

Working paper

**True Cost Accounting
and Dietary Patterns:
A Strategy for Transformative
Food Systems**

True Cost Accounting and Dietary Patterns: A Strategy for Transformative Food Systems

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In this paper we argue that global responses to a range of policy challenges should be coordinated within the framework of 'food system policy.' The world's food systems faces a set of interlinked challenges, needing to realise the right to food for a growing global population (FAO, 2005), achieve the internationally agreed targets of the Paris Agreement (United Nations, 2015), and stay within the planet's environmental limits (Rockström et al, 2009). At present food systems are part of the problem, causing or contributing to a host of environmental and social crises - including massive soil loss; water pollution with nitrogen, phosphorus, and a range of toxic chemicals; air pollution from confined animal feeding operations; species loss as new, biodiverse areas are put under the plough; 24% of total atmospheric CO₂ additions annually; sub-living wages and high-risk jobs. Yet they can be part of the solution if we move beyond the current policy stasis to develop comprehensive, wide-ranging and truly transformative food system policy change.

The present environmental and social challenge is especially acute when it comes to the need for equitable action to avoid the looming climate crisis, inarguably the greatest challenge that has faced modern humankind. But tackling such a systemic challenge poses particular difficulties: when every area of life is implicated, where do we start? We argue in this paper that the starting point for analysis, action agenda development, policy development, and rapid implementation should be the food that people eat – and the food they don't eat – on a national level. An approach that begins with dietary patterns supports policies aimed at changing both the demand and supply sides of food consumption patterns.

Dietary patterns expose all the positive and negative externalities of our food system in one place, providing a framework for comprehensive analysis.

It is also clear that dietary patterns change dramatically with economic growth (Tilman and Clark, 2014) – often becoming less sustainable. This means that making changes to our food systems will be even more important in future, yet the economic metrics that currently determine their functioning largely ignore externalities and provide greatly distorted incentives to continue on our current destructive path. If we return our focus to the plate we are reminded that any food system should ensure environmental and social sustainability, at a minimum guaranteeing the following:

- **staying within the earth's planetary boundaries,**
- **increasing the circularity of natural resources, including the safe use of human waste,**
- **avoidance of food loss and food waste,**
- **food and nutrition security for all people,**
- **minimized morbidity and premature mortality due to dietary patterns and other damage to human health from within the food system,**
- **upholding Human Rights for all people as set out in the UDHR,**
- **gender and racial equity and equality across the supply chain,**
- **participatory governance of food systems and within supply chains,**



- **dignity, opportunity, and liveable wages for all workers in the supply chain,**

- **reasonable incomes and profits for firms in the supply chain including the primary producers (i.e. farmers).**

To achieve this transformation, a whole new set of policies must be devised and put into practice, coupled to a new system of economic accounting. Though over 100 countries have national dietary guidelines (see FAO's database of food-based dietary guidelines), only a handful including Brazil, The Netherlands, and Sweden, have incorporated environmental sustainability into them. National guidelines, while often impacting government procurement and food assistance programs, have far fewer food system impacts than needed since they are minimally connected to agricultural or supply chain policy and typically do not include ancillary policy elements that could nudge people towards healthy, sustainable dietary patterns. For example, although we know that humanity should, on average, approximately double its intake of fruits and vegetables there is very little agricultural policy that preferences their production and distribution – while there is a great deal of policy that preferences the production and distribution of animal products. No country has a liveable wage mandate in any of its policy.

A holistic and transformative food system policy agenda could be underpinned by True Cost Accounting (TCA). TCA, calculated with reference to four capitals – natural, human, social, and produced – can be used to track complete supply chains so that a broad array of external costs can be understood. Both positive and negative impacts are identified as well as the extent of circularity in resource use; TCA

can therefore help to identify effective strategies for producing food sustainably. It can also be used to identify externalized costs in terms of human welfare, rights, and security. Following this process makes it possible to more precisely identify those changes that need to be made in order to deliver nutritious, socially just and environmentally sustainable global food systems. This is a necessary precondition for coherent food systems policies for individual nations and the global good.

Beginning with dietary patterns also means re-examining our science to identify ways in which our current food sustainability analysis operates within the paradigm of destructive practices, while systematically ignoring potential alternatives with better 'metrics'. For example, organic production has been shown to have potential across several metrics (Eyhorn et al, 2019) and could benefit from greater research and development support. Another, complex example comes from animal production. Animal production, especially ruminants, is typically demonstrated to have the worst environmental characteristics on the dining plate (Willett et al, 2019). However, there is evidence that pastured beef, managed appropriately, can have the opposite impact (Stanley et al, 2018). Such subjects should be examined in more depth with research across greater time intervals and in a wider range of locations.

To date, TCA has not been applied to food systems in a comprehensive, holistic way. The brief examples above illustrate the need to adopt TCA in policy development beginning with dietary patterns, in ways that are not constrained by current paradigms of production and trade. Yet up to now TCA has predominantly been used to help improve the sustainability of



individual private sector products, supply chains, or overall business plans. Such measures can help to make improvements in the existing global food system; see for example the private sector initiative 'True Cost – From Costs to Benefits in Food and Farming' (Hamm, Riemer and Müller, 2019). However, with their generally narrow focus these strategies do not pose broader questions, such as whether particular product(s) or sectors should be supported in policy at all, when they are fundamentally destructive of the environment and/or strongly associated with increased human morbidity or mortality. This is particularly true at the production level where there is the greatest gap between policy and human health impacts. Government food policies have largely been structured around agriculture, detached from food consumption and its impacts beyond GDP. Agricultural policy has largely reinforced dominant production paradigms that have demonstrated their tendency to degrade and destroy the environment.

TCA can be used to develop coherent policy frameworks that are both supply- and demand-driven, starting from a dietary pattern perspective, and paying attention to the diversity of diets both within and between countries. Fruit and vegetable consumption are used here as an example. The WHO recommends a minimum of 400 gm/day consumption (World Health Organization, 2020); most data indicate that, on average, we need to nearly double our consumption. Other data demonstrate that large amounts of produce are lost or wasted within the food system (FAO, 2013). Yet average consumption figures do not give a complete picture of the dietary patterns of a country, or their impacts; a range of dietary patterns equates to a range of carbon

footprints. Policy development approaches should bear this fact in mind.

For example, 20% of US consumers account for over 40% of the country's diet-related greenhouse gas emissions, typically due to their high meat consumption (Rose et al, 2019). There is typically an inverse relationship between the consumption of meat and fruits and vegetables (Fogelholm et al, 2009). Thus the demand side of policy needs to be geared towards a healthier dietary pattern overall with a doubling of fruit and vegetable consumption, and a reduction in meat consumption. Policies that can be explored to increase demand-side consumption include targeted food taxes, public procurement programs, cash transfers through social welfare systems, institutional food mandates, educational programs, and others. Policies can also be explored to increase individuals' purchasing power by, for example, creating a living wage mandate economy-wide. Given the level of waste in the produce sector identifying policies to reduce both consumer and pre-consumer waste are also necessary.

TCA can also be applied along the supply chain to:

- analyse the externalities of packaging (e.g. those releasing endocrine disrupting chemicals, plastic waste on land and in oceans) and create policy, research, and development for reducing the environmental and human health impacts;
- analyse the impacts of distance to market, and separate the overall impacts of the food system from specific impacts in the produce sector. For example, currently shorter supply chains are more easily electrified relative to longer supply chains,



offering opportunities for the use of renewable energy (Liimatainen, van Vliet and Aplyn, 2019). In the produce part of the food plate transportation is an important part of the environmental cost of our food system (Plawecki et al, 2013);

- analyse the impacts of different production paradigms – e.g. conventional and organic land based, greenhouse and unheated/unlit hoop house production, vertical farm production;
- analyse the impacts of a living wage and scale-sensitive purchasing practices across the supply chain;
- analyse the impact of incentives to stimulate the purchase and consumption of healthier options.

These and other elements provide opportunities to evaluate positive and negative externalities as well as the knock-on impacts of different choices. They therefore point to strategies for policy that makes external costs visible, 'internalising' them by incorporating them into prices, while magnifying and incentivising positive impacts.

In some cases, existing data are clear and may give strong indications for policy. For example, several pesticides have been associated with a variety of diseases, especially cancers. Among approximately 389 pesticides approved for conventional production in the EU, 102 are acutely toxic, and 28 carcinogenic (Directorate-General for Parliamentary Research Services (European Parliament), 2017). By comparison, of approximately 35 pesticides approved for organic use in the EU, only pyrethroids demonstrate acute toxicity and none are carcinogenic. These figures could

lead us to conclude that policies should be developed that preference organic production – research, development, innovation, production, and marketing – with additional policies to make organic food available to all a nation's people.

TCA can also play a role in incentivising natural resource circularity (the use of waste as inputs for the next cycle of production and distribution), an important component of efforts to stay within the planetary boundaries. In this context it is of paramount importance to address the issue of reusing human waste, which comes with a host of challenges including chemical, heavy metal, and microbial contamination. This necessitates policy to encourage technical, engineering, and social science research to make using human waste in, for example, fruit and vegetable production feasible, safe, and socially accepted, which it currently is not. This also implies production sites being located closer to consumption. Thus, this one principle – natural resource circularity – implies a host of policy challenges. Yet it also provides a wide range of opportunities once comprehensive, transformative policies have been put into place. Circularity also requires putting an internalized price on polluting practices; TCA can therefore aid implementation of the 1992 Rio principles 15 (pre-cautionary principle) and 16 (polluter pays) within the food system context (Stakeholder Forum for a Sustainable Future, 2012).

A food system-based approach, beginning with dietary patterns, provides a path towards a future in which we keep below the ceiling of the planetary limits and above the floor of social rights as described by Raworth (2017). This is a challenging prospect, but one which could catalyse a huge range of much-needed changes.



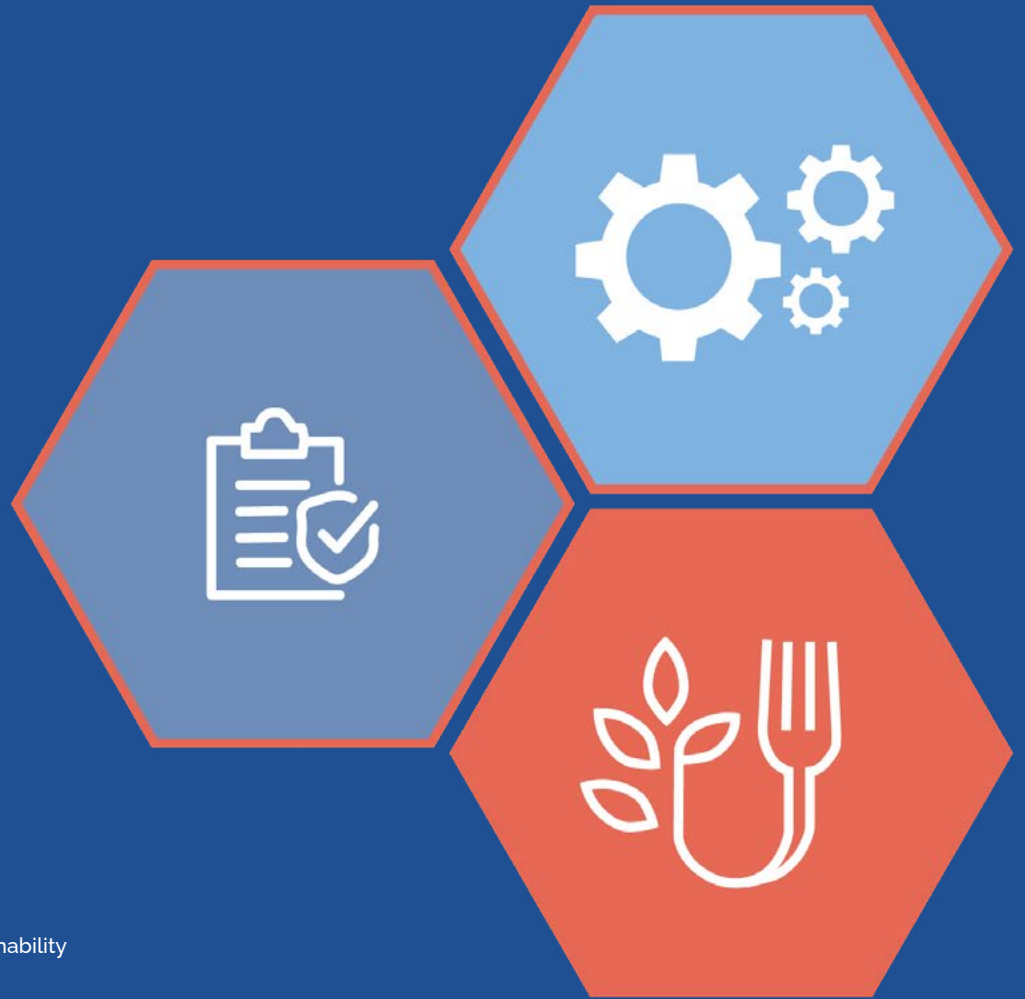
Within the food system we can shift to renewable energy while also drastically reducing the incidence of air pollution-related diseases; markedly improve water quality across the globe; boost human and planetary health; ensure liveable wages throughout supply chains; advance gender and racial equity while expanding opportunity and meaningful work; and stop the decline of biodiversity.

These changes will bring huge benefits to vast swathes of the world's population,

but they will entail a cost for some, given the need to end business as usual. This is the nature of epochal change, or what Schumpeter (2008) called 'creative destruction'. It requires strong governance addressing all goals simultaneously. Dietary pattern-based public policy, utilizing True Cost Accounting, can be a key tool. Just as fossil energy must be phased out by closing coal mines and disrupting CO₂-heavy value chains, the transformation of the food system must be total. We cannot simply tinker with the 20th century model.

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WWF – the World Wide Fund for Nature is implementing a programme on Sustainable Consumption and Production (SCP) in the agri-food sector, funded through the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). In Thailand, Indonesia, Philippines, Colombia and Paraguay, WWF is developing solutions towards sustainable food systems tailored to their own national contexts, whilst advocating systemic policy changes at global level.

To this end, TMG – Töpfer, Müller, Gaßner GmbH was commissioned to carry out an analysis of the true costs of sustainable and healthy food and develop a concept on how this tool (True Cost Accounting, TCA) can be argued for – and what political asks can be phrased from it – starting from the vantage point of sustainable diets.



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