting, for testing or trialling. These terms are often used interchangeably. **Proofs of concept** and **prototyping** often form part of exploratory stages in innovation design.¹⁵ **Pilots** are more intentional, demonstrating the likely impacts of innovative technologies on a target group, object or location.¹⁶

More recently, the concepts of “policy labs” or “public sector innovation labs” have become popular, with a number of interrelated terms¹⁵ also used interchangeably. Similar to pilots and prototyping, **policy labs** also support the testing of innovations by providing resources to create and test new programmes and projects, but with more emphasis on stakeholder engagement.¹⁷ Policy labs are not considered as alternatives to more traditional tools for testing innovations, but instead as additions to the testing toolkit.⁹

As such, policy labs, proofs of concept and prototypes contribute to the refinement and scaling of successful policy innovations in controlled environments, with possibilities to gather real-time feedback and adapt solutions in response to findings.^{18,19} Experimenting with policy innovations in controlled settings can bridge the gap between policy intention and real-world outcomes, increasing the likelihood of meaningful, scalable transformation.^{1,4,20,23} Creating mechanisms to disseminate the knowledge generated in “safe spaces” across relevant policies and programmes, will ensure that policy labs do not become “islands of knowledge”.²¹

The next two sections describe these tools and their applications, outlining uses and limitation as well as good practices for policy design, governance arrangements and financing mechanisms.²²

5.2 Towards scaling – tools for trialling and testing policy innovations

Despite growing recognition of the importance of policy innovation for agrifood system transformation, policymakers are often uncertain which approach to adopt for testing, validating and scaling new approaches. Depending on the scope of the policy innovation, as well as the resources and timeframe available, the type of tool selected may be tested independently or in sequence. For instance, an innovation may develop from a proof of concept, following an evaluation of feasibility, to a prototype for refinement. The next stage is real-world piloting, which if deemed successful, and resources permitting, can lead to scaling of the innovation through public policies and programmes.

The rest of this section provides descriptions of proofs of concepts, prototyping, piloting and policy labs, including how they complement one another, with illustrations of their application. While the descriptions indicate distinct uses for each tool, the terms “proof of concept”, “prototype”, “pilot” and “policy lab” are also often used interchangeably in the literature and the public sector.

5.2.1 Proofs of concept

Proofs of concept usually focus on a specific, narrow innovative concept or technology, assessing its feasibility through testing or simulation. In the context of policy innovation, a proof-of-concept can demonstrate if a policy, or part of a policy, is potentially viable technically, legally, institutionally or operationally. Proof of concepts may involve setting the scope and criteria for success, gathering necessary data, brainstorming with a multidisciplinary team on concept design, refining the concept based on feedback, and lastly finalizing and testing the concept.²⁴ Box 23 provides an example from Ireland of a cluster of pilot projects functioning as proof-of-concept for agrifood policy transformation.

Box 23

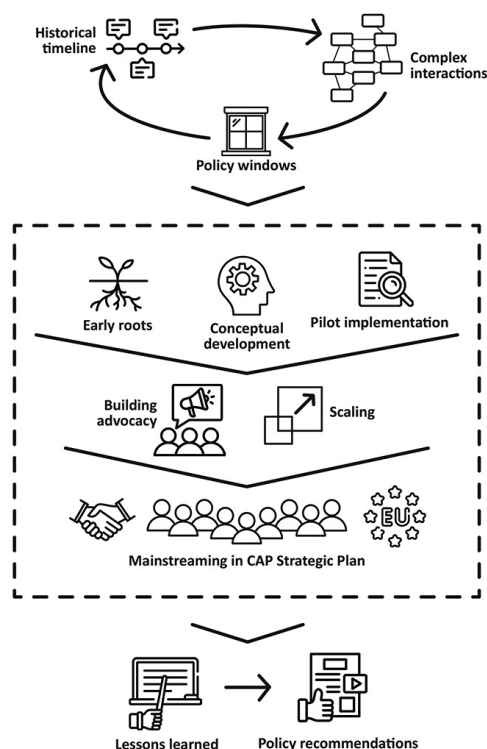
Developing proof of concepts for scaling Ireland's Results-Based Payment Schemes

Ireland's Results-Based Payment Schemes (RBPS) were developed as an alternative to traditional prescription-based agri-environment schemes, which had been criticized for poor environmental returns on investment.

Over a period of approximately 20 years, pilot projects tested whether paying farmers based on measurable environmental outcomes – rather than compliance with fixed actions – could improve biodiversity and environmental performance while remaining practical for farmers and administrators. Pilots played a central role in “providing proof of concept”, building implementation capacity and refining methodologies before wider scaling through government policy programmes.

The proof of concept showed that scaling was not driven by evidence alone; rather, the transition from pilots to national policy depended also on sustained advocacy, coalition building and the strategic use of policy windows linked to reforms of the European Union's Common Agricultural Policy (CAP). The proof-of-concept phase therefore contributed not only to testing technical feasibility, but also to strengthening institutional learning, farmer engagement and policy readiness. The approach was eventually mainstreamed within Ireland's CAP Strategic Plan (2023–2027), representing one of the largest examples of the implementation of results-based agri-environment policy in Europe.

Understanding evolution of RBPS in Ireland



Source: Douthwaite, B., Goggins, G., Bleasdale, A., Boyle, P., Carberry, C., Crushell, P., Delaney, B. et al. 2026. Pilots, proponents and policy windows: How Results-Based Payment Schemes (RBPS) became mainstream in Irish agri-environmental policy. *Agricultural Systems*, 233: 104621. <https://doi.org/10.1016/j.agsy.2025.104621>

5.2.2 Prototyping

Prototyping can build off the lessons learned during the proof of concept stage. Some policy ideas may already be sufficiently advanced, based on testing carried out in other countries or localities, to proceed straight to the pilot phase. In other cases, a prototype offers a hands-on, agile way to experiment with new policy ideas before piloting and subsequent scaling. Prototyping also allows for applied learning, early testing and continuous refinement before piloting. Prototypes can therefore be considered as early-stage experimental versions of tested proofs of concepts. They are typically carried out in controlled environments, and may include mock-ups, simulations or role-playing exercises to assess functionality and user experience. This approach allows for quick feedback and iterative changes before formal implementation of a larger pilot is carried out. If the results exceed expectations, the prototype may be scaled without piloting. Box 24 provides a detailed description of the prototyping approach used by Vinnova, Sweden's national agrifood systems strategy, aimed at using school meals as a lever to transform agrifood systems. Nesta, the independent agency for innovation of the United Kingdom of Great Britain and Northern Ireland, also offers a guide for prototyping.²⁵

Box 24

Sweden's School Food Mission: Using school meals to drive systemic change

Sweden's School Food Mission, managed by the innovation agency Vinnova, is leveraging school meals to create systems change. With the goal of ensuring every student enjoys sustainably produced and delicious school food, this initiative has connected with a publicly managed system that reaches nearly every child across the country.

Schools are more than just places of learning; they are key social spaces that influence everything from health and education to local economies and environmental sustainability. The premise of the initiative is that transforming school meals not only improves nutrition and academic outcomes, it also serves broader societal change.

The School Food Mission has developed a portfolio of prototypes through multistakeholder workshops. These prototypes focus on different aspects of the school agrifood system, all aiming to transform how food is sourced, prepared and consumed in schools. The eight main components are:

- **Farm:** Connects local farmers with schools, integrating food-growing activities on school grounds and fostering direct relationships between students and producers.
- **Database:** Tracks the climate and health impacts of food choices, helping schools make informed, sustainable decisions.
- **Pantry:** Stocked with ingredients selected based on health, sustainability and taste criteria, using insights from the Database to guide choices.
- **Cookbook:** Offers recipes and cooking guidelines that integrate food education into the school curriculum, promoting healthy, sustainable meal preparation.
- **Kitchen:** Prototypes new kitchen spaces and equipment that make cooking more educational and enjoyable.

- **Meal:** Explores different meal formats and settings to enhance student engagement and social interaction during mealtimes.
- **Forum:** Involves students, parents, cooks, teachers and local authorities in food policy discussions, giving them a voice in school food practices.
- **Contract:** Introduces new procurement models aligned with health and sustainability goals, working alongside the Forum to oversee the pantry and kitchen.

To bring these concepts to life, Vinnova and the Swedish Food Agency launched the Skolmat Prototype Call in 2019. Four municipalities – Karlstad, Vällentuna, Hofors and Munkedal – were chosen to implement and test these prototypes. The focus was on small to medium-sized municipalities facing typical challenges, rather than larger cities with advanced agrifood strategies. This enabled Sweden's School Food Mission to better understand what works in a range of local settings.

- In **Karlstad**, the aim was to transform the high school dining experience, making it a welcoming and exciting space where students feel valued. Based on concerns that many students skip lunch for less healthy options, the Karlstad team aimed to make the school dining area more appealing. Innovations included a “try-out” island where students could sample sustainable foods and a social area with bar tables for interactive cooking demos, creating an environment that links food, learning and well-being.
- In **Vällentuna**, the prototype sought to expand students’ taste preferences and awareness of sustainable, healthy foods. Through hands-on activities, students explored new foods and learnt about their origins. School cooks prepared and presented sustainable dishes, while teachers and local producers provided additional insights. This prototype, which was tested with fifth and sixth graders, centred around tofu – a locally produced ingredient – allowing students to explore its preparation and taste in various ways.
- In **Hofors**, the objective was to connect diet, health, sustainability and community engagement. This prototype included partnerships with a local greenhouse and science centre, and revived the idea of a “picnic” environment, where students could enjoy meals with their teachers outdoors. The meals featured local, organic and plant-based ingredients. Hofors also piloted two tools: an Evaluation App, where students could select meals and give feedback, and a Food Box, which allowed students to take home leftover meals, minimizing food waste and supporting food access for low-income families.
- In **Munkedal**, the prototype introduced a “food market” concept at school, where students became “meal Influencers”. This market linked the school agrifood system with subjects like home economics and biology. Students participated in meal planning, ingredient selection and preparation, gaining hands-on experience with sustainable foods and increasing their awareness of their cultural and health significance. Each market event focused on a theme, such as local production or plant-based foods, helping students understand the impact of their food choices.

These prototypes tested and refined ideas before implementing them on a larger scale. The subsequent planned phase involves scaling up successful prototypes to create cohesive, city- or region-wide school agrifood systems. For example, transforming one school’s meal programme could pave the way for a municipal model that integrates food procurement, logistics and education across multiple schools. By starting with school meals, Sweden’s School Food Mission created a ripple effect, showing how food can drive systemic change in health, sustainability and education.

Source: Hill, D. 2022. *Designing missions: Mission-oriented innovation in Sweden – a practice guide* by Vinnova. Stockholm, Vinnova.

5.2.3 Piloting

Pilots are implemented on a small scale in a real-world setting to evaluate feasibility, effectiveness and potential challenges. Potentially building off the refinement of a prototype or a related pilot project, pilots test ideas in practice, serving as a final test before upscaling. Box 25 describes the piloting of a digital platform for small farmers in India.

Box 25 Examples of piloting innovations in agricultural extension

Based on growth in demand on the part of governments to help small farmers adapt to digitalization, FAO Bangladesh is providing technical assistance to the public sector, national research institutions and farmer organizations, to pilot virtual call centres that provide advisory services to farmers. The services cover areas such as e-commerce and cashless payment solutions, leveraging available technologies such as mobile phones, web-based messaging services, social media, digital money (bKash, Rocket and Nagad, etc.) and online meeting platforms.

According to the project findings, the pilot has linked 10 000 farmers, of whom 46 percent are women, with input suppliers and off-takers. Participating farmers have sold products worth nearly USD 500 000 to buyers, and purchased essential agriculture inputs worth over USD 70 000 from suppliers during the reporting period. The pilot engaged with local extension networks and farmer organizations, operating within a broader enabling policy environment promoted by national and state agricultural authorities.

Supported by the Global Agriculture and Food Security Programme, the pilot contributed directly to the adaptation of the Agricultural and Rural Credit Policy and Programme, FY 2022/23, including farmers' organizations as agriculture group loan disbursement agents. The initiative also introduced preliminary evidence to advocate for farmer organizations as managers of revolving loan funds.

Sources: **FAO**. 2023. *Increasing access to finance for farmers' organizations in Bangladesh: Project findings and recommendations*. Rome. www.gafspfund.org/sites/default/files/inline-files/GCP%20BGD%20064%20GAF%20Terminal%20Report%2022-09-2023.pdf; **Jiva**. 2021. Olam rebrands Farmer Services Platform as Jiva; Jiva enters the Indian market. Medium, 25 January 2025. <https://medium.com/@jiva.ag/olam-rebrands-farmer-services-platform-as-jiva-jiva-enters-the-indian-market-7c29a23fda9e>



Participants engage in group work during an FAO training workshop.
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5.2.4 Policy labs

Policy labs provide a structured space for tackling complex agrifood challenges through collaborative problem-solving.²⁶ They help governments reframe issues, co-design solutions with diverse actors and explore new policy pathways before formal adoption.¹⁷ The aim of the *labification* terminology associated with this tool is to bring the discipline of scientific laboratories into the policy-testing arena, embedding systematic experimentation, testing and monitoring into the development and refinement of new policy innovations.¹⁴

While conventional pilot approaches are typically used to test new agrifood technologies or policy innovations, policy labs go further by also seeking to:

- improve the science policy interface for more robust evidence-based policies;²⁷
- understand policy problems and solutions through a multi-actor lens;²¹
- introduce multistakeholder opportunities to co-design and co-create new public products and services, with the ultimate goal of closing the “knowing-doing gap”.²⁷

Cities, in particular, have been shown to be spaces in which experimentation can flourish through tools labelled as test beds, city labs, urban living labs, innovation labs, co-labs and urban transition labs, in which the public sector has undertaken an active role.^{2, 28} Within this broader landscape of experimentation, policy labs function not as alternatives to traditional pilot approaches, but as an enhanced and complementary addition to the testing toolkit.⁹ Box 26 presents the Uganda Food Change Lab, an example of a policy lab launched to address interconnected problems related to processing, soil quality and child malnutrition.

Box 26 Policy labs in action in western Uganda

Fort Portal, a growing city in western Uganda’s Kabarole district, is an important food exporter but still struggles with limited processing facilities, soil depletion and child malnutrition from diets heavy in starches. To tackle these issues, the Uganda Food Change Lab was launched to test practical solutions on the ground.

Organized by the Kabarole Research and Resource Center (KRC) alongside international partners, the Lab brought together city officials, regional authorities, national policymakers and local residents to pinpoint the biggest gaps in both formal and informal agrifood systems. From there, they rolled out a series of small-scale pilots to understand what solutions work best in addressing these gaps.

One pilot focused on street food vendors who provide affordable and nutritious meals to many low-income families, but have often been forced off the streets under old rules. The Lab helped these vendors form an association so they could negotiate directly with the city. In response, Fort Portal’s government officially recognized the group, set aside a dedicated vending area, and even provided basic infrastructure and uniforms. With support from the Uganda Food Change Lab, they are also working with the national Parliamentary Forum on Nutrition to update Uganda’s laws, so that street food vending is both legal and safe – scaling up a simple idea that worked at the city level to a broader policy change.

Source: Boerwinkel, F., Mohammed, S. & Daisy, I. 2018. *Uganda Food Change Lab: Planning for the future food system of Kabarole district*. London, International Institute for Environment and Development and Hivos.

Table 8 summarizes the primary purpose of proof-of-concepts, prototyping, piloting and policy labs, including where in the innovation cycle they are typically applied, the type of testing environment, the scale of stakeholder engagement, the outputs that can be expected, and possible limitations and risks, alongside illustrative agrifood-related examples.

Table 8. Comparing tools for policy innovation* in agrifood systems

Tool	Primary purpose	Stage in innovation cycle	Scale and testing environment	Stakeholder engagement	Outputs	Limitations/risks	Example
Proofs of conceptⁱ	Test feasibility (technical, legal, operational)	Early inception exploration	Small, controlled; may involve simulation	Limited – mainly technical experts	Evidence that concept can work; recommendation to proceed or stop	Limited stakeholder involvement; technical success may mask institutional barriers	Proof of concept developed for scaling Ireland's Results-Based Payment Schemes under the EU's Common Agriculture Policy (see Box 23)
Prototypesⁱⁱ	Assess functionality and user experience	Concept design and refinement	Controlled or semi-controlled; interactive	Tested with limited frontline users for feedback	Minimum viable version of service/technology	May miss real-world delivery challenges	Sweden's School Food Mission, managed by the innovation agency Vinnova, leveraging school meals to create systems change (see Box 24)
Pilotsⁱⁱⁱ	Test performance under real-world conditions	Pre-scale validation	Small geographic or target group	Target group, delivery and partner institutions	Evidence on results, costs, delivery model; scale decision	Risk of "pilot islands"; not scalable at institutional/system level	Piloting virtual call centres in Bangladesh and policy changes in access to finance products for farmers' organizations (see Box 25)
Policy labs^{iv}	Temporary space for collaborative problem-solving using multiple perspectives. Labs support learning and cross-actor coordination	May operate at multiple stages: concept, prototyping and piloting	Multi-site experimentation (e.g. urban markets); short project cycles; may not integrate fully into formal government systems	Co-creation with government, civil society, private sector, academia and end-users	Small pilots; new governance mechanisms; redefined problem statements; improved actor alignment; insights for reforms	Resource intensive and difficult to sustain; no guarantee of scale or long-term change; findings may remain localized/not mainstreamed	Uganda Food Change Lab – convening actors to co-design food system solutions and support changes in street food policy and nutrition governance (see Box 26)

Note: *The terms used to describe the tools explained here are frequently used interchangeably.

Sources: See [Notes](#) at the end of the module.

5.3 Challenges and solutions for scaling policy innovations across agrifood systems

While tools like prototyping, piloting and policy labs are essential for testing policy innovations, their true potential for systems change lies in how they are applied. This requires a culture of experimentation within the policymaking cycle (see Module 2) rather than treating prototypes, pilots or policy labs as one-off technical exercises. Whether developing prototypes to assess the feasibility of an idea or piloting to generate evidence on how proposed policies interact with delivery contexts, successful testing ultimately depends on the scaling and institutionalization of the innovation in a way that facilitates broader systemic impact. This requires resources, suitable governance structures and long-term mechanisms to support scaling.

Even with these measures in place, turning successful pilots into large-scale programmes that benefit regions or entire countries remains challenging. Policy innovations that demonstrate effectiveness under controlled conditions can still falter when applied in real-world settings.^{29,30} This is partly because innovations are often tested at small scale, typically within controlled group settings or narrowly defined geographic contexts.

By narrowing the problem and technical analysis to similar socioeconomic groups or a specific geographic location, small-scale testing can avoid complexity across technical or sectoral boundaries.²⁹ It also helps manage the scope of the test and ensures that results remain grounded in local realities.

However, this same narrow testing environment presents several constraints,³⁰ which are described in Table 9. These are mainly linked to weak programmatic engagement beyond the immediate test site and team. This can limit eventual plans for replication³⁰ and can also undermine the likelihood that the innovation will impact the rest of the agrifood system. Table 9 also shares mitigation measures, which if embedded early into a policy innovation's development can help address some of challenges described.³¹

Adapted from the design principles on prototyping (see Box 26), the following practices and country examples show how the mitigation measures outlined in Table 9 can support the scaling of innovations in national and subnational settings. These practices emphasize alignment between pilot initiatives and government priorities, early engagement of the right partners and embedding scale-up strategies from proof-of-concept phases. Together, they can enable small innovations to evolve into sustainable programmes that deliver lasting benefits for agrifood systems transformation.

Table 9. Challenges and mitigation strategies for upscaling policy innovations

Challenges	Mitigation strategies
Reliance on external expertise and small implementation teams can lead to disconnections with formal policymaking processes and missed learning opportunities for policymakers.	Anchor the testing of innovations to government or local government priorities, and also within sub-national or national public institutions, an established NGO or a national agrifood company, to allow for a smoother transition to broader implementation.
Pilots that work in one area may require significant adjustment elsewhere, as differences in conditions such as production systems, capacities, local government environments and market structures can affect how policies are interpreted and scaled.	Develop coalitions that bring together government agencies, investors, research institutes, NGOs, farmer organizations and private sector partners with clearly defined roles.
As policy innovations move from pilot settings to national or regional application, contextual diversity increases considerably, across environments and socio cultural settings not represented in narrower test sites.	Identify potential barriers in advance, addressing concerns, and build the political and multistakeholder support and legitimacy needed for future expansion.
Even when testing is successful, scaling may still fail if the intervention relies on short-term resources that end once the pilot concludes.	Establish monitoring and evaluation systems that collect real-time data and use feedback to refine and strengthen the scale-up process. Document evidence of impact as the initiative expands, ensuring that learning continues and that robust data build confidence among leaders and funders that the innovation merits further investment and mainstreaming.

Sources: Sartas, M., Schut, M., Proietti, C., Thiele, G. & Leeuwis, C. 2020. Scaling readiness: Science and practice of an approach to enhance impact of research for development. *Agricultural Systems*, 183: 102874. <https://doi.org/10.1016/j.agsy.2020.102874>; FAO. 2019. *Scaling up agroecology to achieve the Sustainable Development Goals*. Rome. www.fao.org/family-farming/detail/en/c/1192634

5.3.1 Challenge-driven focus

Policy innovation efforts are explicitly connected to an existing government policy priority. Engagement with responsible agencies takes place early in the process.

Country example: In India, the Bharatiya Agro-Industries Development and Research Foundation, working in collaboration with the State Tribal Department, supported the design of the “Wadi” model in the 1980s. This combines water management with agri-horti-forestry model innovation to improve the quality and productivity of tribal land. The innovation was adapted and scaled through its incorporation into national policy, resulting in the restoration of degraded tribal land into productive farms. The process employed a combination of agroforestry, horticulture, watershed management, soil and water conservation, and participatory community engagement. From the outset, the pilot engaged with local and national government institutions, which encouraged the adoption of the approach by state tribal departments. The National Bank for Agriculture and Rural Development subsequently created a dedicated fund to replicate the land transformation model nationwide. A successful pilot combined with government ownership, investment and policy adaptation were all pivotal in achieving large-scale impact.^{32, 33}

5.3.2 Built-in scale-up strategies

Engagement with institutions and investors responsible for future scaling starts early, ensuring they have the resources, readiness and capacity to expand successful solutions.

Country example: The project Capacity Development for Agricultural Innovation Systems (CDAIS) (2015–2019) worked in multiple countries to strengthen “agricultural innovation systems”. Based on a framework designed to ensure better coherence and greater impact of capacity development for agriculture in tropical countries, the project developed the capacities of National Innovation Facilitators delivering extension services to farmers, agribusinesses and consumers. By focusing capacity development on functional “soft” capacities and technical capacities from the outset – creating participatory planning tools and institutionalizing coordination – CDAIS helped to translate data and findings from innovations into lessons for policymakers. This led to existing institutional arrangements being updated, which increased the chances of long-term uptake and scalability.³⁴

5.3.3 Multidisciplinary collaboration

Coordination mechanisms bring together diverse disciplines and institutions, integrating skills, mandates and resources needed for future scaling.

Country example: In Niger, over a ten-month period in 2017, the testing phase for an Interactive Voice Response (IVR) for farmers prototype brought together representatives of multiple disciplines including farmers, breeders, agrifood product buyers, veterinarians, software specialists, data analysts and public agricultural extension services. The E-KOKARI prototype is an IVR platform that enables farmers, breeders and buyers in Niger to access agricultural information, advice and market prices in their own local languages by dialling a short code on a mobile phone. The prototype’s development relied on high-level, cross-institutional collaboration between the Agricultural Chambers Network, a private tech company, FAO and the Ministry of Agriculture, specifically in relation to public advisory and information services.³⁵

5.3.4 Public-private partnerships

Strong public-private linkages, including with investors, are established early to support broad-based adoption and sustainable scaling of innovations.

Country example: In Indonesia, a public–private partnership (PPP) was established in 2010 between the Ministry of Agriculture, local governments, private agribusiness firms and smallholder cooperatives to strengthen the horticulture value chain. Support was provided under the New Vision Platform,³⁶ which brought together governments and multinational agribusiness companies to address three policy priorities: ensuring food security, spurring agricultural production in an environmentally sustainable manner and engendering inclusive economic growth. Under the partnership, private companies were responsible for investing in post-harvest technology, cold storage

and market linkages, while government agencies committed to improving extension, regulatory support and coordination. This PPP upgraded smallholders' ability to meet quality standards, access higher-value markets and sustain adoption beyond the pilot, because firms had commercial incentives to maintain long-term sourcing relationships.³⁷

5.3.5 Adaptive policy interface

Policymaking processes allow for learning, iteration and adaptation, with minimal bureaucratic procedures.

Country example: In Kenya, a public-private partnership revived the pyrethrum sector through deliberate changes to regulatory and licensing policy in 2013. The partnership agreement included an onus on the government to adapt regulatory³⁸ and licensing procedures to allow new private processors to enter the market. This shift replaced a rigid, state-controlled system with a more open, responsive regulatory framework. By easing licensing barriers and updating quality-control rules, policymakers enabled new business models to emerge, increased competition and accelerated farmer adoption, demonstrating a flexible, adaptive policy environment that evolved as the innovation scaled.^{39–41}

5.3.6 Localized experimentation

Small-scale, interconnected testing environments are used to explore solutions that can contribute to system-level impact.

Country example: In China, the Agriculture Extension Special Task Force (AESTF) began as a small pilot in Nanping city in 1998, to improve market-oriented agricultural extension for farmers. Following initial training on the approach, the pilot deployed trained extensionists to villages to set up demonstration plots with farmers, introducing them to improved technologies, new crops, market opportunities and a finance scheme. The gradual inclusion of villages over time, supported by ongoing engagement with local government, farming institutions and financial institutions, saw the pilot scale into a nationwide extension programme by 2010, covering approximately 1 800 counties and reaching over 60 percent of rural China.^{42, 43}

5.3.7 Systems tools

Tools such as visual spaghetti maps, canvases and frameworks (see Module 2 for more information on systems tools) are used during innovation testing to help stakeholders visualize complexity, align understanding and co-design solutions that can be scaled through national and subnational systems.

Country example: In Sweden, the Innovation Agency, Vinnova, uses systems canvases and mapping during cooperative workshops to bring the "system into the room". This enables stakeholders to visualize hidden dependencies and align on key "angles" – components of a system where

intervention could lead to change (e.g. technologies, business models, cultural activities). These identified leverage points are then tested through prototypes – active real-world interventions that aim to address hidden cultural responses, policy blockages and technical challenges through rapid, iterative learning.

Vinnova's design principles are summarized in Box 27.⁴⁴

Box 27

Vinnova's principles for designing prototyping missions

The point of prototyping missions is systemic change for societal outcomes. Vinnova's various initiatives are carefully framed to maintain an approach that honours different perspectives, producing multiple shared outcomes from interventions and building both infrastructural and cultural change alongside other enabling conditions.

The following principles help sculpt prototype design, unlocking systemic change through impacts on data, scale, regulation, capability, culture and engagement. These principles offer a key to building a scalable prototype:

1. **Outcomes.** Indicate how the mission delivers against, or refines, core shared outcomes and agreed mission trajectories.
2. **Scale.** Initiate and nurture interaction or impact at next scales above and below (scale can be organizational and spatial).
3. **Lever.** Indicate what existing and widespread system elements can be incorporated as the vehicle for exploration and change.
4. **Data.** Create new strategic data for shared impacts and value, while building new capacity for managing such data.
5. **Conditions.** Uncover, articulate and initiate necessary changes in conditions like regulation, policy, financing and incentives.
6. **Capability.** Develop skillsets, perspectives or organizational cultures necessary for the mission in question, and other missions.
7. **Engagement.** Use citizen-facing formats to articulate intent, co-design action and outcomes, and stimulate discussion.
8. **Agility.** Describe an adaptive strategy for delivery, indicating how it is able to react to changing conditions.

Source: Hill, D. 2022. *Designing missions: mission-oriented innovation in Sweden – a practice guide* by Vinnova. Stockholm, Vinnova.

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From data to delivery – mobilizing and aligning finance and investment for agrifood systems transformation



Suggested duration: 2.5 hours

Presentation: 1 hour

Learning Lab : 1 hour

Wrap-up and Q&A: 30 minutes

Module abstract

This module explores the role that finance and investment play in agrifood systems transformation. It examines three interrelated challenges referred to collectively as the “triple gap”: a data gap, arising from insufficient information on financial flows and investments; a finance gap, estimated at USD 680 billion annually; and a planning gap, caused by insufficient alignment between finance and investment decisions and national policy objectives. Drawing on best practice examples and country experiences, the module explains how governments can strengthen systems approaches to finance and investment. It also emphasizes that delivering coherent outcomes across economic, social and environmental objectives, requires not only growth in finance and investment, but also improvements in how resources are designed, governed and aligned. The module builds on FAO’s *Transforming Food and Agriculture through a Systems Approach*.³ It aims to strengthen public sector capacities to apply *Systems Investment* in policymaking for agrifood systems transformation.

Learning objectives

- Understand different sources of finance and how they can be categorized.
- Explore the data, finance and planning gaps constraining the adoption of a systems approach.
- Examine ways to address the data, finance and planning gaps in order to improve the flow of finance and investment to agrifood systems.

Learning Lab

Defining the task

Participants develop a strategy for coordinating and catalysing finance and investment for a selected agrifood policy.

Activities

- Participants select an existing agrifood systems policy, and then divide into groups.
- Using the case in Box 30 as an inspiration and the good practices described in [Section 6.4](#), each group develops a strategy to improve alignment between policy objectives and finance and investment.
- Back in the main discussion group, groups present their findings and discuss ideas that could be integrated into their work.

6.1 Key concepts – the role of finance in driving sustainable agrifood systems transformation

Despite global commitments to food security, climate mitigation and nutrition, current investment patterns remain misaligned with agrifood systems objectives, often reinforcing unsustainable outcomes.¹ Agrifood systems transformation faces an estimated annual financing gap of USD 680 billion.² However, the challenge extends beyond the volume of finance and investment available. Fragmented institutional responsibilities, short-term planning and rigid financing arrangements limit the ability of governments and investors to align resources around shared outcomes spanning multiple sectors.³

Addressing this challenge requires a systems approach to financing and investment (see Box 28 for definitions). Specifically, it demands an approach in which financial flows are actively governed and aligned within and across public and private actors, driving policy coherence across food security, nutrition, socioeconomic processes and the environment.³

Box 28 Definitions of financing and investment

“Financing is the process of providing funds for the public and private sector to engage in economic activities, make purchases or carry out investments.”ⁱ

Investment is generally defined as activities that result in the accumulation of capital that yields a stream of returns over time.”ⁱⁱ

Sources: i. **FAO, IFAD, UNICEF, WFP & WHO**. 2024. *The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms*. Rome. <https://doi.org/10.4060/cd1254en>; ii. **FAO**. 2012. *The State of Food and Agriculture 2012 – Investing in agriculture for a better future*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/i3028e>

In practice, this implies recognizing the different, but complementary, functions that public and private finance perform within agrifood systems. Private finance is often the primary source of capital for commercial activities, while public finance helps create the enabling conditions for aligning investments, managing risks and steering resources towards shared priorities. Even when these flows converge, they are nonetheless driven by different incentives, time horizons and risks. To understand how they complement one another, it is useful to distinguish their respective roles.

Private finance ranges from household savings and farm and value chain informal reinvestments to commercial bank lending and foreign direct investment. It accounts for a significant share of the capital formation in agrifood systems, particularly in production, processing and trade.^{4,5} Across the public sector, coordination is also needed across ministries and levels of government to align policies, budgetary planning and expenditures, and investment priorities.^{3,6}

Public finance plays a distinct but complementary role through budgets, subsidies, taxation and public spending. It is critical for the provision of public goods, correcting market failures, and de-risking investments in innovations, technologies and infrastructure. These types of investment can generate long-term social and environmental benefits but may offer limited short-term commercial returns.^{4,7,8} Across the private sector, coordination among producers, agribusinesses, financial institutions and value chain actors can help to overcome fragmented incentives, reduce transaction costs and mobilize investment towards shared objectives.^{9,10}

Figure 13 illustrates the complexity of the role of finance in agrifood systems.

Figure 13. Food finance architecture for agrifood systems transformation



Source: **World Bank, IFPRI & FOLU**. 2021. Food finance architecture: Financing a healthy, equitable and sustainable food system. Washington, DC, World Bank. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/Food-Finance-Architecture-Financing-a-Healthy-Equitable-and-Sustainable-Food-System.pdf>

Despite their complementary roles and the interconnected nature of their impacts, public and private investment decisions are often made independently of one another, across multiple institutions, sectors and value chains. As a result, there is a frequent disconnect between national strategies – which increasingly emphasize interlinked objectives such as food security, nutrition, environmental sustainability and employment generation – and the way in which resources are allocated. Public budgets tend to be organized around sectoral programmes and historical spending patterns, while private investments are driven by commercial incentives making it difficult to track and align financial flows around shared priorities.^{2,3,6}

Understanding the interaction between public and private finance is necessary because many of the environmental, health and social costs generated across agrifood systems are not reflected in market prices. These hidden – or “true” – costs, estimated globally at between USD 6 trillion and 12 trillion,⁷ include carbon emissions, biodiversity loss and diet-related health impacts. While private sector investment decisions are guided mainly by financial returns, many of the external costs are incumbent on the public sector through health systems, social protection and climate adaptation measures.⁶

Addressing these wider costs requires an understanding of how financial resources are allocated across agrifood systems, and how public and private investments contribute to different economic, social, health and environmental outcomes.^{4,11} This information can help identify where investments generate benefits and where policy interventions should be prioritized.

Even when governments recognize the need to align public and private finance, they still face practical constraints. These include limited access to information on financial flows across sectors and institutions, difficulties mobilizing additional resources, and weak planning mechanisms that connect policy priorities with sectoral budgeting, private sector investment decisions and implementation arrangements. These challenges help explain why investments often remain misaligned with agrifood systems objectives, despite growing political commitments around the shared objectives of food security, nutrition, climate resilience and job creation.¹²

One way of understanding these constraints is through the concept of the “triple gap” in agrifood systems financing, which highlights three interrelated challenges: a data gap, a finance gap and a planning gap. Beginning with an overview of sources of finance, this module uses the “triple gap” framing to explore how governments can apply a systems approach to finance and systems investment in agrifood systems.^{3,4} It examines the three interrelated challenges and their implications for policy design, finance and investment decisions, and implementation. The module also shares best practices and country examples that illustrate how governments can improve the mobilization, allocation and coordination of finance and investment across sectors and stakeholders. Lastly, the module emphasizes that achieving agrifood systems transformation requires growth in the volume of finance available, as well as public and private investments that are informed by evidence, aligned across policy priorities and coordinated around shared outcomes.

6.2 Categorizing sources of finance and examples of instruments

To understand agrifood systems finance it is necessary to consider where financial resources originate and the instruments through which they are channelled. Sources of finance can be broadly categorized according to whether they are public or private, and whether they are domestic or foreign in origin. Each source plays a distinct role in supporting investments across agrifood systems – from financing public goods and infrastructure to supporting production, value chains, innovation and market development.¹³

Financial resources are channelled through a wide range of instruments, including grants, loans, guarantees, subsidies, equity investments, insurance products, blended finance arrangements and technical assistance. These instruments differ in their objectives, risk profiles, repayment conditions and intended beneficiaries. Each shapes how finance is mobilized and allocated across agrifood systems. Their effectiveness, however, depends not only on their design, but also on the institutional capacities, governance arrangements and implementation mechanisms supporting their delivery. This includes available technical assistance and the broader enabling environment.^{2,6,14}

While categorizing finance by sources helps to clarify different roles and instruments, the boundaries between categories are not always clear-cut. Financial flows frequently overlap, whether from blended finance, public-private partnerships, investment funds sourced from the public or private sector, or domestic and foreign actors.¹⁵ Tracing the origins of finance and tracking finance data can be challenging for governments, particularly in complex agrifood investment programmes.^{4,16} Table 10 provides an overview of the main sources of finance and a selection of the financial instruments commonly used to support agrifood systems transformation.



Discussion with rural women from Nepal during field workshop.

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Table 10. Sources of finance and financial instruments used to support agrifood systems transformation

Source of finance	Domestic	Foreign
Public	Public domestic finance refers primarily to revenues raised through taxation and domestic borrowing. Governments use these revenues to fund public expenditures' financing public goods, correcting market failures, and supporting investments with long pay-back periods, or those targeting underserved populations.	Public foreign finance includes funding from foreign governments through Official Development Assistance (ODA) and finance from multilateral development banks (MDBs). ODAⁱⁱ is government aid that promotes and specifically targets the economic development and welfare of developing countries. MDBs are publicly owned institutions, notable examples of which include the International Fund for Agriculture Investment, the European Investment Bank, the World Bank, the African Development Bank, the Asian Development Bank, the Interamerican Development Bank and the Islamic Development Bank. In recent decades, MDBs have increasingly sought to mobilize private investment alongside their own financing by reducing risks, improving project bankability, and using blended finance and other risk-sharing instruments.^{iii, iv}
	Examples of financial instruments → National budget allocations and public investment programmes → Input, production and consumption subsidies → Public procurement schemes (e.g. school feeding, food reserves) → Price-support and market-stabilization schemes → Domestic public grants → Credit guarantees and risk-sharing facilities capitalized by national governments or development banks → National technical assistance and capacity-development programmes	→ ODA grants and budget support → Concessional loans (MDBs, IFAD) → Non-concessional sovereign loans → Blended finance instruments using public foreign capital → Impact funds → Credit guarantees and risk-sharing facilities backed by MDBs → Climate and environmental funds
Private	Private domestic finance refers to financing from domestic private actors, including loans from commercial banks and other financial institutions, as well as capital market instruments. Farmers, traders and agrifood enterprises invest substantial resources from both formal and informal sources. However, these investments remain poorly measured in many countries, particularly developing countries where digitalized systems and capacities for capturing data remain weak.	Private foreign finance includes foreign direct investment (FDI) and international portfolio investment by foreign or international private investors. It also encompasses private export credits, securities issued by multilateral agencies and remittances. In many developing countries, remittances represent the largest source of external financing.^v Impact investors are also an increasingly important source of private foreign finance for agrifood systems.
	Examples of financial instruments → Commercial bank loans (domestic) → Domestic trade finance → Equity investments in local agribusinesses → Domestic venture capital → Household savings and reinvestment → Insurance and risk-management products (domestic providers) → Domestic philanthropic grants and programme-related investments	→ Portfolio investment (foreign-owned bonds and equities) → Export credits and supplier finance → International trade finance → Remittances → Impact investment and patient capital → Foreign philanthropic grants and programme-related investments

Note: Financial instruments reflect commonly used classifications in agrifood systems, development finance and climate finance literature.

Sources: See [Notes](#) at the end of the module.

6.3 Closing the data, finance and planning gaps in finance and investment

Despite the central role that finance plays in agrifood systems transformation, policymakers continue to face challenges linking finance and investment to defined agrifood systems priorities. A complex mix of public and private sources operating across multiple sectors contribute to policy objectives, but problems can arise when governments' access to information on financial flows is incomplete or inconsistent. This makes it difficult to determine how much finance is reaching specific priorities and the impacts of that finance.^{3,4}

At the same time, there is growing evidence that current levels of finance and investment are insufficient in areas such as healthy diets, environmental sustainability and innovation. Meanwhile, support to small-scale actors remains limited.²

Even when data or sufficient finance are available, some governments still face difficulties translating policy ambitions into cross-sectoral coordinated budget strategies and investment plans. National development plans, climate commitments and agrifood sector policies frequently require ambitious investment needs, but are not always accompanied by realistic assessments of the finance available or the investment required. Such difficulties may be compounded by a lack of institutional capacities and mechanisms needed to coordinate finance and investment plans with policy commitments.¹⁷

These challenges limit the ability of policymakers to measure financial flows, mobilize sufficient resources and successfully align finance with agrifood systems priorities. These challenges reflect a **"triple gap" in agrifood systems financing**¹². This consists of:

- a **data gap** related to measuring financial flows and investment needs, across public and private sectors;
- a **finance gap**, estimated at USD 680 billion annually required to achieve a more sustainable and inclusive agrifood systems transformation;²
- a **planning gap** resulting in a lack of alignment between national targets and the scale, composition and timing of finance that is available and investments needed.

Subsequent sections examine each of these gaps in more detail and suggest actions to address them.

6.3.1 Data gaps in monitoring finance and investments across agrifood systems: challenges and solutions

Determining the volume of finance flowing into agrifood systems, where it comes from and the results it produces, requires the collection and reporting of information in a consistent manner across institutions. This implies common reporting systems, shared terminologies, and mechanisms that allow for the analysis and comparison of information from different sources.⁷ When these elements are absent, governments struggle to develop a complete picture of agrifood systems financing.

Public expenditures relevant to agrifood systems may be spread across the budgets of several sectors, including agriculture, fisheries, forestry, health, nutrition, environment, trade, industry, infrastructure, water and social protection. Private investments can be even more difficult to track, particularly those made by farming households, cooperatives, traders and small enterprises, as these are often not captured in official statistics.^{7,18} The extent of the data gaps varies across countries. For example, a government may have detailed information on spending on subsidies for agricultural production, but much less data on finance allocated to nutrition, biodiversity, food safety, climate resilience or the enabling environment for agribusiness development.

These information gaps affect decision-making.^{19,20} The absence of a clear picture of financial flows makes it more difficult for governments and other stakeholders to identify under-financed priorities, assess whether investments are aligned with policy objectives and determine the amount of additional resources that need to be mobilized. Addressing these challenges requires not only improvements in data collection, but also stronger institutional capacities to manage, analyse and use information across sectors and organizations.

Table 11 presents suggested actions to address data gaps, with examples of their application in different countries and regions.

Table 11. Actions to address data gaps in finance and investment

Suggested action	Example of application
Establish cross-sectoral task teams to harmonize the collection, management and analysis of finance data, including private sector investments, across agrifood systems.	Rwanda's agrifood systems governance architecture , including the Agriculture Sector Working Group (ASWG) and inter-ministerial coordination mechanisms, brings together ministries responsible for agriculture, finance, environment, local government and development partners to review expenditure priorities and monitor implementation of agricultural and food systems programmes. The system has helped improve coordination of investment planning and expenditure tracking across institutions. ⁱ
Strengthen statistical, analytical and digital capacities within ministries and public institutions to analyse financial flows and generate evidence to support investment decisions.	Chile's Office of Agricultural Studies and Policies (ODEPA) was established to strengthen evidence-based agricultural policymaking. It provides economic analysis, market intelligence, investment assessments and policy evaluation to support government decisions. It acts as a bridge between statistics, economics and policy implementation. ⁱⁱ
Align reporting approaches, terminologies and classifications to improve transparency, communication and comparability.	The European Union's Common Agricultural Policy (CAP) enables Member States to use common reporting frameworks and classifications for agricultural expenditure and results monitoring. CAP is one of the best-known examples of harmonized reporting across multiple jurisdictions, with tools that can be adapted to national and subnational levels. ⁱⁱⁱ
Invest in digital information systems and artificial intelligence tools that allow financial data from multiple institutions to be consolidated, analysed and communicated clearly to policymakers.	Indonesia's One Map Policy integrates information from multiple ministries onto a common digital platform to improve planning and reduce inconsistencies across sectors. Although not focused solely on finance, the policy demonstrates how information from different institutions can be consolidated to support decision-making. ^{iv}

Source: Adapted from **CPI & FAO**. 2024. *The triple gap in finance for agrifood systems*. Revised. Rome. <https://doi.org/10.4060/cd3611en>; i. **Wigboldus, S., Guijt, J. & Garcia-Campos, P.** 2021. *Rwanda's journey towards sustainable food systems*. Rome, FAO. <https://doi.org/10.4060/cb6057en>; ii. **ODEPA (Oficina de Estudios y Políticas Agrarias, Chile)**. 2024. *About ODEPA*. Santiago, Ministry of Agriculture. www.odepa.gob.cl; iii. **European Commission**. 2023. *The Common Agricultural Policy: An overview*. Brussels, European Commission CAP Network. https://eu-cap-network.ec.europa.eu/common-agricultural-policy-overview_en; iv. **WRI (World Resources Institute, Indonesia)**. 2021. *One Map Initiative at the Local Level*. Jakarta. <https://wri-indonesia.org/en/initiatives/one-map-initiative-local-level>

6.3.2 Finance and investment gaps: Challenges and solutions

The financing available for agrifood systems transformation has not kept pace with persistent levels of hunger, food insecurity and climate risks. Current levels of finance remain insufficient to support the scale of transformation required, with recent estimates indicating that USD 680 billion per year is needed to achieve food security and climate resilience objectives.^{2,4}

The finance gap refers not only to a shortage of resources but also to how resources are distributed and allocated. Investment policies and programmes often fail to reach the countries and communities facing the highest levels of food insecurity and climate vulnerability, many of which also have high debt burdens and limited affordable finance.⁴

Gaps in public resources also act as a constraint on enabling environment reforms, which allow businesses, financial institutions and producers to invest with greater confidence. Governments' inability to invest in public goods such as rural infrastructure, research and extension services, food safety systems or climate adaptation, reduce the attractiveness of investment opportunities and the flow of private capital into these areas.¹⁴

Similarly, private investment does not always flow towards activities that generate the greatest social or environmental benefits. Investments are more likely to be directed towards commercially viable activities with short-term returns. Areas such as social protection, environmental and nutrition-sensitive interventions, and support for small-scale producers, frequently remain underfinanced.^{21, 22} As a consequence, private investments do not always align with government's national agrifood systems objectives.

In addition to insufficient finance and investment, there are also gaps in distribution and targeting. At the national level, finance can fail to reach the sectors and actors most in need, while debt constraints, limited fiscal options and underdeveloped financial markets further restrict investment. As a result, public finance and investment frequently fall short of the amounts required for agrifood systems transformation.

Table 12 presents suggested actions to address the finance gap, with examples of their application in different countries and regions.¹²

Table 12. Actions to address the finance gap in agrifood systems transformation

Suggested action	Example of application
Develop financing strategies that combine public, private, domestic, international, climate and development finance to support agrifood systems priorities.	The Comprehensive African Agriculture Development Programme (CAADP), a policy framework for Africa's agricultural transformation, includes National Agricultural Investment Plans (NAIPs) and National Agrifood Systems Investment Plans (NASIPs), in order to align domestic budgets, donor finance, private investment and development finance around agreed national priorities. ⁱ
Integrate true-cost accounting tools into public investment planning and expenditure reviews , in order to identify environmental, health and social costs and benefits that are not reflected in market prices. Support the redirection of finance towards activities that generate long-term benefits for food security, nutrition, climate resilience and natural resources.	India has applied TEEBAgriFood assessment approaches to evaluate environmental and health costs associated with agricultural production systems, helping policymakers understand trade-offs that are not reflected in market prices. ⁱⁱ
Strengthen the enabling environment for investment through predictable policies, transparent regulatory frameworks, risk-sharing mechanisms and public investments that help crowd in private finance.	Brazil's ABC Programme (Low Carbon Agriculture) combines concessional loans, technical assistance and policy support to encourage private investment in sustainable agricultural practices. Public finance has reduced risk and helped attract commercial lending.
Strengthen capacities to mobilize domestic, international, public and private finance , including through blended finance, climate finance, development finance institutions and investment partnerships. ⁱⁱⁱ	Zambia's Comprehensive Agriculture Transformation Support Programme (CATSP) seeks to improve capacities to explicitly align public budgets, development partner finance, private investment and financial institutions around common agricultural transformation objectives. ^{iv}
Promote financing mechanisms for under-invested priorities , including social protection, nature-based solutions, climate adaptation, food safety, nutrition-sensitive interventions, and support for small-scale producers and agrifood enterprises.	The European Union's LEADER Programme provides financing for small-scale rural enterprises, producer organizations, innovation and community-led development initiatives that often struggle to access conventional finance. ^v

Sources: Adapted from **CPI & FAO**. 2024. *The triple gap in finance for agrifood systems*. Revised. Rome. <https://doi.org/10.4060/cd3611en>
See [Notes](#) at the end of the module.

6.3.3 The planning gap – linking policy priorities to finance and investment: Challenges and solutions

The planning gap refers to the disconnect between policy commitments and the financing strategies required to achieve them.¹² While many countries have adopted ambitious targets related to agrifood systems transformation, these commitments are not always translated into costed investment plans, or a public budget capable of delivering them.^{3, 6}

Unlike the data gap, which concerns understanding financial flows, and the finance gap related to availability of resources, the planning gap explores the “how-to” of translating priorities into financing and investment decisions. In practice, governments identify priorities for agrifood systems, yet lack clear estimates of financing needs, investment pipelines, or the mechanisms for coordinating them across institutions and sectors.^{3, 4, 6}

Without the tools to coordinate and track expenditures, governments may struggle to determine whether finance and investments collectively support national priorities or if important objectives remain underfunded.^{2,4}

Weak planning can also constrain finance mobilization. Private investors, development finance institutions, climate funds and development partners typically require clearly defined priorities, costed programmes and implementation arrangements before committing resources. When these are absent, countries may struggle to attract investment. The challenge is therefore not always a lack of finance, but a lack of investment-ready plans capable of mobilizing and directing available resources towards agreed objectives.¹⁴

Ministries of finance and planning cannot be expected to address these challenges alone. Employing a systems approach to planning requires expertise beyond the traditional remit of budget authorities. In the case of agrifood systems, finance planning will rely on collaboration between finance and planning ministries and sectoral ministries and specialized agencies responsible for agriculture, health, nutrition, environment, trade, infrastructure and social protection. This level of collaboration helps ensure that financing decisions are informed by technical evidence, sector priorities and implementation realities. Collaboration is also needed to ensure that finance is prioritized for objectives that will generate multiple outcomes simultaneously³ – for example, ensuring that investments in climate-resilient agriculture also contribute to food security, nutrition, rural livelihoods and biodiversity conservation.

Existing initiatives that use cross-sectoral budgeting, such as gender, green growth or SDG budgeting initiatives, provide useful lessons on closing the planning gap for financing.¹⁷ Similar to agrifood systems, these approaches emerged from the recognition that cross-cutting policy priorities were often weakly reflected in budget processes, despite strong political commitments.

Experiences from OECD countries show that governments frequently underestimate the resources required to establish new planning systems for cross-sectoral financial planning, which require new or adapted analytical methodologies, trained staff and sustained coordination across institutions over time (see Module 3 for insights on cross-sectoral coordination). Barriers to implementing cross-sectoral strategic budgeting reforms include shortages of staff, time, analytical expertise and technical capacities.¹⁷

Strengthening links between policy objectives and public spending will also require adjustments to existing technical processes, such as the use of budget tagging, expenditure reviews, performance frameworks and cross-ministerial coordination mechanisms.¹⁷

Addressing the planning gap therefore requires stronger integration between policy design, budgeting, investment planning and resource mobilization. It also demands investments in capacities, institutional strengthening, analytical tools and coordination mechanisms needed to translate policy commitments into realistic budgets and investment plans.¹²

Ultimately, the objective is not to create additional planning processes, but to improve the quality of investment decisions and strengthen alignment between public spending, private investment and national development priorities.

Table 13 presents suggested actions to address the planning gap, with examples of their application in different countries and regions.¹²

Table 13. Actions to address the planning gap in finance and investment

Suggested action	Example of application
Develop costed agrifood systems investment plans and investment pipelines that translate policy commitments into sequenced programmes, financing requirements, implementation responsibilities and potential sources of finance.	Rwanda's Strategic Plans for Agriculture Transformation (PSTA 4 and PSTA 5) provide one of the strongest examples of translating policy priorities into costed programmes with clearly defined implementation responsibilities, financing requirements, indicators and monitoring arrangements. The plans have been used to guide government budgets, donor investments and private sector engagement. ⁱ
Align national investment priorities with regional and global frameworks such as CAADP, Nationally Determined Contributions (NDCs), National Food Systems Pathways and other regional agreements, to strengthen policy coherence, facilitate access to finance and reduce duplication of planning efforts.	In Mozambique , recent revisions to agricultural and food systems planning have sought stronger alignment between CAADP commitments, national development priorities, climate strategies and investment planning frameworks. ⁱⁱ
Establish dedicated planning and finance working groups to coordinate investment planning across ministries and stakeholders.	Finland's National Food Policy Process established cross-government coordination mechanisms involving agriculture, health, environment, education and economic ministries, to align planning and investment decisions related to food systems. ⁱⁱⁱ
Introduce strategic budgeting approaches for agrifood systems , building on lessons from gender budgeting and green budgeting, to track expenditures across sectors, assess their contribution to agrifood systems objectives and strengthen accountability for results.	New Zealand's Wellbeing Budget is one of the most frequently cited examples of strategic budgeting globally. Budget decisions are assessed against broader social, environmental and economic objectives rather than sector outputs alone. ^{iv}
Develop monitoring and review mechanisms that link policy targets, investment plans and expenditure decisions , enabling governments to adjust priorities and resource allocations as circumstances and evidence evolve.	The CAADP Biennial Review Process is one of the strongest examples of a monitoring and review mechanism globally. Countries report against agreed indicators, targets and commitments, allowing governments to assess whether policies, investments and implementation are progressing as planned. ^v

Sources: See [Notes](#) at the end of the module.

Addressing systems investment using the triple-gap framing is useful for helping policymakers move beyond a sole focus on increasing investment. By incorporating collaborative action and capacity development, it helps policymakers better align financial flows and planning processes with policy objectives. This enables investments to be better measured and directed towards priority policy objectives.

Building on the above discussion of data, finance and planning gaps, the following sections provide practical guidance and country examples that show how governments can apply a systems approach to the mobilization, allocation and management of finance and investment within agrifood systems.

6.4 Good practices on public sector leadership for mobilizing and aligning finance and investment

Public sector leadership plays an important role in shaping how different sources of finance, and public and private sector investment, are mobilized and allocated across agrifood systems. Through a variety of instruments, including fiscal policies, public investment, incentives, guarantees and regulatory frameworks, governments can direct resources towards activities that support food security, nutrition, environmental sustainability, climate resilience and rural livelihoods. These instruments can also help reduce risks associated with innovation, strengthen access to finance for small-scale producers and agrifood enterprises, and encourage greater private sector participation in priority areas.^{7, 23}

The following good practices and country examples illustrate how public sector leadership can operationalize these functions. While each practice targets a specific aspect of finance and investment, together they contribute to a systems approach to investment, consistent with the six elements outlined in FAO's *Transforming Food and Agriculture through a Systems Approach*.³

6.4.1 Optimize the alignment between public sector budgets allocations and agrifood systems priorities (*Systems Thinking*)

Many countries experience a disconnect between agrifood systems policy priorities and the allocation of public expenditures. While national strategies emphasize objectives such as food security, nutrition, climate resilience, environmental sustainability and employment generation, budgeting is often organized around ministries, programmes and conventional spending patterns rather than cross-cutting outcomes.^{3, 6} In such cases, public funds are often tied to spending patterns that are institutionally entrenched or politically difficult to reform, even where evidence suggests that alternative allocations could generate greater economic, social, nutritional or environmental returns.^{24, 25}

Moving beyond incremental budgeting requires stronger links between policy priorities, expenditure decisions and desired outcomes. This includes the use of strategic budgeting approaches, expenditure reviews and investment-planning tools that assess alternative budget scenarios and help policymakers align public spending with agrifood systems objectives.^{17, 20}

The Policy Optimization Tool (PolOpT), described in Box 29, was developed to address these challenges. The tool facilitates public expenditure analyses, linking the results to a range of agrifood systems scenarios using simulation modelling to compare alternative allocations.

Box 29

Using policy optimization to align agrifood budgets with system-wide priorities

Policy optimization tools offer a structured way to support governments in aligning public budget allocations with agrifood systems priorities. The Policy Optimization Tool (PoOpT) combines three elements:

- **real public budget structures**, reflecting how governments currently allocate resources across agrifood-related instruments;
- **economy-wide modelling**, capturing impacts on production, employment, incomes and prices;
- **multi-objective assessment**, evaluating trade-offs across priorities such as growth, poverty reduction and access to healthy diets.

Rather than taking additional fiscal space, PoOpT works within existing budgets to identify alternative ways of allocating finance that perform better across multiple objectives. In so doing, the tool can contribute to improving the efficiency of public spending, thereby enhancing agrifood system outcomes while also strengthening coherence between agricultural, nutrition, environment and economic goals.

Source: **FAO**. n.d. Policy Optimization Tool (PoOpT). In: *Monitoring and Analysing Food and Agricultural Policies*. Rome [Cited 18 June 2026]. www.fao.org/in-action/mafap/what-we-do/policy-prioritization/poLOPT/en

6.4.2 Pool public resources to address intersectoral agrifood system objectives (*Systems Governance*)

Recognizing the limitations of traditional sector-based budgeting, some countries treat cross-sectoral challenges – such as health, nutrition and environment – as explicit national priorities that require flexible and collaborative financing arrangements.²⁶ In such cases, effective interministerial coordination is often a prerequisite for pooling and aligning public resources across ministries.

One way in which this can be achieved is through a cross-sectoral programme that brings together the resources and mandates of multiple ministries around a common objective. School feeding initiatives provide practical examples of ways of aligning budgets across ministries,²⁵ while delivering outcomes that span nutrition, education, health and local food systems.²⁷ For example, **Sri Lanka** is developing a sustainable financing mechanism for its national school meal programme through a cross-ministerial budget framework, with implementation targeted for 2030.²⁸

In another example, from Denmark, the municipality of Varde has experimented with allocating dedicated funds for the health sector that can be flexibly distributed across departments. Rather than assigning resources to a single sector, this approach is designed to encourage cross-sectoral collaboration on health-related initiatives and to enable more integrated responses to complex challenges (see Box 30).

Box 30

Allocating financial resources to promote cross-sectoral collaboration in Varde, Denmark

The case of the **Fund for Health** in Varde, Denmark, demonstrates how dedicated funding can facilitate cross-sectoral collaboration, particularly in the context of an intersectoral health policy. Initially, implementation of the policy faced challenges due to a lack of allocated resources. This was addressed by the establishment of the Fund for Health, with an initial budget of 1 million Danish kroner, which provided a tangible incentive for different departments in the municipality to work together on health-related projects.

Various departments were able to apply for funding, provided their projects involved collaboration between at least two sectors – not necessarily including the health sector – such as education and social welfare. Stakeholder interviews revealed that the fund encouraged intersectoral collaboration and helped break down budgetary barriers.

This fund was complemented by the creation of **Health Networks**, information-sharing platforms aimed at disseminating project-level knowledge and results throughout involved sectors. The networks fostered further collaboration and raised awareness about health-related interventions. They enabled project teams to share results, challenges and lessons learned, helping to normalize intersectoral collaboration over time. Importantly, the combination of earmarked resources and structured learning mechanisms reduced the transaction costs of collaboration, often cited in the literature as a key barrier to “Health in All Policies” (HiAP) implementation.

By offering financial resources, the Fund for Health motivated sectors to collaborate on health initiatives, making health a shared responsibility rather than solely the priority of the health sector. The fund and the associated Health Networks proved crucial in ensuring the success of Varde’s intersectoral health policy, providing both financial resources and an organized platform for ongoing cross-sectoral dialogue.

Evaluations and stakeholder interviews found that the availability of dedicated funding not only incentivised collaboration but also enhanced accountability, as projects were expected to demonstrate cross-sectoral engagement and health-relevant outcomes. Together, the Fund for Health and the Health Networks played a critical role in embedding intersectoral practice within routine municipal governance, contributing to the longer-term sustainability of Varde’s intersectoral health policy.

Sources: **Holt, D.H. & Ahlmark, N.** 2018. Intersectoral governance for health at the local level: Lessons from Danish municipalities. *Scandinavian Journal of Public Health*, 46(22): 26–33; **WHO.** 2014. *Health in All Policies (HiAP) Framework for Country Action*. Geneva. www.afro.who.int/sites/default/files/2017-06/140120HPRHiAPFramework.pdf

6.4.3 Assess the suitability of instruments like blended finance to mobilize private sector investments (*Systems Doing*)

Blended finance refers to the strategic use of public, development finance or philanthropic capital to mobilize private investment in support of development objectives. It usually combines different types of financial instruments, such as those listed in Table 9. Blended finance can, for instance, support the mainstreaming of innovative approaches or technologies – such as regenerative agriculture or sustainable land use practices – which are often perceived by private investors as too risky, unproven or too long-term.²⁹

By providing early-stage funding to improve viability and build investor confidence, blended finance can offer partial risk coverage.^{2,29} This could take the form of guarantees or flexible, low-cost financing – commonly referred to as concessional finance. These instruments lower entry barriers for private investors and encourage co-investment,^{29,30} which can help mobilize additional investment for activities that generate environmental, social and resilience benefits alongside financial returns.

In situations where investment risks are driven by weak governance, political uncertainty or conflict, risk-sharing mechanisms alone may be insufficient to attract private investors.³¹ For these reasons, blended finance can form part of a broader financing strategy that combines public expenditure, development finance, private investment and policy reforms. The choice of financing instrument needs to be guided by the nature of the investment, the expected co-benefits for the public and private actors, and the extent to which private capital can realistically contribute to the achievement of policy objectives.³¹

The Tropical Landscapes Finance Facility (see Box 31) illustrates how blended finance can operate in practice. By sharing risk and providing supportive financing structures, the facility has successfully mobilized investment for projects in sustainable agriculture and environmental restoration, demonstrating how public and private finance can be combined to advance agrifood systems transformation.⁶

Box 31 The Tropical Landscapes Finance Facility (TLFF) – catalysing investment in sustainable land use

The **Tropical Landscapes Finance Facility (TLFF)** is a pioneering blended finance initiative designed to mobilize capital for sustainable land use and green growth in Indonesia. It is noted for its innovative approach to managing risk, which has attracted a range of investors into sectors that are typically seen as too risky – including sustainable agriculture and renewable energy. The TLFF combines two key components:

- A **loan fund** provides early-stage finance and advisory guidance for projects during the high-risk development phase.
- A **grant fund**, managed by UNEP and World Agroforestry, supports technical assistance to build a pipeline of bankable projects.

Once projects become financially stable and begin generating steady cash flows, the TLFF can refinance them by issuing bonds in the capital markets. This “recycling” of capital allows the facility to fund additional projects over time.

One flagship example is a USD 95 million loan issued in 2018 to support a sustainable rubber plantation in Indonesia. Backed by a US Government credit guarantee, the loan was later converted into Asia’s first corporate sustainability bond, which represented a landmark achievement demonstrating how public guarantees can help unlock private capital for agrifood transformation.

Source: **FAO**. 2025. *Innovative finance for agrifood systems transformation*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cd5067en>

6.4.4 Finance public agrifood research institutions to ensure broad multistakeholder access to scientific and pre-competitive knowledge (*Systems Knowledge*)

Financing public agrifood research and development (R&D) remains central to informing the broad spectrum of agrifood-related policies – and the development of context-specific solutions tailored to local ecological, social and institutional needs.³² The generation of independent, publicly accessible knowledge reduces information asymmetries and innovation risks. Public R&D also supports investments in the scaling of innovations by generating the evidence needed to justify public and private resources. By demonstrating the technical, economic, environmental and social performance of new technologies and approaches, research helps build confidence among investors and policymakers, increasing the likelihood of finance and investment flows to upscale innovations.³³

In Ireland, for instance, “resolute public sector support”³⁴ for public investment in agriculture research means that the country’s national agriculture research institute (Teagasc) can rely on public sector funding for 70 percent of its research budget. This type of commitment contributes to the impartiality of research findings for industry and consumers,^{3,4} and pre-competitive knowledge for investors interested in the sustainable growth of agrifood systems (see Box 32).

Box 32 Public sector investment in agrifood research in Ireland

In Ireland, sustained public sector investment in a nationally integrated approach to agricultural research and education has been a key driver in enhancing system-wide innovation, ensuring a consistent pipeline of high-quality expertise for the sector. This investment covers approximately 70 percent of the research budget of the national agriculture research institute, Teagasc. Beyond safeguarding the integrity of research outputs, this public support has contributed significantly to the strength and performance of Ireland’s Agricultural Knowledge and Innovation System (AKIS). Notably, in 2015, Ireland was ranked as having the fifth most innovative agrifood sector in the European Union. The same analysis¹ found that Ireland’s more innovative farms were associated with higher incomes, larger landholdings, lower dependency on subsidies, greater investment levels and a younger farming demographic.

Source: Brouwer, H., Guijt, J., Kelly, S. & Garcia-Campos, P. 2021. *Ireland’s journey towards sustainable food systems: The processes and practices that made a difference*. Rome, FAO. <https://openknowledge.fao.org/server/api/core/bitstreams/05f7b7b3-fb51-43f2-a37a-4bd215b51b40/content>; i. Renwick, A., Läpple, D., O’Malley, A. & Thorne, F. 2014. 2014. *Innovation in the Irish agrifood sector*. University College Dublin. www.researchgate.net/publication/264314553_Innovation_in_the_Irish_Agrifood_Industry

6.4.5 Increase access to affordable and tailored financial and business services for small-scale value chain actors (*Systems Doing*)

Small-scale producers and agrifood SMEs are central to food security, employment, environmental resilience and economic growth in many developing countries. More than 90 percent of the world's farms are family farms, with small farms accounting for approximately 84 percent of all farms globally and producing around one-third of the world's food despite operating only 12 percent of agricultural land.³⁵ Representing one of the largest untapped investment opportunities in agrifood systems, the current siloed structure of financial systems nevertheless underserves these actors – due to risk perceptions, weak business and market services, and misaligned financial flows.^{2,8}

Unlocking these opportunities for more inclusive agrifood systems transformation requires practical shifts. Specific changes include reducing risks for lenders through tools like guarantees and co-financing – for instance with blended finance³¹ tools, contract farming³⁶ and agriculture insurance schemes.³⁷ Finance can also be made more affordable and accessible for smaller firms located in rural and isolated areas, through microfinance, savings schemes and mobile banking services.^{8,38}

Improving basic business advisory services and market connections can also help improve the flow of finance to small actors.^{39–41} Building business capacities, including financial histories and credit profiles,^{7,42} can also increase access to finance and investment for growth and scaling.⁴²

Policy responses also include fintech solutions,⁴³ which have become more mainstream within agrifood systems. Fintech consists of digital tools and platforms that use technology to deliver, improve or expand access to financial services, including for actors traditionally excluded from formal financial markets. Improving the role of fintech in agrifood systems transformation requires supportive regulation, targeted public investment in pre-competitive infrastructure and partnerships with financial service providers.^{7,43}

Box 33 provides an example from Kenya illustrating how public financing combined with institutional support – through incentives, capacity building and inclusive governance – can help protect public ecosystems while fostering more inclusive and sustainable agrifood investment.

Box 33 Public investment and community-led mangrove restoration in Kenya

In Kenya's Lamu archipelago, public and community efforts have combined to address severe degradation of the mangrove ecosystem. Mangroves store up to 10 times more carbon per hectare than terrestrial forests. This makes them vital not only for climate mitigation, but also for biodiversity, fishery livelihoods and coastal protection.

Kenya's public sector, through agencies like the Kenya Forest Service and research institutions, has partnered with NGOs and women's groups to support mangrove restoration through microfinance and training. Women receive small business loans linked to conservation training, helping them to establish income-generating activities while restoring the ecosystem.

This initiative highlights how public financing and institutional support can protect public goods like ecosystems, while empowering local communities through incentives, capacity building and inclusive governance.

Source: Kamadi, G. 2021. Green growth: The save-the-mangrove scheme reaping rewards for women in Kenya. *The Guardian*, 24 May 2021. London. [Cited 5 May 2025]. www.theguardian.com/global-development/2021/may/24/green-growth-the-save-the-mangrove-scheme-reaping-rewards-for-women-in-kenya

6.4.6 Combine policy and fiscal actions for true cost accounting (Systems Knowledge)

True-cost accounting (TCA) approaches can help governments incorporate environmental, health, and social costs and benefits into public spending and investment decisions. By informing poverty and nutrition metrics, social protection programmes and public food procurement strategies, TCA can help direct resources towards activities that generate multiple benefits across agrifood systems. For example, scaling nutrition-sensitive social protection systems can strengthen the financial resilience of vulnerable populations while improving access to healthy diets.⁴

True-cost accounting approaches can contribute to the reduction of trade-offs across policy objectives, and ensure that limited public resources contribute simultaneously to nutrition, environmental sustainability and equity goals. Governments can promote true cost accounting in agrifood systems using the policy tools and analytical frameworks shared in Box 34.

Box 34 The role of governments in addressing the true costs of agrifood systems

Governments can address the true costs of agrifood systems through a range of policy and fiscal actions.

Integrating true costs into policy and fiscal decision-making. Embedding true cost accounting into agricultural, food and environmental policies helps ensure that decisions reflect hidden costs, such as health impacts and environmental degradation, and benefits such as ecosystem services, thereby improving resource allocation, regulation and investment planning.

Redirecting subsidies and public spending away from harmful practices. Shifting financial support away from practices that degrade soils, water, biodiversity or nutrition, and prioritizing sustainable production methods, helps realign incentives and ensure that public funds deliver long-term benefits for people and ecosystems.

Applying fiscal tools to promote sustainable choices. Instruments such as taxes on harmful inputs, tax exemptions for climate-smart technologies, or incentives for the production of healthy foods, can influence both producer and consumer behaviour towards more sustainable outcomes.

Creating mechanisms to reward positive outcomes. Governments can establish payment schemes, public procurement programmes or certification incentives that reward farmers and enterprises for delivering outcomes such as carbon sequestration, ecosystem restoration, biodiversity conservation, or the provision of safe and nutritious food.

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Building capacities for a systems approach to policymaking



Suggested duration: 2 hours
Presentation: 45 minutes
Learning Lab: 45 minutes
Wrap-up and Q&A: 30 minutes

Module abstract

This module explores the role of public sector capacities in designing and implementing agrifood systems policies within an increasingly complex and interconnected policy environment. Mounting pressures on agrifood systems require governments to build the capacities needed to move beyond sector-specific approaches. Drawing on established “policy capacity” frameworks, the module distinguishes between three interrelated sets of capacities: analytical-technical, operational and political. Using country examples, the module also examines how these capacities can strengthen the design and implementation of agrifood systems policies across sectors and stakeholders. This module builds on FAO’s *Transforming Food and Agriculture through a Systems Approach*.¹ It aims to strengthen public sector capacities to apply *Systems Learning* in policymaking for agrifood systems transformation.

Learning objectives

- Understand the role of public sector capacities in designing and implementing agrifood systems policies.
- Learn about public sector assessment tools for appraising policy capacities.
- Explore “policy capacities” and the distinguishing features of analytical-technical, operational and political capacities.

Learning Lab

Defining the task

Participants are invited to evaluate their organization’s capacities, identifying strengths and gaps.

Activities

- In groups, participants reflect on the case from Brazil detailed in [Box 37](#).
- Participants discuss their organization’s capacities, employing the analytical-technical, political and operational categories described in [Section 7.3](#) to identify strengths and gaps.
- Each group creates a chart with rows similar to [Table 15](#), determining core capacities of their organization applicable to a systems approach. Using specific examples, they identify where a systems approach may already be in place, and where gaps may need to be addressed.
- Each group then presents its findings to the main discussion group.
- Following the presentations, the participants are encouraged to commit to at least one analytical-technical, political and operational action, to improve their organization’s capacities.

7.1 Key concepts – core capacities for a systems approach to policymaking

The interconnected nature of the challenges facing agrifood systems, related to food security, climate change, nutrition and livelihoods, have increased the need for public sector capacities that facilitate work across sectors, institutions, disciplines and stakeholder groups.^{1,2}

Capacities have long been recognized as a source of competitive advantage in the private sector.⁴ In contrast, government reforms emphasizing the delivery of “more with less”,³ have, in some contexts, contributed to an erosion of public sector capacities. Recently, however, growing attention has been given to the role of individual (policymakers and administrators) and institutional (ministries, departments and public agencies) capacities in enabling the design and implementation of public policies to improve outcomes for society.⁵

Over the last few decades, the concept of “policy capacity”^b has become central to understanding how governments design, implement and adapt policies. Policy capacity can be defined as *the set of skills and resources – or competences and capabilities – necessary to perform policy functions*.⁵ More broadly, it is referred to as “government’s arrangements to review, formulate and implement policies”.⁶ Although the academic literature distinguishes between concepts such as capacities, capabilities,^c abilities, competencies and skills, these terms are often used interchangeably (see Box 35).

Box 35 Definition of capacity

The OECD defines “capacity” as “the ability of people, organizations and society as a whole to manage their affairs successfully”, and capacity development as “the process whereby people, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time”.

Source: **OECD**. 2006. *The challenge of capacity development: Working towards good practice*. DAC Guidelines and Reference Series. Paris, OECD Development Assistance Committee (DAC). www.oecd.org/dac/capacity-development/36326495.pdf

^b In the public administration literature, policy capacity is the overarching potential of a government (or any policymaking system) to perform the full range of policy functions – from agenda-setting through to implementation and evaluation. Policy capabilities are the concrete resources and routines (e.g. technical know-how, skills, information systems, staff structure, legal mandates, etc.) that make that potential real. In this Handbook, these two terms are used interchangeably.

^c In recent public administration scholarship, the concept of dynamic capabilities has emerged as a key lens for understanding how governments adapt to complex agrifood and other systemic challenges.¹² The concept originally comes from the field of strategic management, particularly from the work of David Teece, Gary Pisano and Amy Shuen in the 1990s. Their research focused on how firms can achieve and sustain competitive advantage in rapidly changing environments by continuously renewing their capabilities. Over time, this concept has been adapted to the public sector, where the need for adaptability and responsiveness is equally critical.

Within the context of agrifood systems transformation, policy capacity extends beyond the traditional administrative functions of government. As discussed in Module 1, a systems approach requires public sector actors to develop additional capacities that enable them to:

- coordinate policy objectives and programmes across several institutions and sectors;⁵
- provide public sector leadership and convene multiple state and non-state actors, while advocating for the prioritization of agrifood systems transformation;
- identify cross-sectoral synergies while managing trade-offs between competing objectives⁷ (e.g. between promoting investment in agri-processing for sectoral and job growth, while ensuring the availability of affordable and healthy food for local populations).

Together, these functions illustrate the breadth of capacities required within government to design, coordinate and implement agrifood systems policies⁵. These capacities, in turn, need to draw on a diverse set of analytical-technical, operational and political skills that enable policymakers to work across sectors, manage trade-offs and build consensus.^{7,8} These can be described as follows:^{5,9}

- **Analytical-technical capacities** enable the generation of evidence, the diagnosis of complex problems, the assessment of policy options and the design of policy responses.
- **Operational capacities** support the mobilization of resources and the translation of policies into implementable and scalable programmes.
- **Political capacities** allow policymakers to engage high-level support, coordinate agendas across actors, and sustain policy action and commitment across government and stakeholders over time.

This module begins with a discussion of capacity assessments, providing examples of tools that can be used to identify capacity strengths and gaps that may constrain progress.¹⁰ It also describes analytical-technical, operational and political capacities, explaining how these capacities can be adapted to support a systems approach for agrifood systems transformation, offering illustrative examples of their application.

7.2 Assessing strengths and gaps in public sector capacities

Strengthening capacities for agrifood systems transformation begins with appraising existing strengths and identifying gaps that may be constraining a systems approach. Capacity assessment tools can support this process by comparing desired capacities against those currently in place. Assessments can also help discern whether gaps are systemic – cutting across sectors and institutions – or concentrated within specific functions or policy areas.^{7,8}

Assessments can also be structured around the public sector's ability to generate and use evidence (*analytical-technical capacity*), to design and implement policies and programmes (*operational capacity*), and to coordinate actors, align interests and sustain commitment across institutions (*political capacity*).

Experiences from international practice illustrate the value of assessments. For example, the European Union (EU) uses public administration capacity assessments to evaluate the ability of pre-accession countries to manage funds and align with EU policy standards. These assessments examine capacities across analytical, operational and political capacities, assessing core functions such as planning, design, implementation, and monitoring and evaluation. This process helps determine where EU resources can be effectively deployed and where targeted support is needed to address capacity constraints.⁸

Beyond identifying strengths and gaps, assessments can also inform a range of follow-up actions relevant to agrifood systems transformation. These can include adapting public sector recruitment strategies to address analytical and technical skills gaps, strengthening institutional arrangements for implementation, and establishing coordination mechanisms or task teams to support cross-sectoral collaboration.

In practice, capacity strengthening may involve a range of measures, such as recruiting specialized expertise, partnering with academic and training institutions, and promoting on-the-job learning through joint initiatives and peer-to-peer exchange. Ultimately, assessments have one main objective: to guide governments on how to equip policymakers and public institutions with the analytical, operational and political capacities they need to design, implement and evaluate agrifood policies capable of addressing complex, interdependent challenges across the system.⁵

A range of frameworks and tools are available to help institutions assess existing capacities. Table 14 summarizes four examples of capacity assessment tools – two applied internally by institutions and two used externally with the potential for adaptation to different country contexts (see the sources for more details on the findings from these examples and methodological approaches). Findings from assessments undertaken for the European Union and the United Kingdom have been published, while only limited findings have been shared publicly for the assessments carried out for the OECD and Chile's government laboratory.

The next section examines analytical-technical, operational and political capacities in more detail.

Table 14. Examples of public sector capacity assessment tools

	Internal assessments	External assessments
Results publicly available	The European Union's innovation barometer piloted a survey-based assessment on innovation in public services in 2010. The survey was carried out among 4 000 organizations across Europe, with the results aggregated at country level. ⁱ	The UK government's Capability Review Programme, launched in 2005, focused on assessing capabilities in three areas: leadership, strategy and delivery. An external team was set up by the Cabinet Office, and the results were published as a report. ⁱⁱ
Limited results available publicly	The OECD's Observatory of Public Sector Innovation (OPSI) internal assessment tool for public sector innovation allows organizations to map innovations across four areas: enhancement-oriented, mission-oriented, adaptive and anticipatory innovations. ⁱⁱⁱ	Chile's Government Laboratory (Laboratorio de Gobierno) carries out public sector innovation assessments based on surveys filled out by organizations, who receive tailored feedback on capacities that require strengthening. ^{iv}

Sources: i. **European Commission, Directorate-General for Enterprise and Industry**. 2011. *Innovation Union Scoreboard 2010: The Innovation Union's Performance Scoreboard for Research and Innovation*. Brussels. <https://data.europa.eu/doi/10.2769/11849>; ii. **National Audit Office**. 2009. *Assessment of the Capability Review Programme*. HC 123. London.; iii. **OECD OPSI**. 2022. *Portfolio Exploration Tool*. In: *Observatory of Public Sector Innovation (OPSI)*. Paris.; iv. **Laboratorio de Gobierno**. 2019. *Índice de Innovación Pública*. In: *Laboratorio de Gobierno, Ministerio de Hacienda*. Chile. [Cited 15 June 2026].

7.3 Core capacities for agrifood policymaking

The increasingly interconnected and dynamic nature of agrifood systems is reshaping the capacities required for effective policymaking. Because these systems span multiple governance levels, technical disciplines and sectors,¹ public institutions need to remain agile, continuously adapting and strengthening their capacities to respond to evolving contexts, including conflict, political uncertainty, climate change and technological disruption.¹¹⁻¹³ Policymakers therefore need to draw on a broad and interconnected set of analytical-technical, operational and political capacities to design, coordinate and implement integrated policy responses.^{5, 12, 13} These three categories of capacities are described below and summarized in Table 15. Together, they are consistent with, and support the implementation of the systems approach outlined in *Transforming Food and Agriculture through a Systems Approach*.¹

Analytical-technical capacities

Analytical-technical capacities comprise the specialized knowledge and skills required to perform technical functions across the agrifood sector – from production and processing to regulation, distribution and consumption. These capacities enable governments and organizations to implement evidence-based policies, deliver services, and ensure food safety, nutrition, environmental sustainability and market functioning. Examples of technical capacities in agrifood systems include expertise in agronomy, soil science, animal health, fisheries management, food safety standards, post-harvest technologies, agrifood processing and agribusiness.

In recent years, digital capacities have become a priority for agrifood. This includes the ability of actors to process and visualize the complex, multi-source data streams essential for agrifood systems planning, including satellite imagery, sensor feeds, real-time market prices and supply-chain traceability records. Public institutions also need the capacities to curate, integrate and analyse diverse datasets using cloud platforms and data visualization tools, so that they can monitor systems performance at fine spatial and temporal scales, detect emerging risks (e.g. pest outbreaks or cold chain logistics bottlenecks) and tailor interventions to local conditions.

Analytical-technical capacities required for a systems approach (*Systems Knowledge, Systems Thinking and Systems Learning*) refer to the capacities of policymakers to work in a cross-disciplinary manner across technical capacities – such as agronomy, engineering, behavioural science, sociology and data science – to address complex challenges that exceed the scope of any single field. These capacities enable integrated solutions, producing responses that range from farm-level extension services to food safety enforcement and cross-ministerial policymaking. They also include the public sector's capacities to understand feedback loops and recognize trade-offs from interventions in the system that may generate positive or negative impacts elsewhere.¹

Operational capacities

Operational capacities refer to the resources, structures and processes, including digital processes, necessary for policy implementation. These encompass functions such as project or programme management, partnerships, monitoring and evaluation, and resource management. Operational capacities also underpin organizational routines – the day-to-day activities that public institutions carry out to achieve their goals. These include tasks that help policymakers coordinate work across teams and departments, engage in partnerships and communicate with the public. Operational mechanisms can also include tools that embed monitoring, evaluation and learning into policies that can be adjusted in real time. In contrast, traditional monitoring and evaluation tools focus on *ex post* evaluation.

Operational capacities required for a systems approach (*Systems Governance* and *Systems Doing*) refer to government capacities to coordinate and operate horizontally and vertically across different governance levels – local, subnational, national, regional and global. These capacities enable policymakers to link, for instance, farm-level challenges with the pilot testing and national scaling of machine technologies. They can also be used to develop practical mechanisms such as memorandums of understanding (MoUs) with partners, performance frameworks that track targets across units, cross-departmental exchanges programmes and coordinated budgeting strategies.

Political capacities

Political capacities are skills that shape political dynamics, forge alliances and advocate for policy changes, including in activities like coalition-building, lobbying, negotiations and strategic communications. Political capacity also refers to the state's political autonomy – its ability to make decisions and take actions without being overly influenced by outside economic actors or interest groups. The government's capacity to manage financial resources, such as tax revenues, and its ability to attract private sector investment that aligns with its vision are also important capacities that contribute to political autonomy.

Political capacities required for a systems approach (*Systems Thinking* and *Systems Investing*) refers to leadership and convening skills that enable governments to gather diverse stakeholders, navigate conflicts and build coalitions (for more details see Module 3).¹⁶ It includes the capacities to work across sectoral agendas – agriculture, health, education, trade, environment and finance – and to translate technical knowledge into coherent, system-wide policies and programmes, at both regional and global levels. These types of capacities can influence how governments represent and advance their national interests, for instance when states come together to negotiate and adopt international food standards under the Codex Alimentarius Commission (CODEX).

In recent decades, the ability of governments to integrate sustainability and environmental sciences into policies at the national, regional and supranational level, has combined technical capacities (e.g. quantifying greenhouse gas emissions from farm to fork) with political capacities on global agendas.

Table 15. Characteristics and examples of analytical-technical, operational and political capacities

Core capacities for policymakers and public sector institutions	Core capacities for a systems approach	Capacities in action
Analytical and technical capacities: Support the generation and use of evidence across disciplines to improve understanding of system dynamics, assess trade-offs, and inform policy design and adaptation. Enable integrated analysis across sectors and scales, including the use of digital tools and data systems.	Systems Knowledge; Systems Thinking; Systems Learning: Integrating data, disciplines and knowledge systems to understand interdependencies and inform policymaking.	East Africa – Fall Armyworm response (2017–): A multi-country initiative addressing a transboundary agrifood threat through integrated approaches. Combines digital monitoring (including drone-supported interventions), agronomic research (ICRPE, CIMMYT), behavioural studies on farmer adoption, environmental and health assessments, and cost–benefit analysis to inform coordinated policy and investment decisions. ⁱⁱ
Operational capacities: Enable implementation across levels by translating strategies into coordinated action. Include systems for delivery, partnerships, monitoring and evaluation, and scaling of solutions across local, national and regional contexts.	Systems Doing; Systems Governance: Coordinating implementation across levels, embedding learning, and scaling solutions through partnerships and institutional mechanisms.	Benin – Songhai Centre: An agrifood incubator operating across local, national and regional levels, providing training for farmers and youth, aligning with national strategies, and scaling sustainable agriculture practices through partnerships with regional institutions (e.g. ECOWAS, WAAPP). ⁱⁱⁱ
Political capacities: Enable high-level leadership, alignment of policy objectives across sectors, and sustained coordination among diverse actors. Support the management of trade-offs and the integration of agrifood priorities across government.	Systems Governance; Systems investing; Systems Thinking: Convening actors, aligning interests, and managing trade-offs across sectors and levels of governance.	Zambia – Comprehensive Agriculture Transformation Support Programme (CATSP): A nationally coordinated programme aligning the agriculture, fisheries, livestock, environment, land and health sectors. Anchored at a high political level, CATSP links national coordination with localized value chain planning, and supports Zambia’s Food Systems Transformation Pathways. ⁱ
Integrated political, analytical and operational capacities: Combined application of these capacities enables coherent policy design, effective coordination and sustained implementation across the agrifood system.	Systems Knowledge; Systems Thinking; Systems Learning; Systems Governance; Systems Doing: Mobilizing complementary capacities to manage interdependencies and drive system-wide transformation.	Ireland – Food Vision 2030: A national agrifood systems strategy coordinated across government, research (Teagasc), industry and academia. Environmental performance is monitored through the Origin Green programme using carbon foot-printing and market intelligence. The strategy also invests in capacity development and engages actors across the value chain, from farmers to retailers, to support sustainable transformation. ^{iv}

Sources: See [Notes](#) at the end of the module.

Box 36 describes the adoption of the “Helical model”, which supports the integration of analytical-technical, operational and political capacities to enhance the development of capacities for agricultural innovation systems in tropical countries under the Tropical Agriculture Platform’s (TAP) Common Framework.

Box 36 Tropical Agriculture Platform (TAP)’s Common Framework: A systems approach to innovation and capacity development

The Tropical Agriculture Platform’s Common Framework is a multistakeholder partnership focused on building capacities for agrifood systems innovations in tropical regions. The Framework focuses on consolidating diverse capacity-building tools and approaches, and promoting mindset shifts. The Platform has adopted the “Helical model”, which describes several phases of development related to the introduction of innovation into the agrifood systems. With respect to innovations and capacity development, the model refers to a deceleration phase after rapid development, following the adoption of a successful innovation. This allows for policy adjustments, institutional changes and the acquisition of skills to ensure innovations align with evolving challenges.

Source: **FAO**. 2016. *Common Framework — The Tropical Agriculture Platform (TAP)*. Rome. www.fao.org/in-action/tropical-agriculture-platform/common-framework/en

Box 37 discusses the integration of these capacities at the national level in Brazil, describing the country’s experience in strengthening the capacities of its civil service.

Box 37 Building capacities in the Brazilian senior civil service system

Brazil is strengthening its civil service by enhancing skills, reassessing senior-level competencies and creating incentives that make the public sector a rewarding place to work. The goal is to build a capable and innovative civil service that meets citizens’ expectations and rebuilds trust in government. The OECD has outlined several steps that Brazil is undertaking to develop these capacities:

- **Understanding current capabilities.** An assessment of current capabilities has highlighted critical areas lacking in Brazil’s civil service. These include business acumen, innovation skills such as digital fluency, systems or design thinking, foresight and a commitment to continuous learning. These skills are underpinned by values like public service ethics, which ensure that these competencies are grounded in integrity and accountability.
- **Investing in skills development.** Brazil’s National School of Public Administration (ENAP) offers an “International Programme for Intersectoral Policies: Perspectives on Sovereignty Policies and Food and Nutrition Security”. The course is designed to equip public sector leaders with the tools to drive change in areas such as agrifood systems.
- **Aligning recruitment and innovation goals.** To match skills with job needs, Brazil could further develop a merit-based hiring approach that emphasizes innovation. By including innovation-oriented objectives in job profiles and performance reviews, Brazil can ensure that new hires bring skills that drive innovation.
- **Building a culture of innovation and leadership.** By promoting leadership skills, continuous learning and merit-based recruitment, Brazil serves as a model for other countries looking to tackle similar challenges across various sectors, including agrifood systems.

Sources: **WFP**. 2024. WFP Brazil director closes ENAP course on food and nutrition security. In: *The World Food Programme*. Rome. [Cited 5 September 2024]. <https://centrodeexcelencia.org.br/en/diretor-do-wfp-brasil-encerra-curso-da-enap-sobre-seguranca-alimentar-e-nutricional>; **OECD**. 2019. *Innovation skills and leadership in Brazil’s public sector: Towards a senior civil service system*. OECD Public Governance Reviews. Paris, OECD Publishing. <https://doi.org/10.1787/ef660e75-en>

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Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7
Understanding complexity	Tools for systems analysis	Policy and strategy development	Engaging multiple stakeholders	Policy innovations	Finance and investment	Building capacities

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Annex 1:

Guidance on sharing national-level indicators on agrifood systems

The figures presented here can be adapted to suit the specific needs of a country or region. For example, to track progress, or a lack thereof, over time, it may be useful to analyse changes in certain indicators using time series data. In such cases, line charts are effective for showing upward or downward trends, or even flat lines indicating no change. It is important to note that line charts require continuous time series data over the relevant period to accurately reflect these trends.

Trend data can also be compared with subregional, regional or global datasets to evaluate how a country is performing relative to others. Additionally, data can be compared with countries that have similar GDP, population or other characteristics, depending on the analytical needs.

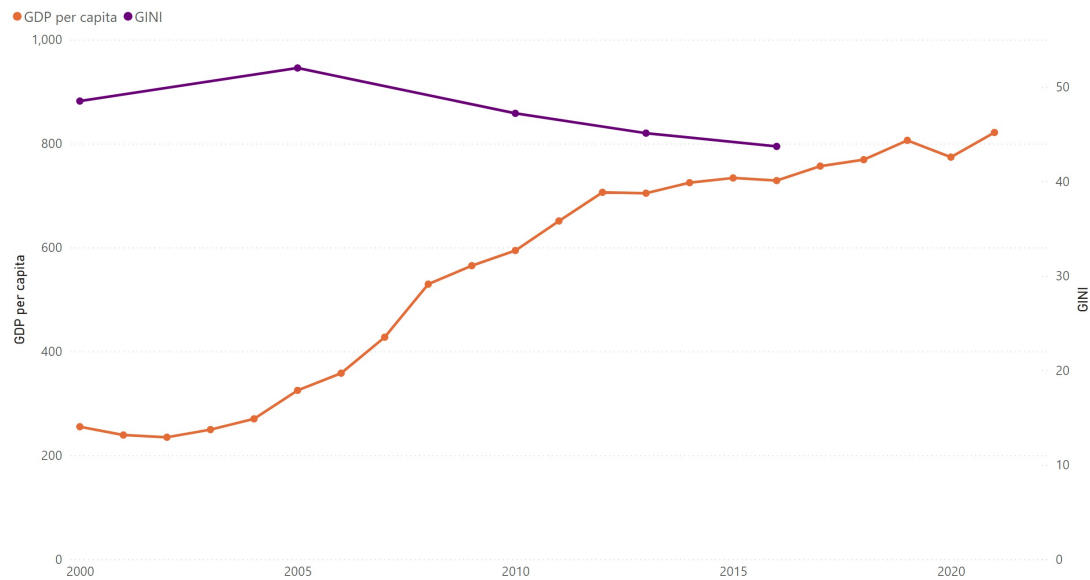
If long-term time series data is unavailable or contains gaps for multiple years, bar charts may be a better choice, as they clearly highlight missing data and allow for easier visualization of discrete data points. Similarly, to show the proportion of different sectors for a given indicator, pie charts or donut charts are useful because they provide an immediate visual overview of the share each sector contributes.

Furthermore, if geospatial data (i.e. data with geographic locations) are available, indicators can be mapped at different administrative levels. This allows for the creation of gradient maps that illustrate which areas are performing well and which are lagging behind.

Overall, these suggestions serve as guidelines. Graphs and charts can be adapted based on the available data and the specific needs of the analysis.

Figure A1 is a graph showing the change in GDP per capita and the GINI index (a measure of income inequality) between 2000 and 2020. While the relationship between GDP per capita and income inequality is not linear, the data provide an insight into the socioeconomic landscape of the country or the selected study area when adapted to the training needs. National indicators can also be compared with subregional, regional or global values to assess how the country compares.

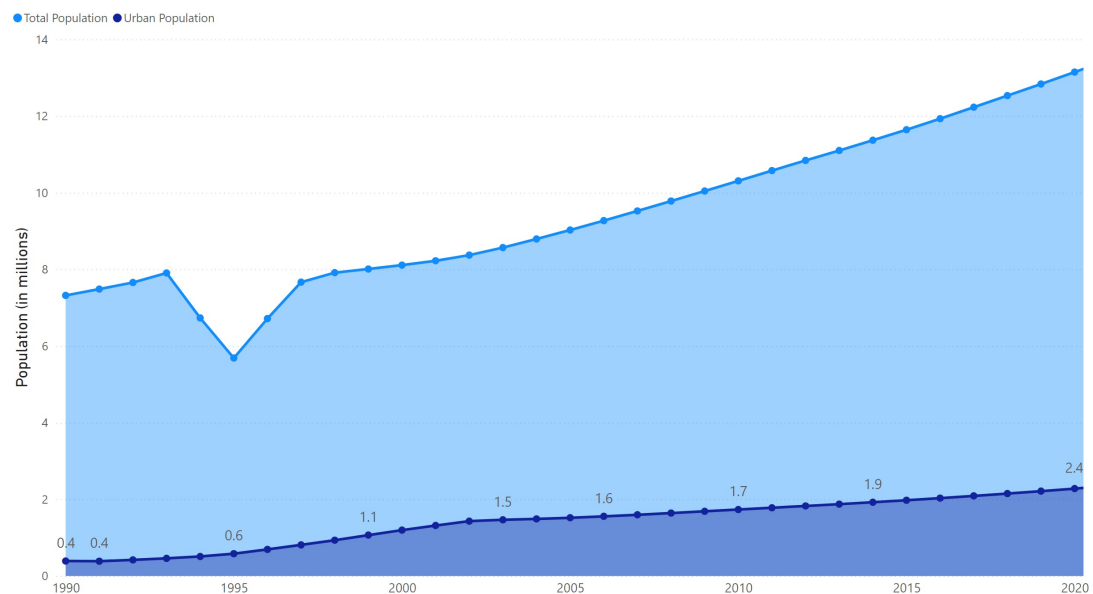
Figure A1. Rising income and persistent inequality in Rwanda



Source: **World Bank**. 2023. *World Development Indicators*. [Cited 15 September 2023]. <https://databank.worldbank.org/source/world-development-indicators>

Figure A2 is a graph illustrating total population growth alongside the increase in the urban population, highlighting the trend of rising urbanization. A comparison of these two indicators reveals that, although the total population declined between 1994 and 1997, urbanization continued to rise during that period. Such graphs help understand trends in population change at a glance.

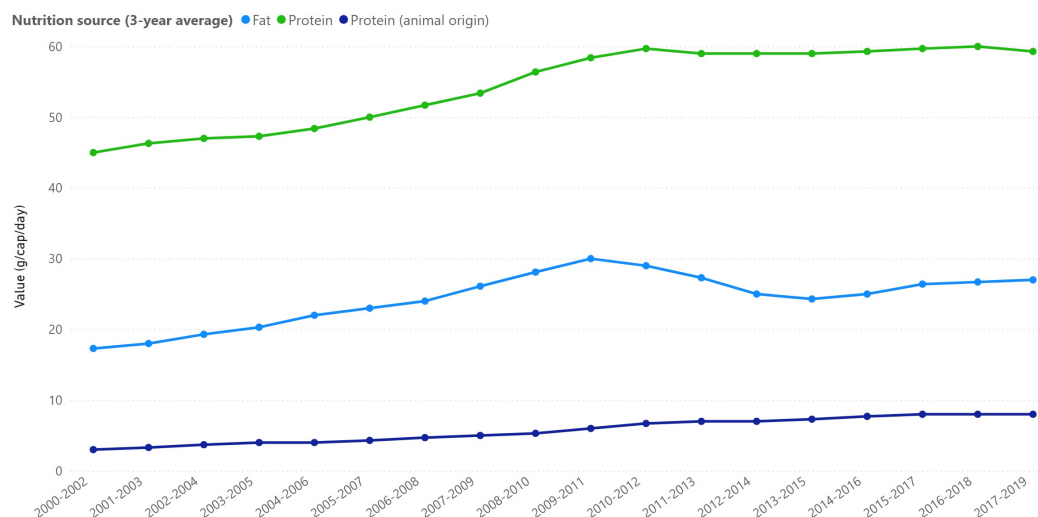
Figure A2. Population growth and urbanization in Rwanda



Source: **FAO**. 2023. *FAOSTAT: Annual Population*. [Cited 15 September 2023]. <https://www.fao.org/faostat/en/#data/OA>

Figure A3 is a line chart highlighting the changes in consumption patterns of three macronutrients – fat, protein and animal-based protein – over the years. The chart can be adapted to compare consumption patterns with respect to other macronutrients or diets, if data are available.

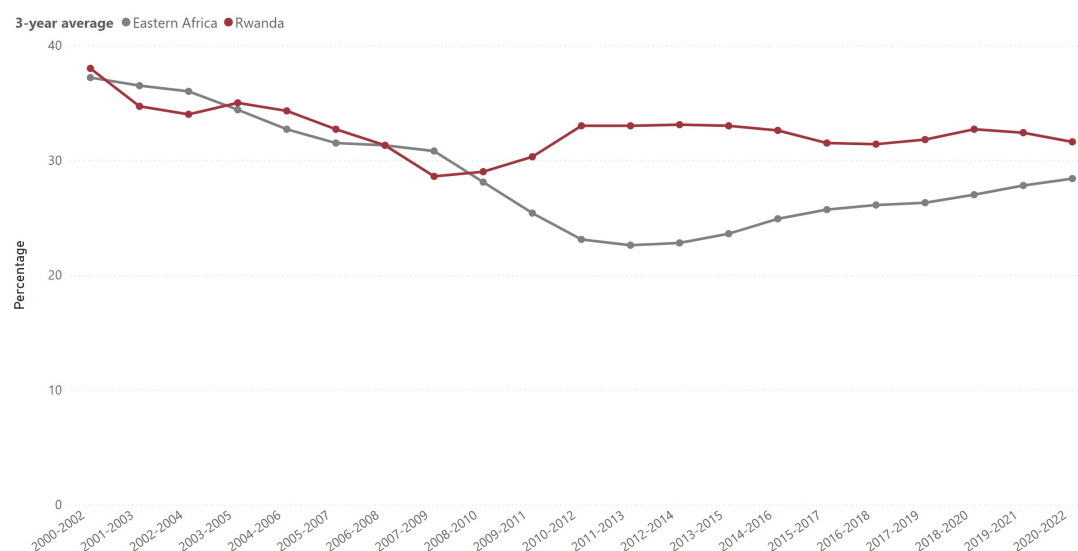
Figure A3. Changes in macronutrient consumption in Rwanda



Source: FAO. 2023. FAOSTAT: Food Security. [Cited 15 September 2023]. www.fao.org/faostat/en/#data/FS

Figure A4 presents a visual representation of the Prevalence of Undernourishment indicator, providing an overview of progress, or lack thereof, made in addressing undernourishment. This indicator is a key measure of SDG 2: Zero Hunger. In this case, national data are compared with the subregional average for Eastern Africa, to assess how well the country is progressing relative to its neighbours.

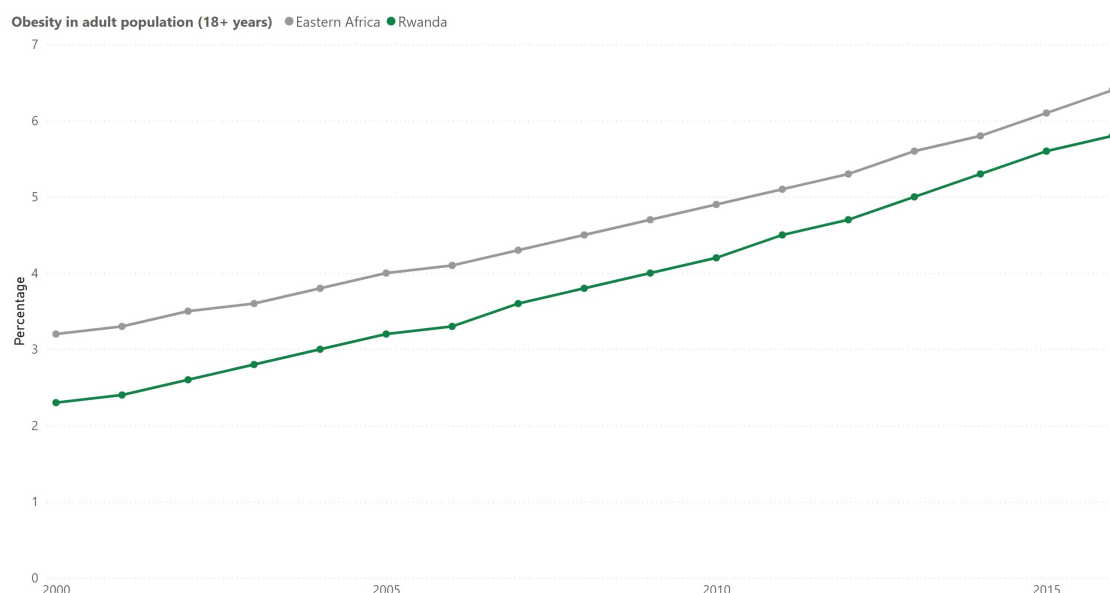
Figure A4. Prevalence of undernourishment in Rwanda and Eastern Africa



Source: FAO. 2023. FAOSTAT: Food Security. [Cited 15 September 2023]. www.fao.org/faostat/en/#data/FS

Similarly, Figure A5 uses a line graph to show trends in adult obesity in Rwanda and Eastern Africa using the Obesity in Adult Population indicator. Such comparisons can help users understand national trends in relation to subregional patterns and can be expanded by adding regional or global data.

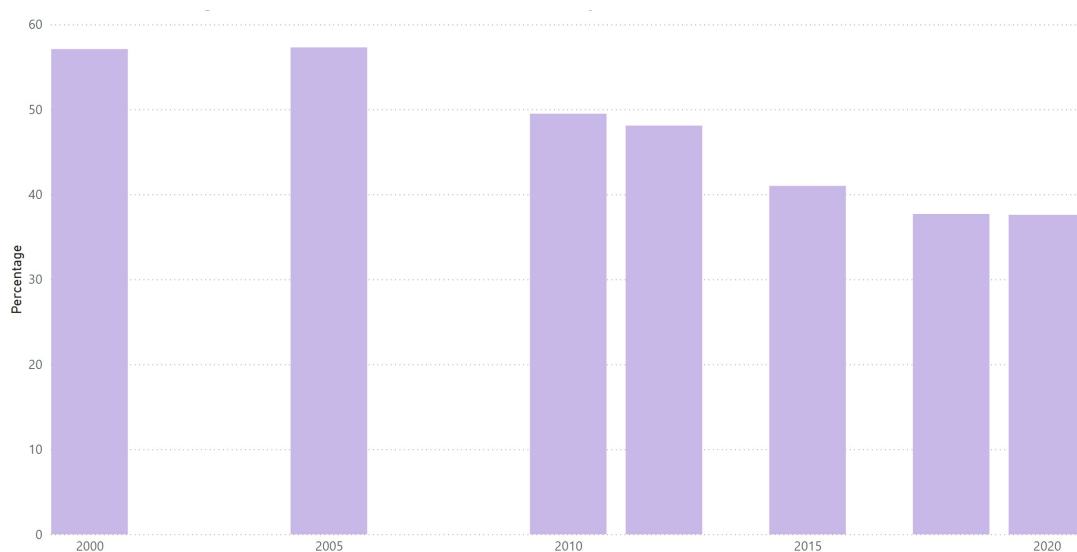
Figure A5. Obesity in adult population in Rwanda and Eastern Africa



Source: FAO. 2023. FAOSTAT: Food Security. [Cited 15 September 2023]. www.fao.org/faostat/en/#data/FS

Figure A6 presents a bar chart depicting child nutrition in Rwanda, based on the indicators of wasting, overweight and stunting in children under 5 years of age. This format was chosen because data for some years are missing and not continuous. The visualization makes these gaps clear, helping to highlight the missing data and their impact on tracking progress.

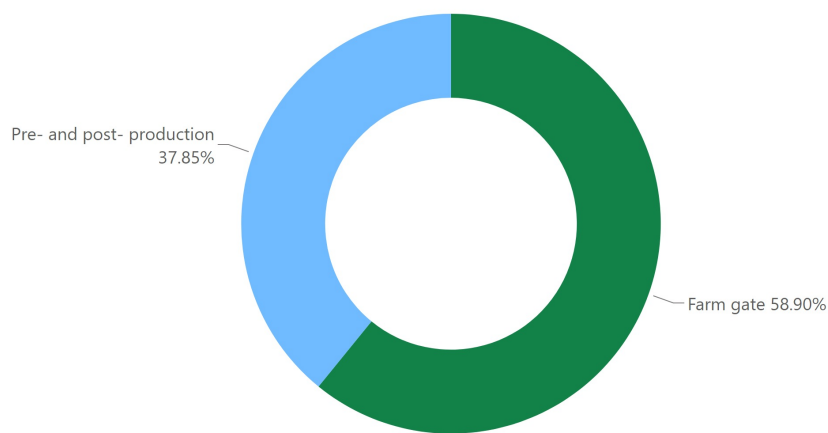
Figure A6. Wasting, overweight and stunting among children under 5 years of age in Rwanda



Source: FAO. 2023. FAOSTAT: Food Security. [Cited 15 September 2023]. www.fao.org/faostat/en/#data/FS

Figure A7 presents a donut chart clearly showing the share of emissions by sector within agrifood systems, enabling easy comparison of proportions. The two components highlight how the total is divided, while the open centre keeps the design clean and can be used to display key figures or labels.

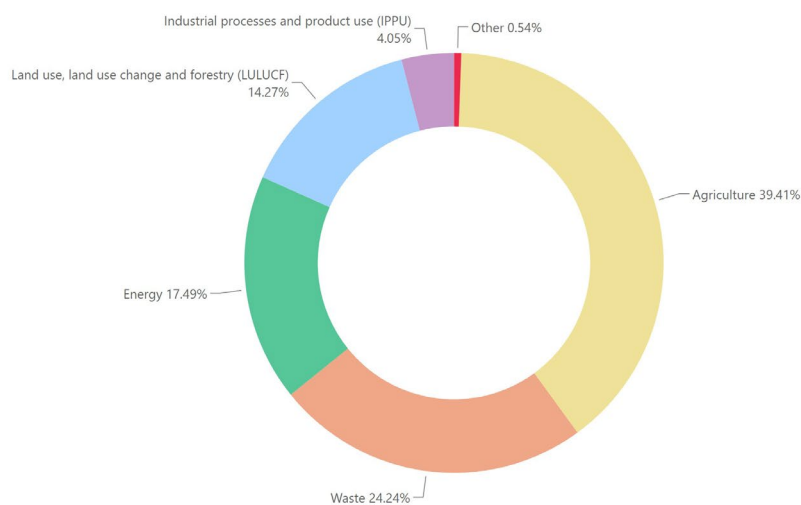
Figure A7. Share of agrifood systems emissions by component, CO₂ equivalent, AR5, Rwanda



Source: FAO. 2023. FAOSTAT: Emissions. [Cited 15 September 2023]. <https://www.fao.org/faostat/en/#data/GT>

Using visual representations such as donut charts (or pie charts) provides a clear view of the proportion of emissions from different sectors, offering clear information at a glance. Figure A8 provides an example of this type of chart, which shows that agriculture accounts for the largest share of emissions.

Figure A8. Share of emissions across all sectors, CO₂ equivalent, AR5, Rwanda



Source: FAO. 2023. FAOSTAT: Emissions. [Cited 15 September 2023]. <https://www.fao.org/faostat/en/#data/GT>

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