FOOD FORWARD NDCs

Assessing food system impacts

Overview

The **interlinked negative impacts of food systems** are often overlooked in policymaking. These linked consequences include land, water and ecosystem degradation; greenhouse gas emissions; biodiversity losses; hunger, micro-nutrient deficiencies, obesity and diet-related diseases; and enduring livelihood stresses faced by farmers worldwide.

Policymakers often miss out on the opportunity to design interventions that simultaneously address multiple issues related to food systems equity and sustainability. To do this, policymakers need a thorough understanding of costs and benefits for all stakeholders within the agri-food system, including under-represented groups and future generations. Such an understanding would foster investment and policy actions – including fiscal support, regulations and voluntary standards – that prioritize nutrition, gender equality and environmental sustainability.

True cost accounting (TCA) is a powerful method for uncovering the hidden costs of agri-food systems. TCA is a holistic and systemic approach to measure and value the environmental, social, health and economic costs and benefits generated by agri-food systems to facilitate improved decision making by policymakers, businesses, farmers, investors and consumers. However, TCA is a broad concept that can be applied in many diverging ways. TCA methods change depending on a country's resources, data availability, capacity and reporting systems, which presents a notable challenge, particularly for low- and middle-income nations.

Concrete measures to implement

Several methodologies, frameworks and tools are currently available to provide a basis to food system governance and inform holistic policymaking. For example, FAO proposes a two-phase assessment using TCA to help decision-makers understand current and future agri-food systems and intervention areas to improve their sustainability:

- **Phase 1: Initial national-level assessment to quantify and analyse the impacts and hidden costs of agri-food systems.** The main purpose of the initial phase is to create awareness regarding the significant challenges associated with national agri-food systems. Its goal is to connect these hidden costs to critical national priorities, such as reducing hunger or conserving limited natural resources. Additionally, it feeds discussions and dialogues with stakeholders in the corresponding country. Although it provides only a partial picture, this stocktaking exercise is a crucial starting point for addressing some of the most important challenges in national agri-food systems.
- **Phase 2: In-depth targeted assessments of specific components, value chains or sectors of agri-food systems.** The objective of this phase is to guide policy actions and investments in a specific country. The targets can be defined based on the results of the first phase or guided by country priorities per consultations with relevant stakeholders. To create a focused assessment, it is crucial to define the scope of the analysis effectively, ensuring it remains manageable while meeting its objectives. This begins by selecting the functional unit of analysis, which determines what will be assessed and measured (e.g., agri-food systems, dietary patterns, investment, organization and product). The targeted assessment process is organized into four steps:

    1. *Frame the issues*: Step one involves reviewing the results of the initial national-level assessments from Phase 1. This helps to identify and target the key sustainability issues.
    2. *Document and analyse available data*: Step two focuses on collecting and analysing available national- or subnational-level data on the key sustainability issues to complement the Phase 1 estimates. Data can be sources from international institutions, such as the Institute for Health Metrics and Evaluation (IHME), FAO, the World Health Organization (WHO) and the World Bank, or from local entities such

as ministries of agriculture, environment and health. Due to the diversity of agri-food systems and their contexts within countries, the national scale may be imperfect as an analytical unit for effective actions. Thus, depending on data and resource availability, national-level data should be complemented by spatial analyses, which will enable the heterogeneity of the main impacts and drivers of agri-food systems to be captured at the subnational level.

3. *Assess levers*: Step three identifies potential levers to address the key sustainability issues related to agri-food systems. Levers can affect the supply side (i.e., production and intermediaries), the demand side (i.e., food consumption), and public goods supporting agri-food systems (i.e., general services). After gathering and analysing data on the cost of different levers and estimating their benefits, levers can be compared, for example, by using cost-benefit or cost-effectiveness analyses. Then, decisions can be made about which levers to employ. For this to be effective, the process should be inclusive and allow for dialogue and collaboration among all agri-food systems stakeholders, including policymakers, private-sector entities and local authorities.
4. *Employ levers and scale TCA*: Step four involves two parallel, but linked, processes: (i) implementing and promoting levers to reform policies, investments and other interventions to address the concerns identified in the previous steps, and (ii) scaling up targeted TCA assessments to enable the monitoring of reforms and the expansion of TCA assessments to new areas of concern. The targeted assessment process is cyclical, whereby the scaling of TCA should not be viewed as the final objective, but rather the start of a new cycle of measurement and evaluation to ensure continuous positive results.

Enabling governance measures

- Encourage agricultural sector actors to **improve transparency** around the true costs (i.e., **externalities**) of food production and supply chains.
- Integrate food system assessments into educational systems and into the training of government professionals, including the provision of concrete tools/skills for conducting assessments.
- Establish cross-departmental government bodies to evaluate and implement food system policies. Food systems span across many different

agencies, departments and ministries. Cross-departmental bodies can facilitate collaboration between them.

- Establish requirements for all government agencies/departments to **assess non-market costs** associated with policies and programmes.
- Integrate use of information from assessments into **product labelling** requirements. For more information on possible agri-food product labelling measures, see ***Regulating advertising of unhealthy and unsustainable food***.
- Applying integrated landscape thinking to foster partnerships through novel initiatives, such as urban-rural cooperation or environmental organisations and farmer-learning networks. See ***Developing and improving agriculture in urban and peri-urban areas and enhancing local food markets***.
- Promote peer-to-peer action research through participatory and practical applications.

Tools and MRV systems to monitor progress

FAO System of Environmental Economic Accounting for Agriculture, Forestry, and Fisheries (SEEA-AFF)

A statistical system to organize data and describe and analyse the relationship between the environment and activites in agriculture, forestry and fisheries. It assists with measurement and reporting on monetary and physical assets and flows related to production, trade and consumption of food and other products, as well as natural resource use.

Link: https://seea.un.org/content/system-environmental-economic-accounting-agriculture-forestry-and-fisheries

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Mitigation benefits

The integration of food system assessments into government agency training, planning and general operation can result in:

- Increased awareness and consideration of the costs and impacts of government operations and policies on food systems.
- Public policy shifts towards supporting sustainable, equitable and transformative agri-food solutions.

- Food system assessments help identify climate impacts of food systems and opportunities to reduce associated GHG emissions.

Other environmental benefits

If the application of food system assessments leads to shifting public policies towards sustainable and transformative agri-food solutions, they can ultimately contribute to climate benefits beyond climate change mitigation, potentially including:

- Reduced emissions from reduced land use change and land degradation.
- Potentially reduced use of water, energy and other agricultural inputs due to reduced production of low-sustainability foods.
    - Reduced risk of **eutrophication**. Eutrophication is the process by which aquatic systems become over-enriched with nutrients such as nitrogen and phosphorus due to the run-off of agricultural inputs (e.g., fertilisers into water systems). There are several types of emissions associated with eutrophication, including air pollution (e.g., sulphur dioxide and nitrogen oxides) and water pollution (e.g., nitrates, ammonium, nitrogen and phosphorus).
    - Reduced **acidification** due to reduced inputs associated with agricultural production (e.g., fertilisers and pesticides). Types of emissions associated with acidification include sulphur dioxide, ammonia and nitrous oxides.
    - Improvements in soil health.
    - Reduced use of fertilisers and fossil energy sources improves air quality.

Adaptation benefits

Adaptation benefits linked to a potential paradigm shift informed by integrating food system assessments can bring multiple adaptation benefits. Please see **other policy options in this tool**.

Other sustainable development benefits

- Food systems are relevant to all SDGs and are at the heart of at least twelve of the seventeen SDGs.

Main implementation challenges

- Lack of reliable, complete data can lead to large uncertainties and unreliable results.
- Lack of scientific consensus on food system issues or processes.
- Difficulty in striking a balance between overly simplistic models, which do not properly capture real-world processes or place-based information, and overly detailed/localised models, which can be difficult to interpret and impractical for generating concrete, broadly applicable policy outputs.
- Lack of capacity, funds and/or time.

Measures to minimize challenges

- Uncertainties due to lack of data, scientific consensus or other factors can be reframed in terms of confidence levels or possible risks, based on expert judgement. For example, the IPCC's methodology provides confidence levels to statements based on levels of robustness and scientific agreement. Furthermore, uncertainty can be addressed by comparing results across different assessments and assessment methodologies/tools to reach more robust conclusions.
- Models should use an appropriate level of complexity and be transparent about their scope, boundaries and limitations. The appropriate level of complexity may vary according to the problem being addressed and the data available.
- Establish partnerships, particularly between institutions in low-income countries and those in high-income countries, to build the capacity and expertise necessary to conduct assessments and implement the resulting policy recommendations.
- Some aspects of assessments, such as expert interviews and stakeholder engagement, can be conducted virtually to save time and money. In these

cases, it is important to conduct proper online facilitation which ensures all participants can properly engage and voice their ideas.

Potential negative externalities and trade-offs

Not found.

Measures to address potential negative externalities and trade-offs

Not found.

Implementation costs

- There are no publicly available estimates of the cost of applying the different food system assessment methods and tools.

Intervention in practice

- TEEBAgrifood provides past and ongoing **case study examples** of implementation for the evaluation framework in several countries. Several countries have used this framework to apply TCA and develop better agricultural land-use policies. For example:
    - The Ministry of Environment & Forestry and the Ministry of Agriculture, Livestock & Fisheries in **Kenya** used the framework to conduct an assessment of the environmental, social and economic impacts along the value chain of the traditional use of forests and food systems in the Greater Mau Catchment Area. The assessment will inform policies such as the country's 2030 Agenda by providing quantitative evidence on the biodiversity and ecosystem services of the area and the potential benefits of adopting different scenarios over the business-as-usual scenario.
    - The Ministry of National Development Planning (BAPPENAS) in **Indonesia** oversaw a TCA to inform its cocoa agroforestry policy and strengthen its policies overall to internalise natural capital costs and

benefits. The interim findings contributed to the inclusion of agroforestry in Indonesia's National Development Plan.

- The iFEED methodology has been applied to generate country-level **policy advice** and future scenarios for four countries (Zambia, South Africa, Malawi and Tanzania).

References

1. Chaudhary, A., Gustafson, D., & Mathys, A. (2018). Multi-indicator sustainability assessment of global food systems. *Nature Communications*, *9*(1), 1–13
2. Country Implementation. (n.d.). *The Economics of Ecosystems and Biodiversity*. Retrieved February 14, 2024, from https://teebweb.org/our-work/agrifood/country-implementation/
3. Hendriks, S., de Groot Ruiz, A., Acosta, M. H., Baumers, H., Galgani, P., Mason-D'Croz, D., et al. (2023). The True Cost of Food: A Preliminary Assessment. In *Science and Innovations for Food Systems Transformation* (pp. 581–601). Retrieved February 14, 2024, from https://link.springer.com/chapter/10.1007/978-3-031-15703-5_32
4. iFEED Results. (n.d.). Retrieved February 14, 2024, from https://ifeed.leeds.ac.uk/countries.
5. Indonesia. (n.d.). *The Economics of Ecosystems and Biodiversity*. Retrieved February 14, 2024, from https://teebweb.org/our-work/agrifood/country-implementation/eupi2019/indonesia/
6. Sustainable Food Trust. (2019). *The Hidden Cost of UK Food*. Retrieved from https://sustainablefoodtrust.org/wp-content/uploads/2022/01/Website-Version-The-Hidden-Cost-of-UK-Food_compressed.pdf
7. *The State of Food and Agriculture 2023*. (2023). Retrieved February 14, 2024, from https://www.fao.org/documents/card/en/c/cc7724en
8. Traditional use of forests and food systems in the Greater Mau Catchment Area, Kenya. (n.d.). *The Economics of Ecosystems and Biodiversity*. Retrieved February 14, 2024, from https://teebweb.org/our-work/agrifood/country-implementation/iki2017/kenya/
9. WWF UK. (2021). *Driven to waste: The Global Impact of Food Loss and Waste on Farms*. Retrieved from https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/6yoepbekgh_w