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Climate | Covid-19 | Conflict | Cost of Externalties

Report 5

Changing the Equation: Leveraging True Cost Accounting to Accelerate

Agri-Food Systems Transformation

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Acronyms

CBA	Cost-Benefit Analysis
CDP	Carbon Disclosure Project
CSR	Corporate Social Responsibility
CSRD	Corporate Sustainability Reporting Directive
EBIT	Earnings Before Interest and Taxes
ESG	Environmental, Social and Governance
ESRS	European Sustainability Reporting Standards
FAO	United Nations' Food and Agriculture Organization
GDP	Gross Domestic Product
IFRSF	International Financial Reporting Standards Foundation
ISSB	International Sustainability Standards Board
LCA	Life Cycle Assessment
NCD	Non-Communicable Diseases
PES	Payments for Ecosystem Services
ROE	Return On Equity
SDG	Sustainable Development Goals
SEBIT	Sustainable Earnings Before Interest and Taxes
SEEA	System of Environmental-Economic Accounting
SNA	System of National Accounts
SOFA	State of Food and Agriculture Report
SPA	Sustainable Performance Accounting
TCA	True Cost Accounting
TEEB	The Economics of Ecosystems and Biodiversity
WTO	World Trade Organization

Market from above
© graphic node on unsplash

Foreword

» When profits come at the expense of people and our planet, we are left with an incomplete picture of the true cost of economic growth. «

United Nations Secretary-General Antonio Guterres

In the lead-up to the 2024 Summit of the Future, the United Nations Secretary-General initiated a process that encourages Member States to move beyond Gross Domestic Product (GDP) as the standard measure for value creation, wealth, and development. Despite its undoubted impact as "the most powerful statistical figure in human history"[1], GDP fails to account for factors, including human well-being, environmental degradation, and unpaid work such as caring in families. In the same way that GDP offers only a limited view of economic performance, other common metrics such as productivity per hectare, earnings before interest and taxes (EBIT), and net profit margin also tend to obscure the true impacts of economic activities on natural, social and human capital, creating a distorted picture that exaggerates success and downplays damage. Current accounting systems – and therefore economic decision-making of all kinds – do not accurately reflect the positive and negative effects of economic activities.

The interconnected global crises related to climate, biodiversity and global health are intensifying as we continue to ignore many of the environmental, social, and health costs linked to our economic activities. According to the United Nations' Food and Agriculture Organization (FAO), agriculture and food systems are responsible for at least USD 10 trillion in hidden costs annually. This exceeds their contribution to global GDP, which means that agri-food systems destroy more value than they create. There is, therefore, an urgent need for a shift towards more sustainable approaches. The Food System Economics Commission estimates the net benefits of transforming food systems at USD 5 to 10 trillion per year.

The four previous reports in this series looked at how agri-food systems both contribute to and are impacted by the climate, biodiversity and global health crises. This report examines one of the drivers of those crises: economic systems that privatize profits but socialize costs. It also argues that the existing economic system – from accounting systems to macroeconomic planning and patterns of consumption – is blocking the transformation of food systems. If we are to meet agreed international goals such as the Sustainable Development Goals (SDGs), the climate goals of the Paris Agreement, and the Global Biodiversity Framework, we must build an economic system that supports rather than impedes sustainability.

This report presents True Cost Accounting (TCA) as a key enabling factor in the transformation of agri-food systems. By factoring in hidden costs and benefits, TCA reveals the actual economic, environmental and social impacts of policy, investment and business decisions and allows for more complete financial and policy analyses. In this way, TCA helps us to place value on natural, human and social capital and to consider not just immediate financial gains but also the long-term impacts on the planet and future generations. If TCA were adopted and implemented, it could create an economic framework that would promote sustainable agri-food systems, reward environmental stewardship, and contribute to human and environmental health. In order to rectify the problems inherent both in agri-food systems and the broader economy, we must first illuminate and understand the true costs of doing business.

This report shows how TCA can inform decision-making and support economic reform. It illustrates how TCA can be applied at different levels, from local initiatives to global transformation strategies, and by all stakeholders in agri-food systems. It does not aim to provide definitive solutions to the problems associated with agri-food systems but argues instead that changing the system of economic accounting is a prerequisite for a transition to sustainability. TCA is not a silver bullet; it cannot overcome all shortcomings of the economic system and should not replace laws, regulations, and incentives. However, its core concept of accounting for the hidden costs of economic activity is a first step towards managing and reducing them.

Women paying at a market in the Andaman and Nicobar Islands, India
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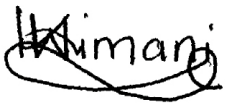

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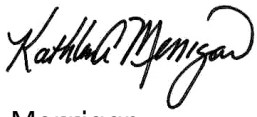

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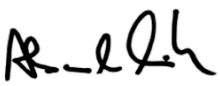

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Key messages

1 ‘Cheap’ food often comes at a high price: environmental damage, poor health, and low incomes for small-scale farmers. While large corporations profit, smallholder farmers, agri-food workers, consumers and society as a whole bear the true costs – especially vulnerable groups, for whom it can mean deepening poverty and eroding food sovereignty.

2 Agri-food systems generate substantial external costs (so-called externalities) by harming the environment and human health. According to FAO, these costs amount to at least 10 trillion US dollars per year, exceeding the contribution of food systems to global GDP.[2]

3 These externalities are currently ‘invisible’ because our system of economic accounting does not consider impacts on nature and human well-being. Yet these costs are real and will be borne by society as a whole and by future generations.

4 Externalities are a direct cause of the global climate, biodiversity and human health crises. Ignoring them incentivizes unsustainable business practices.

5 The current system of economic accounting favours unsustainable development pathways, distorts markets and puts sustainable businesses at a disadvantage, thereby hindering the transformation to sustainable agri-food systems.

6 True Cost Accounting (TCA) is designed to identify and measure the hidden costs and benefits of economic systems, including agri-food systems. It can be used to develop measures that accelerate the transformation of agri-food systems to sustainable models.

7 By assessing the environmental, social, health and economic costs, benefits, and risks of economic activities, TCA helps policymakers, businesses, farmers, investors, and consumers make better and more informed decisions that support long-term sustainability and well-being.

8 TCA can be used to address market distortions by integrating sustainability costs and benefits into traditional accounting. In doing so, sustainability becomes part of the equation, incentivizing sustainable practices and promoting human and planetary well-being.

9 To realise the full potential of TCA, it needs to be integrated into national and international policy frameworks, performance evaluation processes, accounting standards and regulatory policies, thereby becoming an enabling factor in the transformation to sustainability.

10 The aim of TCA is not to raise the market price of food but to inform policy reforms such as repurposing of subsidies and strategies for sustainable finance, social equity, sustainable livelihoods, and poverty alleviation and to develop more socially just agri-food systems.

Coffee farmer in Ciremai mountain, West Java, Indonesia
© rudi_suardi

Executive summary

The global agri-food system, from field to fork, is failing to nourish billions of people properly, is responsible for nearly a third of all greenhouse gas emissions and is a major driver of biodiversity loss. As it currently operates, this system imposes significant hidden costs on the environment, on the workers who produce 'cheap' food in dangerous or precarious conditions, consumers, and society as a whole. These hidden costs, or 'externalities', include water pollution remediation, social support for underpaid workers, and public health costs related to diet-related diseases, none of which are captured by traditional economic metrics. Externalities are prevalent in all sectors of the economy, not just agri-food systems, and are systematically ignored in conventional accounting and reporting systems. This omission leads to distorted market signals that encourage unsustainable business practices, the consequences of which are borne by society, particularly disadvantaged communities, and will weigh heavily on future generations while the polluters reap financial rewards. Addressing externalities is therefore essential to building an economic system that supports sustainable development.

This report introduces True Cost Accounting (TCA) as a comprehensive framework for assessing the hidden costs and benefits of agri-food systems. TCA represents a paradigm shift towards holistic decision-making, incorporating the full range of externalities beyond traditional economic measures. TCA is an essential approach for driving the transition to sustainability by addressing the externalities that contribute to today's multiple, interconnected crises.

The report outlines specific entry points for integrating TCA into decision-making by various stakeholder groups, including policymakers, investors, businesses, and consumers. These entry points include measures such as subsidies for organic farming and sustainable practices, taxes on harmful activities, the establishment of minimum standards for sustainable procurement, and mandatory reporting of externalities. Additionally, this report demonstrates how TCA can complement existing economic performance and accounting methods, providing a more complete assessment of business and economic success by considering all costs and benefits.

TCA can be used in a variety of ways. It can raise awareness of externalities and create the necessary support for the transition to sustainability, but it can also help develop regulations to correct market distortions caused by externalities. We must create an economic system that promotes sustainable production and consumption to overcome the planet's multiple crises and ensure a sustainable future for humanity.

Factory in Bergamo, Italy
© Arno Senoner on unsplash

1 The hidden costs of agri-food systems

The purpose of our global agri-food system is to feed people and provide livelihoods for those who work within it. However, it fails to fulfil the human right to adequate food for all and severely impacts the environment and human health. The agri-food system contributes significantly to biodiversity loss, climate change, and various forms of environmental degradation, while also fuelling the rise of non-communicable diseases (NCDs), micronutrient deficiencies, and obesity due to unhealthy diets.[3] These adverse effects, which occur throughout the food value chain, result in costs that are typically externalized. In other words, the costs are not borne by the producer or consumer but by society as a whole and disproportionately by specific communities and future generations.

The global environmental, social and health impacts of agri-food systems

When analysing the broader impact of producing a hamburger, for instance, it becomes evident that its 'true costs' extends far beyond the initial purchase price. Hidden costs include societal impacts such as remedying water pollution, providing social assistance to underpaid workers, and public health expenses due to diseases caused by unhealthy diets. Despite the apparent affordability of the hamburger, its real cost is much higher.[4] The price of our food is estimated to cover, on average, only about one-third of the actual costs incurred if social, environmental and health costs to society are included.[5]

Hidden costs of agri-food systems exceed their global market value

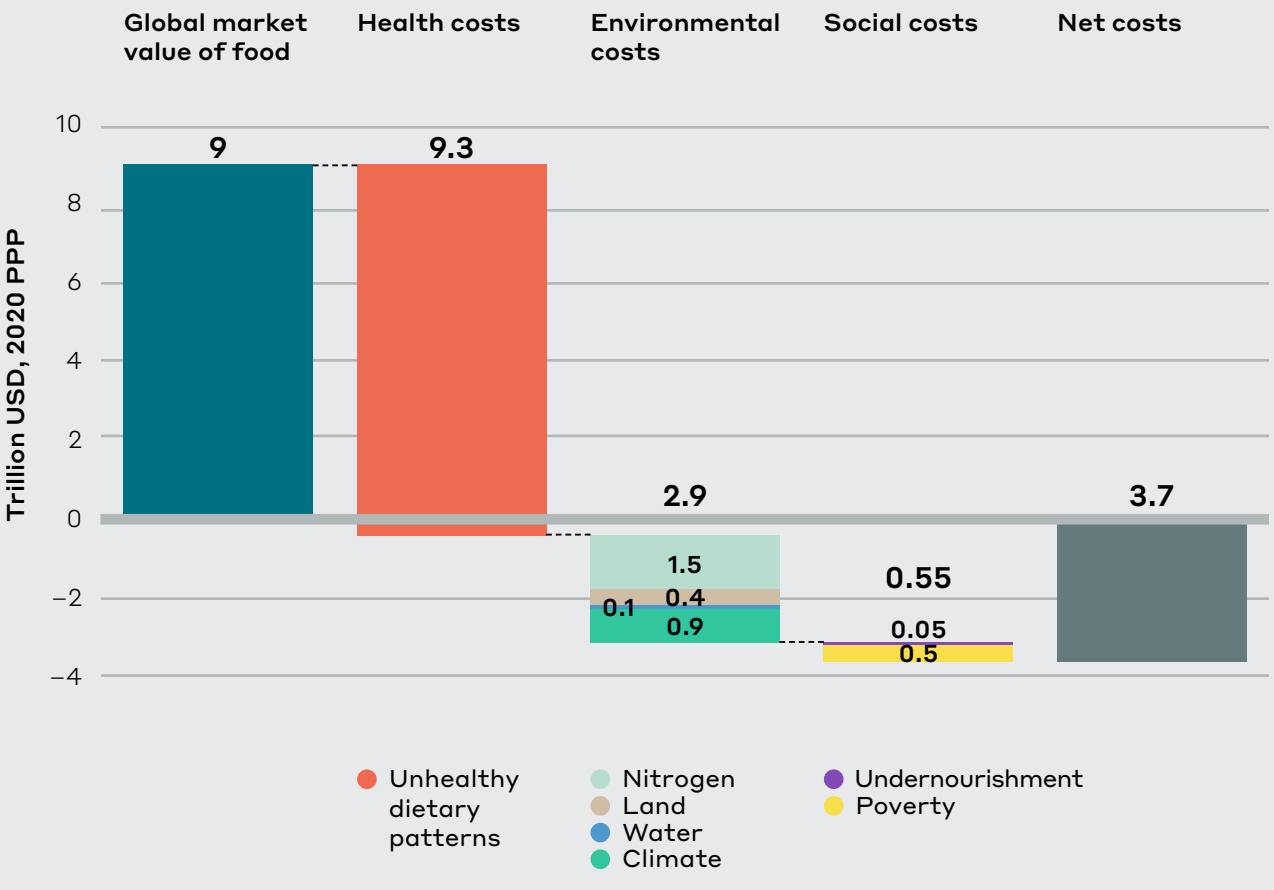


Figure 1: Hidden costs of the global food system (own illustration based on SOFA 2023)

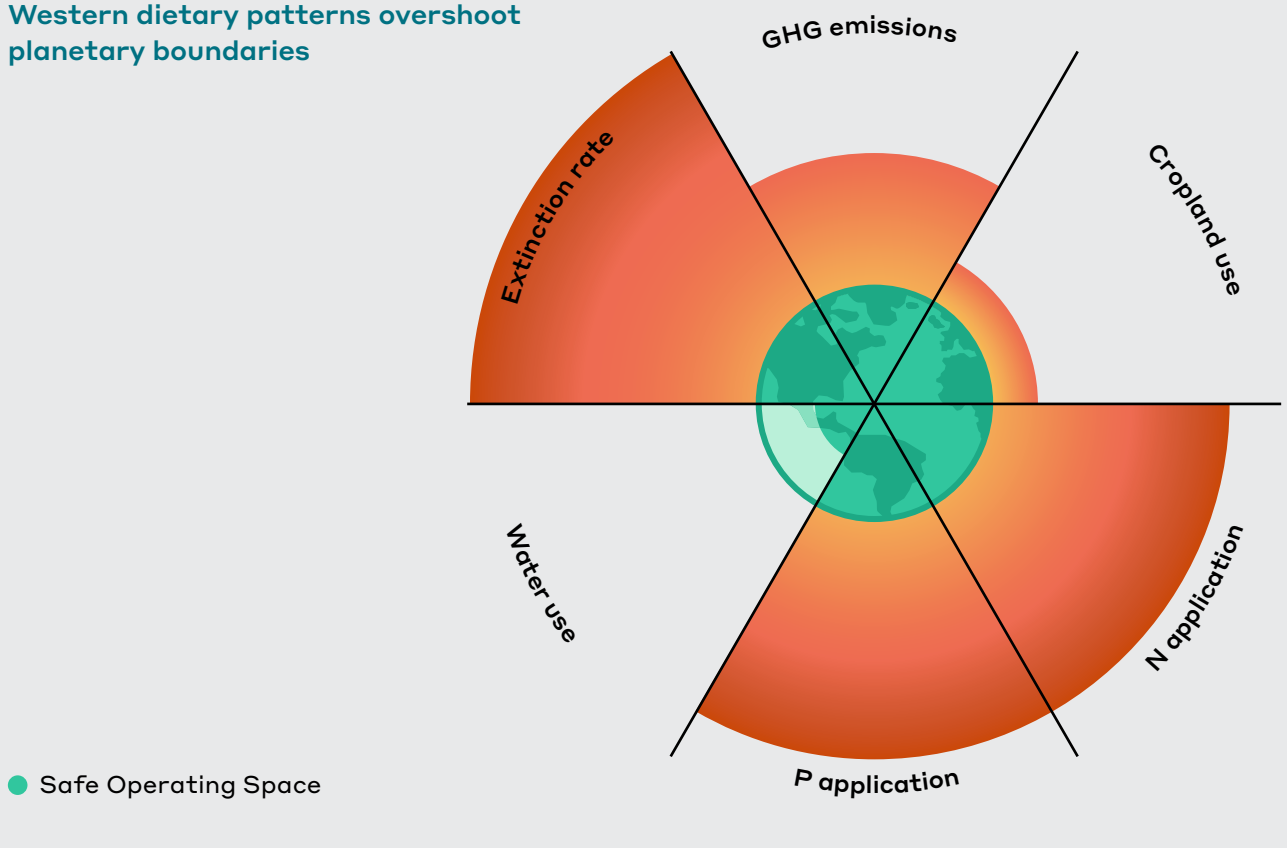


Figure 2: Performance of the Swedish diet along the planetary boundaries according to Moberg et al. (2020)

Numerous attempts have been made to measure the hidden costs associated with agri-food systems globally.[6] The State of Food and Agriculture Report (SOFA) 2023 by FAO covers 154 countries and offers a comprehensive national-level estimation of hidden costs. The calculations reveal that these global costs amount to at least 10 trillion dollars every year[2], more than food systems contribute to global gross domestic product (GDP).[3] This means our agri-food systems are destroying more value than they create.[8]

The 2023 SOFA report reveals that the largest share of hidden costs (more than 70%, or USD 9.3 trillion) comes from unhealthy diets, especially containing ultra-processed foods, fats and sugars, which cause obesity and non-communicable diseases such as cardiovascular disease, diabetes, and cancer. These costs are measured in terms of soaring healthcare spending and losses in labour productivity. Unhealthy diets are thus a major contributor to the deterioration of public health that is draining public finances, especially in resource-poor communities.

Environmental factors account for about one-fifth of all hidden costs, including excessive greenhouse gas and nitrogen emissions, land-use change, and water use. According to the FAO, these costs, projected at nearly USD 2.9 trillion annually, are likely underestimated. Dietary patterns in the Global North, for example, entail a significant overshooting of planetary boundaries, causing extensive damage that future generations will have to address. Figure 2, based on Moberg et al. (2020), illustrates the environmental impact of the typical Swedish diet relative to the boundaries set by the EAT-Lancet framework.[9] It shows that all boundaries, except those for water use, were exceeded, with biodiversity loss exceeding the limit sixfold. This highlights the substantial gap between the market price of the food we consume and its true cost in terms of damage to people and the planet.

Hidden social costs from poverty and undernourishment are more pronounced in low and lower-middle-income countries, accounting for an average of 50% of all quantified hidden costs in low-income countries and 12% in lower-middle-income countries.[2]

Who pays the price?

The SOFA report shows that agricultural systems have significant impacts and associated costs in all countries. However, those countries that are least responsible for these hidden costs, and their weaker socioeconomic groups, are disproportionately affected. Upper-middle-income countries account for 39% of total quantified hidden costs, high-income countries for 36%, and low-income countries for only 3%. But when hidden costs are expressed as a percentage of GDP, low-income countries bear the highest burden: in these countries, the hidden costs of agri-food systems amount to more than a quarter of GDP, compared to less than 12% in middle-income countries and less than 8% in high-income countries. This disproportionate impact highlights how our economic systems fail to take account of externalities, thereby exacerbating inequalities. Climate injustice is an example of this, as those who have contributed least to the climate crisis are often those who pay the highest price.

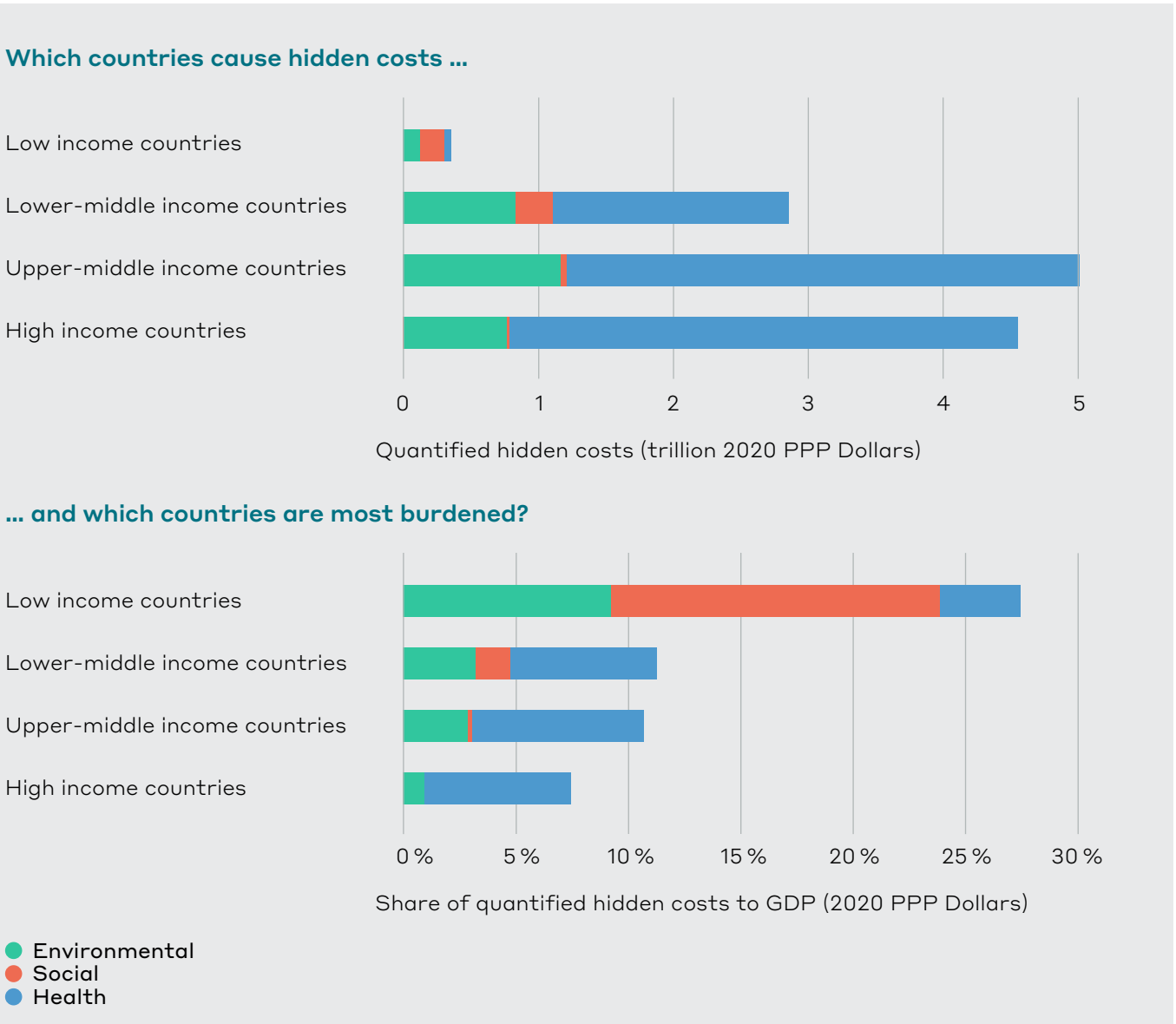


Figure 3: The total hidden costs of agrifood systems and their share of GDP by country categories (SOFA 2023)

Key drivers of the polycrisis and pathways to co-benefits

The hidden costs of agri-food systems are major contributors to the global state of *polycrisis*.[7] Addressing them is, therefore, essential. The unaccounted-for costs of agri-food systems contribute massively to the climate crisis (around 30% of greenhouse gas emissions are caused by food systems), biodiversity crisis (70% of biodiversity is endangered by agri-food systems), and health crisis (40% of the global population are overweight and around 10% are undernourished).[2] The staggering figures from SOFA (2023) underline the growing need to transform agri-food systems to tackle climate change, protect biodiversity and ensure healthy, affordable food for all. A recent study by the Food System Economics Commission concludes that the net benefits of achieving a food systems transformation amount to 5 to 10 trillion US dollars a year.[8] Achieving this, however, requires recognizing the full impacts of agriculture and food systems, including those not captured by current accounting and reporting mechanisms.

While hidden costs are an obstacle to sustainable transformation, agri-food systems also generate hidden benefits, e. g. through sustainable agricultural practices like agroforestry, organic agriculture and agroecology, which contribute to biodiversity conservation or the crucial role of small-scale agriculture in providing employment and preserving rural landscapes that are integral to cultural identity.[10] This shows that agri-food systems, when sustainable, can pave the way for more comprehensive benefits for the environment and society.

To date, policymakers and the corporate sector have largely ignored these hidden costs and benefits when addressing food system challenges, focusing instead on conventional metrics such as productivity or calorie intake when making decisions about agricultural subsidies and programmes to address food insecurity. By failing to integrate all costs and benefits into their decision-making processes, policymakers are missing an opportunity to design policies that simultaneously address multiple key challenges and thereby maximize benefits for people and the environment.

Box 1: Getting the math right – the problem of economic performance measurement

The capitalist economic system measures performance primarily in terms of economic growth. Among the standard metrics used, gross domestic product (GDP) is the most influential, serving as the primary measure of the value of marketed products and services and of the growth and success of economic activity. Practically all governments prioritize GDP growth as a key economic target.[1] GDP has also become the universal indicator of development, shaping economic and political strategies and providing a key benchmark for developing countries to achieve the SDGs. However, GDP has significant limitations: it prioritizes short-term growth, is limited to marketable products and services, and overlooks medium-term environmental impacts such as pollution and resource degradation, as well as long-term impacts such as climate change. In addition, it fails to consider the social consequences of economic growth.[11] Other economic performance metrics, such as productivity and price indexes, and business performance indicators, such as turnover, profit and return, focus solely on financial and produced capital. They overlook impacts and related costs on natural, human, and social capital.[12]

The current economic system undermines long-term sustainability

Excluding hidden costs from economic calculations distorts market signals and resource allocation, leading to practices that undermine long-term economic sustainability. The hidden costs and benefits of different production systems are not accounted for in farm performance metrics, business balance sheets, or national accounts, nor are they corrected by government policies. This gap in accounting at all economic levels creates an economic system that favours unsustainable and unhealthy practices over sustainable and healthy ones. It incentivizes policy decisions and business practices that exacerbate inequality and environmental degradation, which in turn hinder sustainable economic growth and public health improvements.[5, 13] The most glaring example of externalized costs is the fossil fuel industry, which was allowed to emit carbon dioxide into the atmosphere for more than 150 years without any financial consequences. As a result, we now face the urgent task of dealing with these unaccounted costs in the form of significant climate change impacts, not only for the current generation but also for generations to come. We can no longer claim ignorance and simply cannot afford to continue in this way.

For agri-food systems, this means that the market distortion impedes the affordability and profitability of sustainable food, presenting significant barriers to achieving resilient food systems. For example, the millions of smallholder farmers who practice sustainable agriculture should be rewarded for their positive impacts (such as their contribution to biodiversity conservation). Instead, they have to pay more to have their good practices certified. Hence, addressing the systemic shortcomings of current performance measurement necessitates a paradigm shift towards holistic and inclusive metrics of success.

Box 2: Transforming agri-food systems in times of crises

In recent decades, agri-food systems have been affected by and have contributed to multiple crises, and the management of these crises increasingly influences political agendas. Although social, political, health and environmental crises have always threatened different parts of the world, we are currently facing a deepening global *polycrisis*[7]; the confluence of numerous global challenges, including climate change, pandemics, and armed conflicts.[14] These intertwined crises have hampered efforts to transform our global agri-food system while underscoring the urgency of developing robust pathways to sustainability.

We are entering a global food crisis. Access to food is a human right, but despite significant increases in global food production, the agri-food system is failing to ensure access to adequate nutritious food for all, with hunger affecting up to 733 million people.[15, 16] Violent conflict is a leading cause of hunger, disrupting food production and distribution, and food is often used as a weapon of war.[14] Climate change exacerbates food insecurity, disproportionately affecting smallholders and pastoralists in developing countries.[17] Agri-food systems also contribute significantly to climate change, biodiversity loss, and desertification, with the conversion of natural ecosystems to farmland

as the greatest single driver of habitat loss.[18] Changing land use patterns and land scarcity are also driving food insecurity and inequality.[19] Recent trends and policies favouring the cultivation of non-food crops, such as biofuels and biomaterials, are reallocating land and other essential resources, reducing their availability for food production.[20] The crisis of food systems also has a social component. More than three billion people could not afford a healthy diet in 2021, with food system workers' wages often below liveable standards.[21, 22] Recent economic crises have worsened food security, forcing underprivileged groups to alter their diets while exacerbating malnutrition and non-communicable diseases.[3]

Beyond these more obvious crises, our food system is also driving a long-term health crisis, the implications of which are not immediately apparent. The consequences of this health crisis can be seen in our bodies. Changing dietary patterns over recent decades have significantly impacted our gut microbiome, reducing microbial diversity and disrupting microbial functions. One could say that our guts have undergone a kind of microbial desertification. The shift towards highly processed, sugar-based diets low in micronutrients and dietary fibres is linked to an increase in non-communicable diseases such as obesity, cardiovascular disease, and cancer, mediated largely by adverse changes in the gut microbiome.[23] The high cost to society of treating these diseases is not just financial, but also environmental and social. The global agri-food system imposes not only high healthcare costs but also high environmental and social costs that are borne by society as a whole. These include the costs of pollution, climate change mitigation and biodiversity loss.

A transformation of the food system is urgently needed to address the multiple global crises. However, current global governance structures are inadequate for decision-making in the agri-food system, with conflicting objectives among various governance initiatives.[24, 25] Moreover, we have seen a polarization of public opinion over food system transformation, with conflicts flaring between local and agroecological food advocates on one hand and agri-food corporations defending their economic interests on the other. In many cases, the media and social networks have exacerbated rather than alleviated these conflicts.[24]

From the political economy perspective, many of the problems in the agri-food system can be traced back to power imbalances, with multinational agribusinesses influencing government policies to prioritize large-scale commodity production and international trade.[26] Market concentration in the agri-food industry has bred a situation where sectors such as pesticides, seeds, agricultural machinery, and meat production are dominated by just a few companies.[24, 27] At the same time, research and development often focus on a few major staple crops rather than more nutritious ones, and largely ignore the challenges faced by smallholder farmers, who produce up to 80% of the food supply in Asia and Africa. [28–30] The financialization of a few agricultural commodities drives food price speculation and exacerbates price volatility, burdening low-income consumers.[31] The growth of demand for biofuels, resulting in a partial convergence of fuel and crop prices, has accelerated the trend towards financialization.[32] Consumer markets favour processed over nutritious foods due to political and financial structures that prioritize short-term gains. An analysis of the true costs of these dietary changes reveals how unsustainable they are in economic, social and environmental terms.

Aerial view of dead trees
© ollo

2 True Cost Accounting – redefining value to transform agri-food systems in times of crises

In this report, we present True Cost Accounting (TCA) as a strategic approach to address the hidden costs and benefits of agri-food systems, particularly in the context of multiple ongoing crises. By revealing these hidden costs, TCA takes a critical first step towards reducing them, thereby facilitating the transformation of agri-food systems towards greater sustainability. This chapter provides a brief overview of TCA.

TCA can be defined as an approach to evaluate the full range of environmental, social, economic, and health impacts and dependencies of economic production systems, including their hidden costs, benefits and risks.
In the context of agriculture and food production, TCA not only considers financial resources and produced goods (produced capital) but also the ecosystem services and natural resources provided by nature (natural capital) that we depend on for food production, as well as labour and know-how (human capital) and networks, relationships and social norms (social capital) that facilitate the production, distribution and consumption of food. TCA systematically assesses the dependencies (which indicate potential risks) of food systems on these capitals and considers the positive (hidden benefits) and negative impacts (hidden costs) of agri-food systems. Thus, TCA is an approach for developing more sustainable and socially just food systems. It can be applied in business, consumer and public policy contexts.

True Cost Accounting considers all four capitals: human, social, produced and natural capital

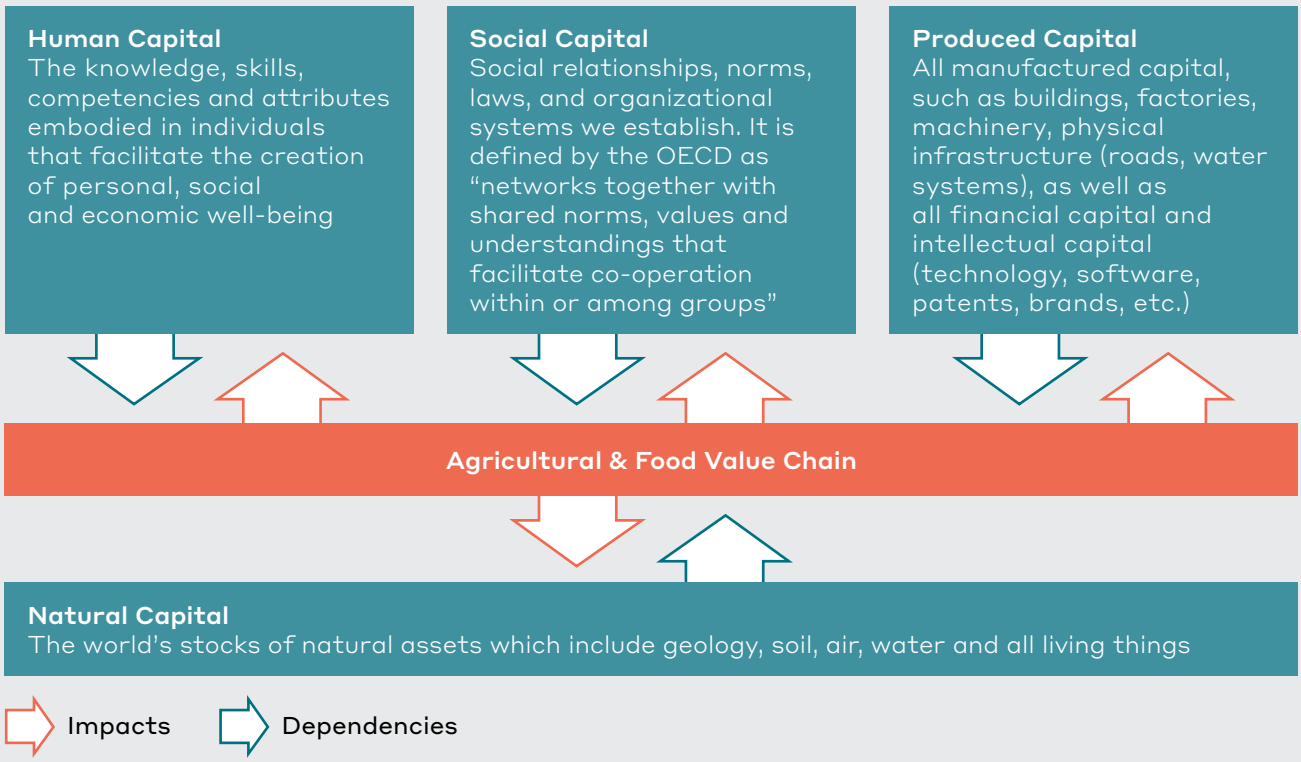


Figure 4: TCA follows a capitals approach and accounts for both impacts and dependencies in agri-food systems (own illustration)

True Cost Accounting can be imagined as a toolbox

Figure 5: The tools of True Cost Accounting (own illustration)

To illustrate how TCA works, we can cite a study of smallholder coffee farming in Vietnam. This study found that conventional coffee beans have significant unaccounted environmental and social costs, calculated at EUR 1.25 per kilogram. When these external costs are added to the farm-gate price of EUR 1.35 per kilo, the 'true price' of the coffee beans is EUR 2.60 per kilo. The most significant externalities identified were excessive water use, water pollution from fertilizer run-off, and high energy consumption, mainly due to inefficient irrigation and fertilizer production.[33] This example shows how TCA can be used to uncover the hidden impacts and full range of costs associated with agri-food systems, providing a more accurate basis for sustainable decision-making.

To understand the approach better, it is helpful to think of TCA as a toolbox that contains a torch, a measuring tape, a set of scales, and a megaphone. The torch symbolises TCA's ability to illuminate the externalities of our food system, identifying current issues and key dependencies. The measuring tape function of TCA allows us to measure environmental, social, and economic impacts. The scales represent the ability to evaluate and compare the different impacts by valuing them, making it easier to understand their proportional impact by expressing them in financial costs. Finally, TCA can serve as a megaphone to communicate and inform about these true costs, enabling producers, consumers, and policymakers to consider human well-being, human rights, and the environment in their decisions.[34]

The versatility of TCA allows its application in agri-food systems and across various other sectors of the economy, making it a valuable approach for informing stakeholders at all levels. However, it has become particularly relevant in the food and agriculture sector, where significant external costs directly impact production conditions and the livelihoods of many people.[35] Given that access to food is a fundamental human right and essential to human well-being, TCA offers a framework for addressing violations of that right, highlighting the urgent need for agri-food systems transformation.

TCA builds upon several established assessment and accounting methods, such as Life Cycle Assessment (LCA) and Economic Valuation, to assess the different forms of capital effectively.[36] TCA improves existing methods, such as traditional Cost-Benefit Analysis (CBA), by considering a wider array of externalities, stakeholders, and capital levels. However, by building on these existing methods, TCA also inherits some of their shortcomings. Value creation is intimately linked to societal values and ethical considerations, which calls into question the apparent neutrality of conventional economic systems. For example, TCA might assign a monetary value to the ecosystem services provided by a wetland, such as water purification and biodiversity support, reflecting an ethical stance on environmental conservation. The valuation depends on societal values and priorities, which can vary widely between different communities and cultures.[37]

The application of TCA is flexible. Its core idea – the integration of financial, natural, social, and human capital – would mark a significant shift in both decision-making and accounting practices, providing a more holistic assessment of the impacts of human activities. The way it is applied in practice and the metrics that are used for measurement and evaluation may vary. Potential areas of application range from decision-making to policy analysis and the integration of sustainability information into traditional accounting and reporting. It can also serve as a practical approach to measure the 'true price' of a product (see Chapter 3 for examples for each potential application area). This report presents TCA as a way to enable more holistic decision-making and improve performance measurement and accounting in support of sustainable development.

Selling vegetables at a street market; © FG Trade

3 Putting True Cost Accounting into practice

Although the development of specific application methodologies is still in its infancy, and the widespread use of TCA seems a long way off, this report aims to demonstrate the benefits that the practical application of TCA can bring in different contexts.

In Report 4 of this series, we introduced the Agri-food Systems Transformation Protocol as a decision-support tool designed to be used at different operational levels by various stakeholders in agri-food systems.[38] The Protocol outlines a four-stage, nine-step iterative process to guide the creation of transformation pathways across diverse contexts and implementation levels. TCA is an integral part of the Protocol that can help assess different conceptual ideas and measures.

TCA provides a robust framework for systemic analysis and holistic decision-making, offering critical insights to stakeholders across the agri-food sector. Policymakers can use TCA to inform policy design, while consumers can be empowered to make more informed, responsible choices and drive demand for sustainable products. For businesses, TCA can improve sustainability and risk management by revealing hidden dependencies and costs, while investors can identify sustainable investment opportunities. For farmers, TCA supports the adoption of sustainable practices, and when labelled or advertised, it can improve market access by providing a way to demonstrate the true benefits of their practices.

The Agri-food Systems Transformation Protocol with its four stages and nine steps

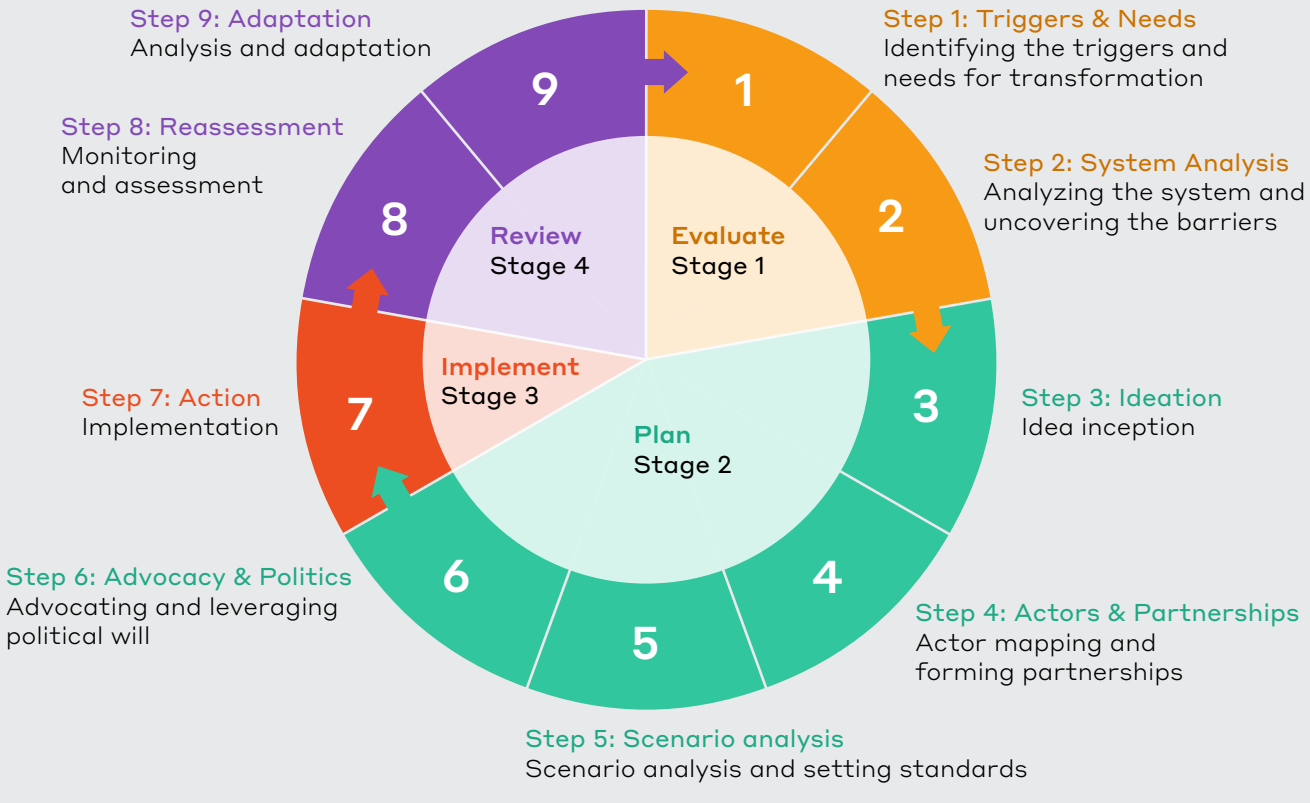


Figure 6: The Agri-food Systems Transformation Protocol (own illustration)

Ultimately, TCA has the potential to reform the economic foundation of agri-food systems by integrating hidden environmental and social costs into accounting and reporting practices. It thus not only promotes responsible and equitable business practices but also contributes to a broader rethinking of economic success beyond a narrow focus on GDP.

The following section presents various entry points for TCA analysis that can inform decision-makers, including policymakers and business executives, about the impacts of specific practices and policies, as well as potential alternatives. These entry points also demonstrate how TCA can be leveraged to promote a more sustainable economic foundation for agri-food systems. While some are tried and tested, others are entirely new to the application of TCA. Areas of application include agricultural practices, policy design and evaluation, advocacy, international policies, crisis evaluation and prevention, business performance and risk management, dietary patterns, and consumer information. Entry points further include measures to reform business accounting (microeconomic level), to implement new pricing mechanisms ('true pricing') and to change accounting and reporting at the national level (macroeconomic level) and global level. The global accounting system, largely shaped by developed countries and multinational corporations, often externalizes health and environmental costs to developing nations. Integrating hidden costs into accounting practices is therefore not only essential for sustainability but also a matter of global economic justice.

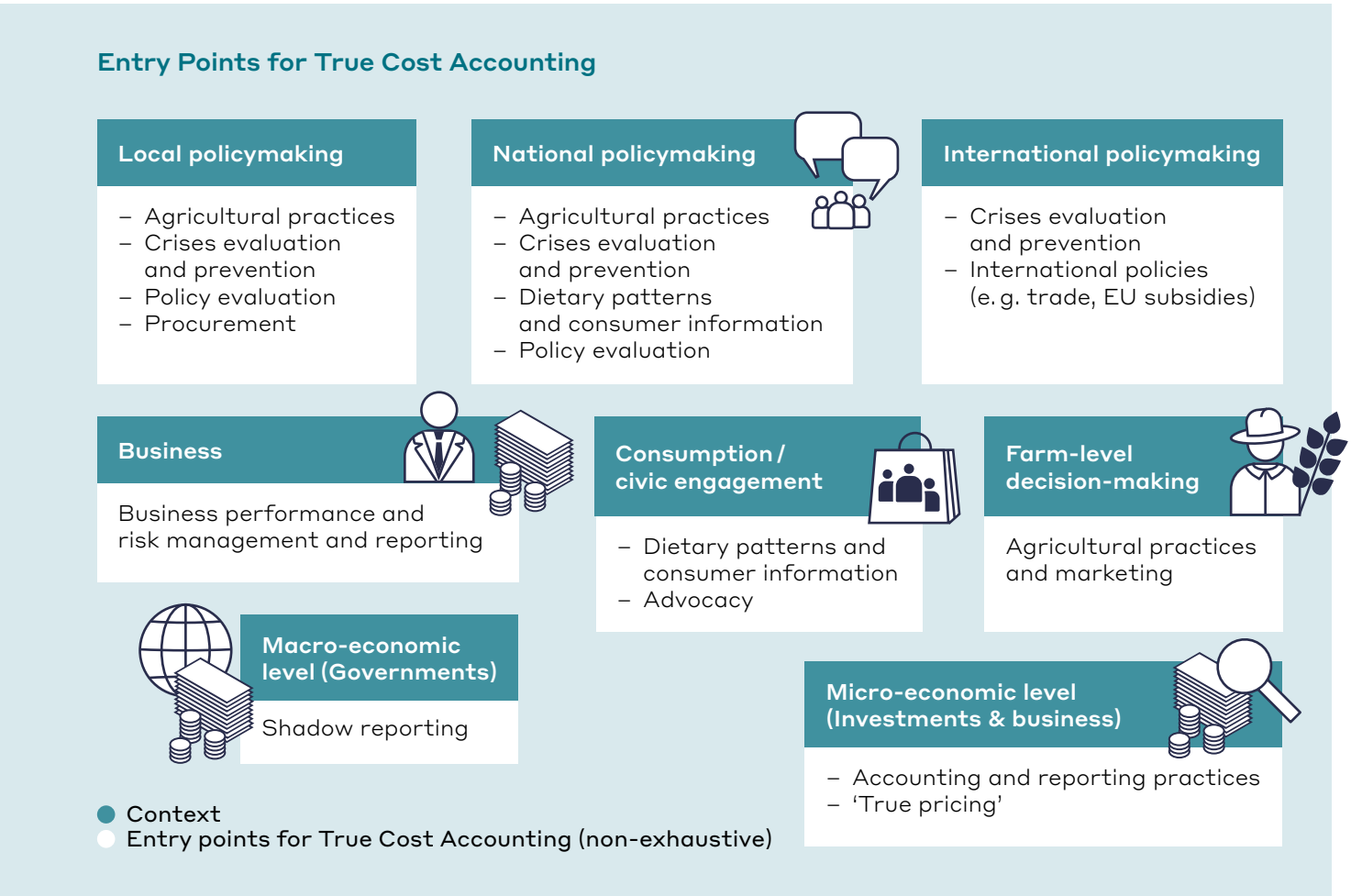


Figure 7: True Cost Accounting Entry Points (own illustration)

Agricultural practices

Context: Local and national policymaking, farmer-level decision-making

TCA has significant potential to drive transformative changes in agricultural practices by revealing the full range of economic, environmental, human and social impacts associated with different farming methods. By revealing the hidden costs and benefits of various agricultural production methods, TCA encourages the adoption of more sustainable and socially equitable practices. For instance, TCA can highlight the advantages of alternative production systems, including Indigenous food systems, by showcasing their sustainability and inherent benefits. This visibility can foster greater appreciation of these practices and promote their integration into mainstream food policies.[39] In India, for example, a TCA analysis showed that the adoption of agroecological practices by 630,000 farmers not only increased crop diversity and yields, but also increased the farmers' incomes by nearly 50%, improved health outcomes, and increased female labour force participation in villages with high adoption rates.[40]

Farmers are key stakeholders in the transition to sustainable food production. Knowledge of true costs can empower farmers to track the impacts of their activities, understand both the negative and positive externalities and long-term impacts of their practices on soil health, water quality, and biodiversity and hence promote more sustainable agricultural methods. TCA can also help farmers assess medium- to long-term risks in relation to the production base (land, water, etc.). This is important because negative externalities will sooner or later become risks for the continuation of agricultural production.

By recognizing the value of sustainable practices, TCA can also help ensure that farmers are fairly compensated for their efforts to protect the environment. One example in this context is the carbon sequestered in farm soils through diversified agroecological practices, which can be used to gain incentives and mitigate penalties for pollution.[12] TCA can also contribute to improved market access, as farmers who adopt sustainable practices and demonstrate their benefits may gain better market access. TCA may also promote resilience, as farmers who understand the true costs of their practices are more likely to adopt practices that improve resilience to climate change and other external shocks, ultimately enhancing profitability and sustainability.

Guidance for use:
A global initiative entitled "The Economics of Ecosystems and Biodiversity for Agriculture and Food (TEEBAgriFood)", launched in 2007 at the G8+5 meeting of Environment Ministers in Potsdam, Germany, has pioneered the application of TCA in agri-food systems. The TEEBAgriFood Evaluation Framework offers a valuable resource for TCA analyses in agri-food systems by applying whole systems thinking to the economics of agriculture. It includes case studies on how to apply TCA specifically to agricultural management systems. One tool for calculating the environmental impact of farms is the Cool Farm-Tool. It provides a free technical platform that calculates environmental impacts, such as greenhouse gas emissions and water consumption, based on primary data gathered by individual users. Other studies, such as Kathleen Merrigan's research on meat and meat alternatives in 'Balancing the Scale', examine the application of TCA in assessing different agricultural management systems.[41]

Policy design and evaluation

Context: Policymaking, Citizens

Evaluating the true costs associated with public or private sector policies at different levels allows governments and the public to assess the impacts of these policies on different groups, the economy and the environment, and identify potential unintended consequences.

TCA to replace CBA in ex-ante policy design. Many national governments currently use cost-benefit analyses (CBAs) to evaluate proposed policies and help decision-makers select the most desirable and cost-effective actions for governments to take. In the United States of America, retrospective reviews of CBAs have revealed inaccuracies, leading to growing interest in the use of TCA to provide more precise assessments by incorporating additional impacts such as worker well-being. So far, TCA has not been widely adopted as an alternative to CBA, but there are opportunities to do so.[42]

Producer subsidies and taxes are effective instruments to influence price and, therefore, the demand for products. Current agricultural support programmes tend to focus mainly on the production of staple foods and have increased the availability and affordability of certain crops while ignoring many nutritious foods such as fruits and vegetables. According to the 2023 FAO State of Food and Agriculture Report, *"Not only does much of this support distort markets, it does not reach many farmers, hurts the environment and does not promote the production of nutritious foods"* (p. 68).[2] A TCA analysis reveals the true costs of misdirected government support and provides insights that can guide the redirection of subsidies to reward environmentally sustainable, socially responsible and humane food production. Taxes on unhealthy products on the other hand, are a powerful instrument for reducing consumption. For example, an increasing number of countries are using taxes on sugar-sweetened beverages to promote healthier diets, an approach recommended by the WHO to prevent non-communicable diseases.[43] Another example is the Danish government's recent decision to introduce a tax on greenhouse gas emissions from agriculture, recognizing that livestock farming is a major driver of climate change. Denmark is the first country to introduce such a tax and, in doing so, to take a more holistic view of the industry's impact. The revenues will be pooled in a fund to support the livestock industry's green transition.[44] TCA can help assess and shape such tax policies. A TCA analysis of a pesticide tax in Thailand, for instance, evaluated the hidden expenses of pesticide use, revealing significant health costs to farm workers and suggesting that policy should prioritize non-chemical pest management methods over a pesticide tax, which would minimally reduce pesticide usage but increase government revenue.[37] Another sustainability lever that can benefit from TCA analysis is payments for ecosystem services (PES). PES involve beneficiaries of natural resources such as watercourses and forests, compensating those who maintain them. PES for watershed protection and carbon trading schemes have gained prominence in recent years.[45]

Fiscal subsidies to consumers are another lever to increase access to healthy and sustainable food, especially for disadvantaged groups. Examples include lowering the price of

food through subsidies paid to producers, increasing consumer income through cash transfer schemes, or direct provision through school meal programmes. TCA analyses can help design such interventions by highlighting the positive outcomes of cash transfers and school feeding programmes in terms of health outcomes and economic well-being.[2]

TCA is a powerful approach that can help local governments make more equitable decisions in **public procurement**. For example, in the United States of America, several local governments and school districts are leveraging TCA to make more sustainable procurement choices. The Minneapolis Public Schools use TCA to evaluate the environmental and social impacts of their food purchasing decisions, leading to the inclusion of more locally sourced and nutritious foods. Similarly, the City of Portland employs TCA to assess the broader implications of their procurement processes, ensuring that contracts reflect true value and long-term community benefits. By integrating TCA, local policymakers can make more informed and equitable decisions that enhance community well-being and resilience.[46]

Guidance for use:
In order to systematically integrate TCA into political decision-making, we propose a four-part framework, encompassing 1) comprehensive TCA analysis, 2) inclusive multi-stakeholder dialogue, and 3) strategic policy design and decision-making, 4) coupled with ancillary social policies.

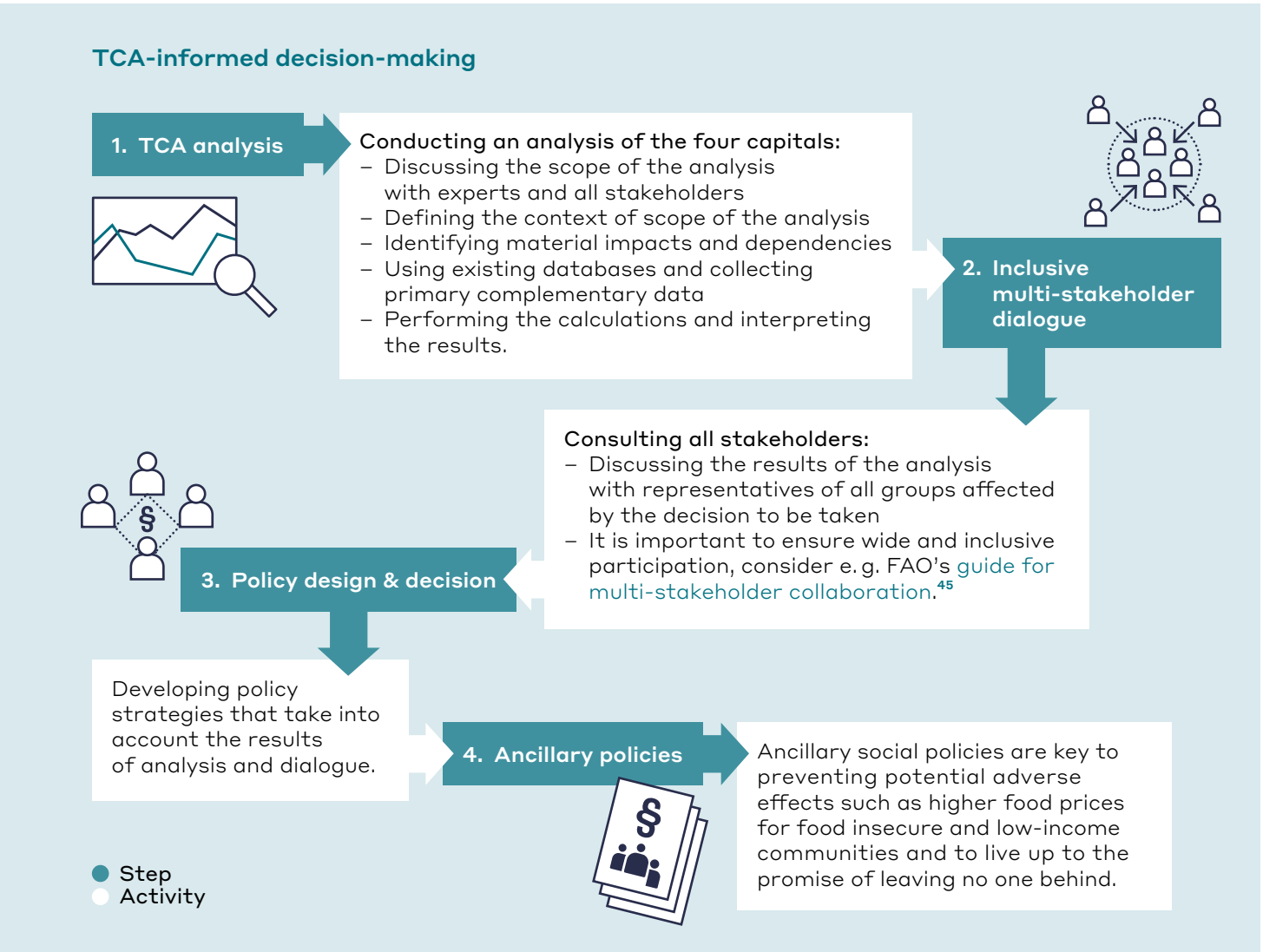


Figure 8: Integrating True Cost Accounting into decision-making processes (own illustration)

Advocacy work

Context: Citizens

TCA can support advocacy work for consumer groups and grassroots organizations, empowering stakeholders at all levels to hold businesses and governments accountable for their environmental, social and health impacts. By making costs visible, TCA can be used to visualize the glaring inequalities in our food system and highlight the consequences of unsustainable diets. It can thus serve to raise awareness of the true impact of our food choices and support advocacy work for systemic change. In particular, TCA can help address the human right to food by providing an approach to scrutinize the impact of current policies on food security and sovereignty and to suggest alternatives. TCA can thus help identify the reforms needed to ensure that our agri-food systems not only produce nutritious food but do so in an environmentally sustainable and socially just manner, thereby promoting food security and equitable access to nutritious food for all.

International policies / trade rules

Context: International policymaking

International agreements such as the rules and laws of the World Trade Organization (WTO) have a huge influence on policymaking related to agriculture and food. In an effort to minimize production costs for globally traded commodities – and in line with current WTO regulations – global food companies typically source primary resources where production costs, including labour, are lowest. In doing so, they typically ignore the environmental costs of cheap production, such as soil depletion, nutrient pollution, and water over-extraction. Integrating TCA into international trade policies can help ensure that the economic benefits derived from trade are balanced against the environmental and social costs and prevent the shifting of burdens to less powerful stakeholders within the global food value chains, such as smallholder farmers and agricultural workers.[48] The 2022 WTO Agreement on Fisheries Subsidies, which aims to eliminate harmful subsidies that contribute to the depletion of global fish stocks, is a step in the right direction as it aims to mitigate the negative environmental impacts of food production.[2]

Crises evaluation and prevention

Context: Policymaking

Policies devised to tackle externalities are central to addressing the world's interconnected crises. TCA demonstrates to policymakers that the costs of inaction far outweigh the costs of addressing the consequences of the biodiversity, climate and health crisis. At the same time, it can help evaluate different options for responding to these crises.

TCA can be used to capture the full range of environmental, social and human costs associated with climate-related disasters. For example, the 2019–2021 desert locust infestation along the Horn of Africa revealed that traditional pest control methods using toxic insecticides were causing significant unaccounted environmental damage, such as dramatic declines in honey production and loss of wild pollinators. TCA could have highlighted these externalities and promoted sustainable alternatives such as biopesticides. In addition, TCA can be used to assess the impact of climate-related events, such as the recent floods in South Sudan, revealing indirect social costs and justifying investment in preventative measures. By providing a detailed analysis of the true costs and benefits of different strategies, TCA supports the development of resilient, sustainable disaster management practices that are essential in the face of increasing climate threats.[49]

Guidance for use:
This area of application is relatively new, with few concrete examples. However, the authors of this report see great potential in applying TCA to anticipate and evaluate crises. As emissions and atmospheric concentrations of CO_2 rise, the costs of loss, damage and adaptation will escalate. Incorporating TCA into foresight analysis can help decision-makers to better understand the impacts of their policies, and actions and inaction on different capitals. Using conventional cost-benefit analysis, the costs of climate-related extreme weather events are often limited to infrastructure damage, overlooking significant externalized costs. TCA can fill this gap by promoting comprehensive early warning systems for pests and diseases and highlighting the intersection of negative externalities of food systems with climate-related health costs. TCA analyses could further contribute to implementing the One Health approach that links the physical environment and plant, animal and human health by focusing on holistic interventions.

Business performance and risk management

Context: Businesses, investment

Given that all economic activities occur within socio-ecological contexts, a company's economic success is inherently dependent on the proper functioning of socio-ecological systems. Growing awareness of these dependencies, risks and future costs associated with externalities is prompting policymakers and investor groups to demand greater transparency from companies.[50, 51] This is true for all economic sectors, not only agriculture and food. Investors are increasingly recognizing that externalities can affect financial performance and long-term sustainability, with potential consequences including fines, reputational damage, compliance costs,[2, 52] or scarcity of a particular natural resource crucial to a business (e. g. freshwater for beverage companies). If, for example, a manufacturing company that relies heavily on fossil fuels does not account for future costs associated with carbon emissions, such as carbon taxes, regulatory fines, or transitioning to renewable energy sources, it will jeopardize its future performance. Once stricter environmental regulations are applied, the company could face significant unexpected expenses, leading to a sudden drop in profits. If the company's financial reporting fails to consider these sustainability risks, it will overestimate performance, misleading investors and stakeholders. The Carbon Disclosure Project (CDP) found that many companies grossly underestimated the financial impacts of environmental regulations and market changes related to carbon emissions. These companies will likely face extremely high costs related to climate change in subsequent years, primarily due to regulatory measures and changing market conditions.[53] Sustainable practices, conversely, can increase customer loyalty, reduce regulatory risks, and save costs.[12] In addition, the agri-food sector faces growing pressure from consumers and civil society to adopt more sustainable and ethical practices and to conduct thorough environmental, social and governance (ESG) reporting that includes environmental and social impact and governance assessments integrated into financial statements.[54]

Unlike existing corporate accounting mechanisms, TCA integrates sustainability into core business strategies rather than treating it as a peripheral activity.[12, 36] This approach not only increases transparency but also enables companies to align more closely with international sustainability goals, thereby mitigating risk and promoting long-term financial stability. The integration of TCA practices can thus play a critical role in the sustainable transformation of industries, as highlighted by the True Cost Initiative.[55]

A few companies and organizations have begun to pilot TCA based on the recognition that it has the potential to guide food system transformation along virtuous pathways and even to generate significant economic gains.[6, 8]

Guidance for use:
The Capitals Coalition, a global network of businesses, financial institutions and governments campaigning to include the value of natural, social and human capital in decision-making, developed its Operational Guidelines for Businesses in collaboration with TEEB.[56] These offer a practical approach to recognizing and addressing the effects of business operations and their reliance on natural, human, social, and produced capital. They have been piloted and tested in seven different countries. The TCA AgriFood Handbook by the True Cost Initiative is another valuable resource.[55] It provides practical and very detailed instructions for agri-food businesses on measuring and valuing the hidden costs of their operations and integrating TCA information into management reports.

Dietary patterns and consumer information

Context: Policymaking, consumption, business

Applying TCA to diets reveals their positive and negative externalities and provides a framework for addressing changes in consumption patterns.[57] By utilizing TCA, policymakers and consumers can better understand the impacts of dietary choices, allowing for more informed decision-making that promotes public health and environmental sustainability.

Consumers can benefit from TCA as it provides a means to evaluate their dietary choices, understand the health impacts of food consumption and assess the environmental footprint of their diets. In this way, they can make more informed and responsible decisions. Increased awareness of true costs can shift consumer demand towards more sustainable and ethically produced goods, thereby encouraging businesses to adopt better practices and leading to better individual and community health outcomes.

The power of consumers in the food system is significantly influenced by how diet and health issues are framed. Food industry actors often shift the narrative from public health concerns to personal responsibility, thereby reducing consumer support for public interventions. This reframing suggests that food consumption is a matter of individual willpower despite evidence showing that malnutrition and obesity are complex conditions requiring governmental intervention to create healthy food environments.[58] An example of this is the city of Newcastle in the United Kingdom, which recently banned new fast food outlets in most areas of the city in response to high rates of childhood obesity, with up to 47% of children in some districts either overweight or obese.[59]

Policymakers can support regulatory measures for consumer information, such as front-of-pack labels and certifications. This is an effective way to steer consumers towards sustainable decisions. TCA can also be instrumental in generating the data for such consumer information. By broadening the scope, for example, by adding a social and health dimension to environmental labels (such as the Planet Score[60]) or databases (such as Agribalyse[61]) TCA can significantly enhance sustainability information and promote healthy food choices.

TCA can also be used by agri-food businesses to give their customers a fuller understanding of the true costs associated with their food choices, for example, by displaying a tracking code. This approach is especially valuable for businesses that are already producing sustainably.

Guidance for use:
Several initiatives are working on the true costs of diets. The EU project PLAN'EAT[62], for example, analyses the environmental, socio-economic and health impacts of European diets and their associated costs. It is currently developing a database with the average true costs of more than 200 European food products. An initiative in Germany recently tested the application of TCA analysis on consumers. For the 'true prices' campaign, a German supermarket chain labelled a selection of products with the 'true environmental price' next to the market price to inform customers about the hidden costs.[63] While most customers were unwilling to pay a higher price to cover the externalities, and some misunderstood the second price tag as part of a discount promotion, consumers are willing to change their behaviour, particularly by buying more organic products, when TCA-informed monetary incentives are provided.

Micro-economic level

Contexts: Business, investment

Trillions of dollars of investment are needed every year if we are to achieve sustainability goals such as the Paris Climate Agreement, the SDGs and the EU Green Deal. Public funding alone is not enough; the action of the private and financial sector in mobilizing and deploying capital is necessary. Sustainable finance mechanisms regulating financial markets to incorporate environmental, social and governance (ESG) criteria are crucial for steering investment, so they financially support a transition to sustainability.[64]

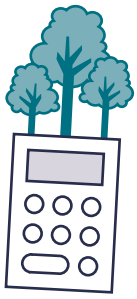
The EU Taxonomy for Sustainable Activities is a regulation that promotes transparency and accountability in sustainable finance within the EU. It sets criteria to define sustainable economic activities, guiding investors and ensuring that companies report on sustainability as part of their Corporate Social Responsibility (CSR) commitments. This transparency encourages investment in sustainable activities, offering better financing options to companies that comply with the taxonomy. New sustainability indicators, such as taxonomy-compliant revenue and capital expenditure, are reported under the Corporate Sustainability Reporting Directive (CSRD). These indicators combine financial and sustainability data, providing valuable insights for corporate management and improving the credibility of sustainability efforts.[64]

The work of organizations like the International Financial Reporting Standards Foundation (IFRSF) and the International Sustainability Standards Board (ISSB) on new accounting and reporting standards is an encouraging development but only a first small step in the right direction.[65] The ISSB, for instance, is developing guidelines for climate-related reporting mainly aimed at investors, while the EU CSRD, with its European Sustainability Reporting Standards (ESRS), is designed to provide information for a wider audience, including NGOs and the public, on both environmental and social issues.[66]

TCA supports sustainable finance efforts to transition to sustainable business models by further integrating financial and sustainability reporting. One form of TCA, Sustainable Performance Accounting (SPA), proposes an accounting method that integrates sustainability information into financial indicators like net income and return on equity (ROE). Under SPA, ESG matters are included in a separate accounting system, and these metrics inform management decisions and executive remuneration.[67] TCA and SPA also provide insurers and investors with insights into a company's resilience and future viability, enabling better risk assessments and improved loan conditions for more sustainable companies.

Guidance for use:
There are several TCA initiatives designed to incorporate sustainability and broader stakeholder impacts into financial assessments. However, they have all remained at a conceptual level, often considering either hidden benefits or hidden costs. For example, the "Richtig Rechnen" (German for "calculate correctly") project uses a farm-level accounting approach that assesses and monetizes sustainability performance (benefits) and integrates these values into an enhanced financial accounting system. Meanwhile, the Impact Institute has developed an Integrated Profit & Loss Assessment Methodology[68], which shifts the focus from maximizing shareholder profit to creating value for all stakeholders and produces impact statements aimed at promoting sustainable and inclusive business practices.[12] The SPA approach proposed by Henkel et al. (2024)[69] integrates ESG bookkeeping with traditional financial accounting to measure and manage a company's sustainability performance. This approach generates sustainable performance indicators, such as sustainable earnings before interest and taxes (SEBIT), and conceptually treats society and nature as implicit shareholders in the company.[69] There are other initiatives, like the TCA Alliance[70], which aims to create a network in Europe that campaigns for an accounting change, raises awareness among key stakeholders and drives research to demonstrate the feasibility and utility of TCA in the private sector and public policy.

'True pricing'



Context: Business, national policymaking

'True pricing' is another entry point for TCA. The term refers to an approach that adds the true costs of an item or service to its market cost, allowing for comprehensive comparison and representation of a product's total costs. The additional revenue is then used for prevention measures and damage mitigation. This approach aims to foster a more sustainable economy through transparency, remediation, and levelling the playing field, using market mechanisms to incentivize sustainability.[71]

Implementing the 'true pricing' approach involves five steps. The first step is calculating the true cost using the TCA approach. This involves identifying impact pathways and creating databases, quantifying the impacts using collected data, and monetizing these impacts with standardized valuation models. The True Price Foundation has introduced a rights-based framework integrating human, labour, and environmental rights into pricing models, accounting for negative external costs and proposing four corrective costs: restoration, compensation, prevention, and retribution.[57] The second step involves displaying the 'true cost' of products, increasing transparency, and enabling informed consumer choices. The third step establishes voluntary markets to offset remaining external costs that cannot be entirely eliminated by funding compensation measures like reforestation or greenhouse gas capture. Finally, the True Price Foundation proposes government measures such as taxation to incentivize the entire economy to adopt sustainable practices, creating a level playing field for all market players.[71]

The German coffee start-up *Truesday* applies 'true pricing' to its coffee products to reduce the negative impacts of coffee production and consumption.[72] They take into account many of the environmental and social costs of coffee cultivation, such as underpayment of farmers, soil contamination, and water pollution. By collaborating with international NGOs and social enterprises, Truesday aims to expose, reduce, and compensate for these hidden costs, enabling consumers to make informed, fair, and sustainable choices.

While considered innovative, the 'true price' approach has also been criticized as incomplete. A weakness of 'true pricing' is the lack of mechanisms for capping negative costs, unlike emissions trading, which is designed to encourage companies to reduce their impact. Second, a much-debated impact of 'true pricing' is higher food prices. Further research is needed to fully understand the economic and distributional impacts of 'true pricing' and its contribution to the transition to healthy and sustainable diets.[2] Thirdly, ancillary social policies are undoubtedly key to preventing potential adverse effects such as higher food prices for food-insecure and low-income communities and living up to the promise that no one will be left behind. The social consequences of 'true pricing' need to be carefully considered. To date, low market prices for food have been a key element in the fight against hunger and poverty. Both the 2008 food price crisis and the high cost of food after the outbreak of war in Ukraine have shown the consequences of higher food prices. Increased malnutrition and poverty, and sometimes demonstrations and riots over falling living standards, have changed the political landscape in some countries. The reason for price increases was not the inclusion of previously unaccounted-for externalities in the market price but price volatility and higher production and handling costs (caused by higher prices for energy, inputs, transport and market disruption). The lesson is clear: the introduction of TCA and progress in transitioning our economies towards sustainability require social innovation. Simply adding the cost of externalities to market prices without changing the social security system and effective anti-poverty policies will generate resistance and damages and may exacerbate social inequality.

Guidance for use:
Various initiatives aim to promote TCA in 'true pricing'. For instance, the True Price Foundation integrates the environmental and social costs of agri-food products into sale prices and has developed its own standard for 'true pricing'.[73] Several case studies have calculated the 'true price' of tea and coffee and propose guidelines for applying 'true pricing' n restaurants.[33, 74, 75]

Macro-economic level

Context: Policymaking

Accounting and analysis practices at the macroeconomic level urgently need to reform to reflect the full reality of national and international economic performance. Governments can begin addressing incomplete performance accounting and reporting methods by adopting shadow accounting practices. Shadow accounts reflect the environmental costs associated with resource extraction and commodity production. This dual approach allows for a more nuanced understanding of how we manage natural resources and highlights the disparities between developed and developing countries. By recognizing and accounting for hidden costs, countries can better advocate for equitable economic practices that do not disproportionately burden developing countries. This approach is consistent with academic proposals for environmental accounting reforms.[76]

Considerable progress has been made over the last few decades in integrating environmental data into financial accounts. Based on the internationally agreed System of Environmental-Economic Accounting (SEEA), a satellite to the United Nations System of National Accounts (SNA), environmental-economic accounts integrate statistical data on interactions between the environment and the economy using standard concepts, definitions, and classifications. SEEA serves as a valuable tool for policy analysis and impact assessment. It provides comprehensive indicators and descriptive statistics on the state of ecosystems and the services they provide.

Work began on the SEEA in the 1980s with the goal of including natural resource depletion and degradation into macroeconomic accounting. The result was the 1993 SEEA Handbook.[77] SEEA has since become the global standard for measuring nature's contribution to the economy and the environmental impact of economic activity. Although over 90 countries currently use SEEA, the majority report results in 'satellite' accounts.[78] The current revision of the SNA, last updated in 2008, offers an opportunity to incorporate the costs of biodiversity loss into economic planning. The new version, scheduled for adoption in 2025, will include new economic realities such as digitalization and globalization, as well as measures of sustainability and well-being.[79] It will also incorporate some elements of the SEEA, linking environmental data with economic indicators. However, aligning the SEEA with the SNA involves addressing challenges such as differing asset boundaries, ownership definitions, and valuation methods, particularly regarding environmental assets and ecosystem services, which are not fully integrated into the current SNA framework.[80]

The debate on adapting international accounting standards also offers an opportunity to tackle the tremendous shortcomings of GDP as a proxy for prosperity. Supporters of the 'Beyond GDP' movement hope to influence the SNA update and advocate for new rules and accounting standards.[81]

In recent years and decades, scientists have developed a number of alternatives to GDP, such as the Happy Planet Index or the Ecological Footprint.[82] By considering all four forms of capital, TCA offers a more holistic way to measure economic 'success' and align it to international goals such as the SDGs. Indeed, SDGs targets 15.9 and 17.19 were inspired by TCA, advocating respectively for the integration of ecosystem and biodiversity values into planning and development processes and the development of measures of progress towards sustainable development beyond GDP.[83]

Crates of oranges, Marrakech, Morocco
© Ferran Feixas on Unsplash

4 Towards an economic foundation for sustainable development

While the international community has agreed on goals and targets (such as SDGs, Paris Climate Agreement, and Convention on Biological Diversity), the necessary action – mainly but not only from national governments and the private sector – is insufficient to get us out of the escalating polycrisis. As shown in the previous reports of this series, the term 'transformation' is frequently used in discussions at international, national and local levels and has become a new paradigm in the agri-food sector. However, there is no consensus on the specific goals to be achieved, let alone on how to achieve them. The debate on transformation often ignores a crucial fact: we operate in economic systems that promote the privatization of profits and the socialization of environmental, social and economic costs. This is because nature and future generations cannot claim compensation, and many of these costs are either hidden, deferred or unfairly borne by others. Current systems of economic accounting do not capture all the costs of climate disruption and health problems caused by unhealthy diets and unsafe foods. They mask the full impact of how we use resources, produce and consume food, and do business. Current decision-making is often based on false assumptions and ignores the true costs of our actions. Externalities are hidden from accounting, reporting and analysis, but they are real costs that eventually get paid – by society and future generations rather than by those who cause them. Not only do these externalities contribute to inequalities by placing a much greater burden on disadvantaged groups and low-income countries, but they also fuel the current crises.

TCA identifies externalities and measures their impacts. Of course, the answer to incomplete accounting and reporting is not to simply add the hidden costs to the market prices of products and services but to comprehensively reassess costs and benefits at multiple leverage points. The strength of the TCA approach lies in translating systems thinking into concrete decision-making and action by providing a holistic view of necessary changes across all sectors. Considering the impact of an action on produced, human, social and natural capital is just the first step towards a reassessment of actions and the prevention of further damage. Though research on and application of TCA has been most prevalent in the agri-food sector, this report argues for its application in all sectors of the economy to support sustainable development.

There are several windows of opportunity to redesign our system of economic accounting and reporting to take greater account of hidden environmental, social and health costs and benefits. In the following, we provide examples of positive processes and outline the necessary steps and responsible parties to build a sustainable economy that works for, not against, people and the planet.

Current economic systems lead to the privatization of profits and the socialization of environmental, social and economic costs

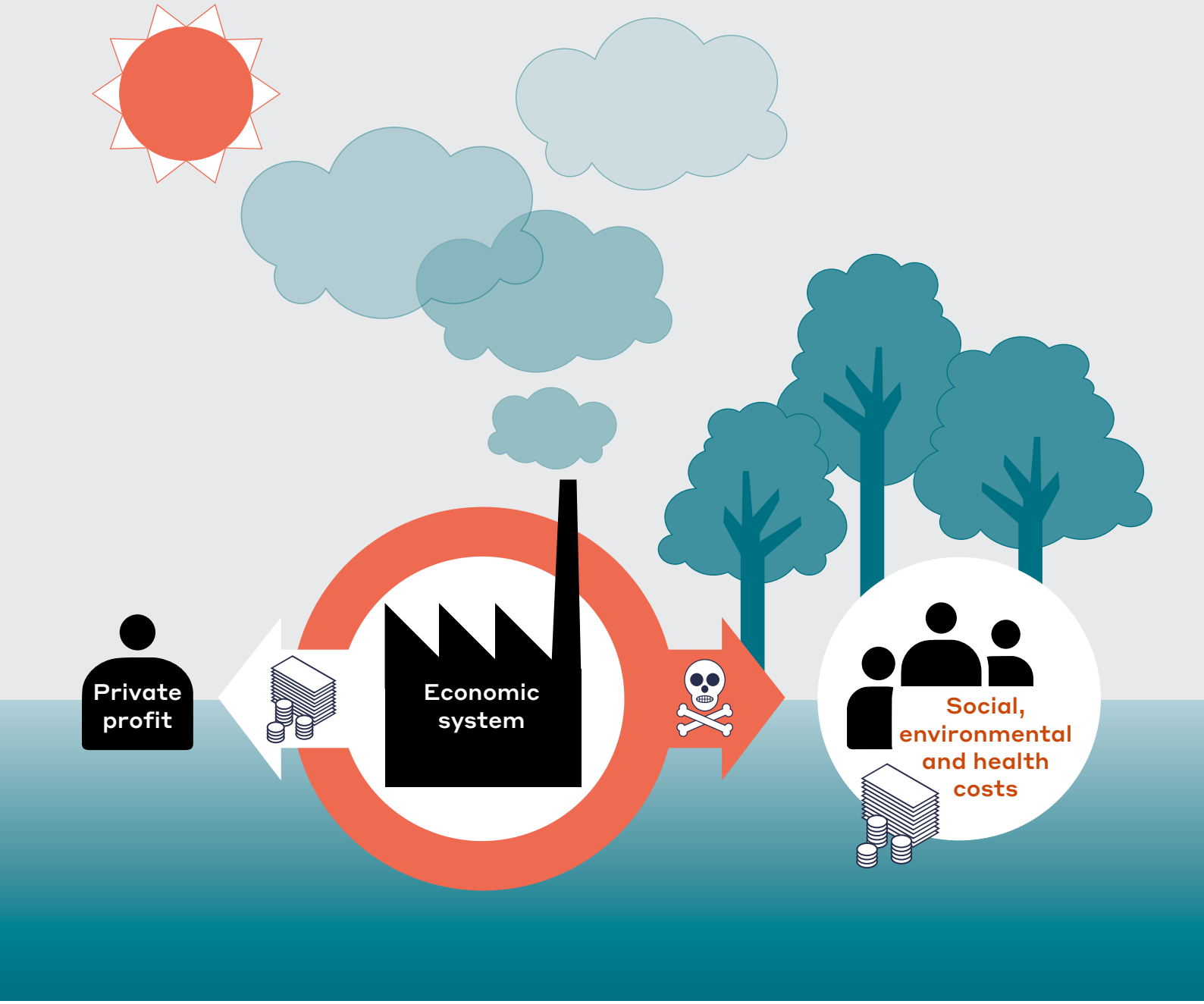


Figure 9: Current economic systems lead to the privatization of profits and the socialization of environmental, social and economic costs (own illustration)

Macroeconomic level:
The United Nations 'Beyond GDP' process, led by Secretary-General Guterres, aims to develop a universal and comprehensive measurement of progress and sustainable development to complement GDP and better reflect the full impact of economic activity. Member States are being asked to commit to developing a conceptual framework anchored in the SDGs, enabling policies and metrics to measure, report, and mitigate social, environmental, and health externalities. They should contribute funding for research and development and enable statistical capacity development, especially but not only in developing countries, and support the work of the independent expert group in charge of developing new indicators for economic success. Establishing global data management in an independent entity under the auspices of the United Nations (UN), such as the UN Statistics Division, is essential to ensuring transparency, accountability, and open access to data.

The System of National Accounts (SNA), the international standard for compiling national economic accounts, is engaged in a process of updating its framework by incorporating new economic realities such as digitalization, globalization, and the costs of biodiversity loss. The new version is expected to be adopted in 2025. While compliance with the SNA remains voluntary, the mere mention of sustainability measures is an important signal. Although not yet in sight, the new SNA version should be closely aligned with the System of Environmental-Economic Accounting (SEEA), strengthening its incorporation into national accounting and reporting. In the medium term, governments should commit to a stronger integration of natural, human, and social capital in national accounting and decision-making.

Microeconomic level:
The development of new accounting and reporting standards by organizations like the International Financial Reporting Standards Foundation (IFRSF), which develops global accounting standards and climate-related reporting guidelines for investors, is a step in the right direction. So is the new CSRD, through which the EU requires many more companies than before to include sustainability reporting in their annual reports. Decades of unsuccessful voluntary commitments have taught us that mandatory policies and standardized business reporting on energy use, CO_2 emissions, human rights, and labour conditions are required to ensure that companies improve their sustainability practices. For example, by 2019 – four years after the signing of the Paris Climate Agreement – only 10% of the 1,168 European companies surveyed by Deloitte (2019)[84] had set themselves targets compatible with limiting global warming to 1.5 degrees.

Business accounting standards are typically derived from national legislation or frameworks established by the International Accounting Standards Board (IASB), whose recommendations are often incorporated into national regulations. Action alliances such as the TCA Alliance[70] or the TCA Accelerator[85] provide an opportunity for businesses, NGOs, and other stakeholders to advocate for the integration of environmental, social and health factors into financial reporting, and to lobby the IASB and national legislators in favour of integrated reporting. Pilot projects led by pioneering companies demonstrate the feasibility of this approach.

Useful references for businesses in this context include the Operational Guidelines developed by the Capitals Coalition in collaboration with TEEB[56], which help companies assess their impact on different forms of capital, and the TCA AgriFood Handbook[55], which provides detailed guidance for agri-food businesses on how to measure hidden operating costs and integrate this information into their reporting.

Sustainable finance:
In Europe, the EU Taxonomy for Sustainable Activities categorizes which financial products and investments contribute to environmental goals, such as climate protection, and can be considered sustainable. The financial sector needs taxonomies like this at a global level in order to define criteria for sustainable investment and achieve agreed goals, such as the Paris Climate Agreement. Financial institutions should be required to regularly disclose their environmental and social impacts. More asset managers and finance 'frontrunners' are needed to lead by example on how to design future-proof business models that support the SDGs.

Political context:
In order to make systemic decision-making a standard in policymaking and to break down policy silos in favour of holistic solutions, it is essential to adopt TCA-aligned approaches at local, national and regional levels. These approaches can assess the positive and negative impacts of different policy options on the four forms of capital. As shown in Chapter 3, TCA could, for example, replace CBA (commonly used in the United States of America and the United Kingdom) in ex-ante policy design. In addition, TCA can inform the design of subsidies, tax regulations, and public procurement policies. For TCA to be integrated into policy frameworks, continuous efforts are needed to demonstrate its benefits to policymakers. Academic and civil society networks should work closely to build on the growing evidence of positive examples.

Consumer context:
In order to gain broad support in society for sustainable development and the necessary transformation, including economic reform, consumers must be informed about the impacts and hidden costs of unsustainable production and consumption. TCA can enhance the reliability of sustainability labels by providing verifiable background information, helping consumers to make more informed and responsible choices. TCA-based consumer information can empower individuals and groups to demand sustainably and ethically produced goods, encourage companies to adopt better practices, and contribute to improved health outcomes for communities. In addition, consumer organizations could use TCA-based data on externalities to provide independent, evidence-based advice. For this reason, TCA methodologies and data should be treated as public goods, accessible and open to scientific scrutiny. Such transparency would allow sustainability certification to be based on a harmonized and science-based system, effectively countering greenwashing and ensuring the credibility of sustainability claims.

The implementation of systemic decision-making and the widespread adoption of TCA in business, finance and politics, will undoubtedly be challenging. Resistance is inevitable from those who fear economic losses. TCA is not a panacea, but it is one of several key approaches to fix the underlying problems of our economic system. By shedding light on hidden costs and providing guidance on sustainable practices, TCA is paving the way for meaningful economic reform. Join us in our upcoming blog series as we explore the evolution and future potential of TCA, its implications for sustainable development, and how each of us can play a role in this crucial journey.

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4C FORESEE SERIES

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About the project

TMG Research gGmbH is working to develop a more systematic understanding of how agri-food systems can be transformed through its project on the *Assessment and Communication of Climate Impacts of Food* (CLIF), which is funded by the International Climate Initiative (IKI) of Germany's Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and implemented jointly by Corsus and WWF Germany. This project promotes sustainable consumption patterns and helps companies, policymakers, and consumers choose more sustainable options in relation to food. The main contribution of TMG to this project is publishing a series of strategic reports on the status of agri-food systems and the likely drivers and agents of their transformation.

This report is part of the FORESEE (4C) series on *The Transformation of Agri-food Systems in Times of Multiple Crises*, which looks at challenges faced by agri-food systems linked to multiple crises (4 Cs: Climate, COVID-19, Conflict, Cost of externalities) and how these intensify the urgency of transforming agri-food systems. This report advocates for True Cost Accounting (TCA) as an approach for transforming agri-food systems by revealing hidden environmental, social and health costs often ignored in traditional economic analyses. By incorporating these overlooked externalities, TCA encourages more sustainable decision decision-making in policy, investment, and business. The report suggests practical entry points for implementing TCA in different contexts, highlighting its potential to drive systemic change and support sustainable economic reforms. The report was drafted by TMG in consultation with a broad group of experts.

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