THE
Real Cost
OF
FOOD
EXAMINING THE SOCIAL, ENVIRONMENTAL, AND HEALTH IMPACTS OF PRODUCING FOOD
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Chicken is the most popular meat consumed in the United States, according to a recent report by Oxfam America—consumers eat an astounding 8.5 billion chickens every year. And while the industry earns more than US$50 billion annually, poultry processing workers—the people who cut, trim, package, bread, and freeze the chicken breasts and other cuts favored by U.S. eaters—earn only US$10-11 per hour. For comparison, the president and CEO of Tyson Foods, earned US$12.2 million in 2014, says the Oxfam report, or 550 times what the average line worker earns.1

But low wages aren’t the only cost associated with working in the poultry industry. Workers stand in one place for long hours—12 hours shifts are not unusual—and suffer from repetitive stress injuries. They are also expected to work very quickly. Processing line speeds are double what they were in the late 1970s, leading to injuries. Because of high turnover, the industry relies on vulnerable communities as employees including recent immigrants and refugees.

The industry has a responsibility to change—and can do so without losing profit or raising prices significantly for consumers. The more than 250,000 workers in the poultry industry deserve fair compensation, the ability to voice their concerns, and a safe, healthy environment in which to work. And they deserve something that’s hard to place a price on—dignity in the workplace and recognition that they’re feeding millions of Americans each day.

There’s no doubt that the current global food system has high and mostly hidden costs—for workers, for human health, for the state of the environment, for women’s rights, for animal welfare, and for farmers. In addition, eaters don’t pay the “true” price of food at markets or grocery stores because pollution, water scarcity, soil degradation, increasing greenhouse gas emissions, poor labor standards, obesity and other non-communicable diseases are not part of the accounting to determine prices.

There are costs associated with a broken food system:

- In 2015, there were roughly 400 cases of cyclosporiasis, an intestinal illness linked to cilantro contaminated with human feces because workers in fields in Mexico don’t have access to bathrooms or the ability to wash their hands in fields;2

- The drought in California will likely cost farmers some US$3 billion, more than 18,000 jobs, and 564,000 acres fallowed;3

- Globally, the agriculture sector utilizes 70 percent of freshwater;

- Roughly 20 percent of all liver cancers in are linked to aflatoxin contamination in maize—a toxic mold caused by poor production and storage practices—particularly in sub-Saharan Africa;

- Unprecedented amounts of topsoil are being lost in Brazil and China as a result of clearing land for agriculture;

- Researchers from the McKinsey Global Institute estimate that excess weight and obesity costs US$2 trillion globally in healthcare costs;4

- And according to the Economics of Ecosystems and Biodiversity (TEEB), farmers are rarely incentivized to protect biodiversity; instead, they are rewarded for short-term gains like increasing yields and expanding agricultural land.5

It’s only over the last few years that researchers, businesses, policymakers, and eaters are beginning to understand that the price they pay at the grocery store, market, and restaurant for their meals doesn’t reflect the true cost of food production. True Cost Accounting (TCA) is an economic model that allows all of us, as eaters, to understand the full cost of everything that goes into producing food. From fertilizer production and fossil fuel use, to algae blooms and antibiotic resistance.

One of the most ardent supporters of this idea is the Prince of Wales. HRH Prince Charles has questioned the world’s aggressive search for cheap food and has called for TCA as an alternative, where all the costs associated with business are tallied, including soil depletion, water pollution, and loss of biodiversity. Other global leaders, both elected and non-elected, would be wise to follow the Prince’s example. The world has depleted nature’s bank account for far too long.

Fortunately, a number of organizations and funders—from The Economics of Ecosystems and Biodiversity and the Sustainable Food Trust to the Global Alliance for the Future of Food—are taking on the challenge of putting a value on the problems and benefits created by different methods of food production. It is Food Tank’s honor to be able to highlight the work of these groups and encourage farmers, businesses, policymakers, and the funding communities to incorporate these principles into their own work. This report, The Real Cost of Food: Examining the Social, Environmental, and Health Impacts of Producing Food, hopes to give an overview of the current work being done on TCA, where the gaps in research still exist, and help point a way forward for future work on this issue. We also see this publication as a call to action—the report demonstrates that the time is now to instill better accounting measures in food and agricultural production. We can’t afford to wait. And we hope that the organizations we profile in the report will inspire all of us to demand that industry and governments make the production and policy changes necessary to prevent further environmental degradation. Business as usual is no longer an option.

By Danielle Nierenberg
President, Food Tank
Agriculture and the food system affect all aspects of the human experience. What producers choose to grow and what consumers eat impact the world, both today and in the future. According to Alexander Müller, Senior Fellow at IASS and former Assistant Director-General of the Food and Agriculture Organization of the United Nations (FAO) and, “agriculture is arguably the highest policy priority on today’s global political agenda, in recognition of its widespread impacts on food security, employment, climate change, human health, and severe environmental degradation.”

This nexus between agriculture and the economy, the environment, and society have spurred global interest at the highest levels for creating sustainable agricultural systems. Two of the 17 post-2015 sustainable development goals (SDGs), specifically address how agriculture can be beneficial and harmful.
In order to create sustainable food systems, producers, eaters, businesses, governments, and the funding and donor communities must understand how to quantify and understand the real costs of food. Advocates of the economic model known as True Cost Accounting (TCA) recognize that if we do not assess and account for everything that goes into producing and consuming food as well as the impact it has on people and the environment, we risk continuing on a path of damage to the planet and public health.

TCA, as defined by the Sustainable Food Trust, a United Kingdom-based organization, involves “identifying, categorizing, quantifying, and putting a price on the range of costs and benefits arising from different production systems and developing various mechanisms through which we can ensure that in the future, polluters will pay and those that are producing healthy and sustainable food will be better rewarded financially than those whose food production systems are damaging the planet and undermining public health.” The Lexicon of Sustainability, another civil society group, based in the United States, similarly defines TCA as “a practice that accounts for all external costs—including environmental, social and economic—generated by the creation of a product.”

TCA seeks to capture the whole cost of agriculture, going beyond the economic inputs required to produce food. It creates truly cost-efficient food production systems which examine how to do more with less, improve food production practices so they minimize harm, and create well-informed communities that understand, appreciate, and proactively account for the interconnectedness of food with health, environment, development, and prosperity. At the heart of our ability to successfully rise to the challenge of feeding the world is the need to account for the true costs of all inputs and outputs of agriculture—from plant to plate and from root to rubbish.

Achieving sustainability in agriculture and across the food system will not be easy. The FAO has recognized the challenges that agriculture faces in the 21st century, noting that “it has to produce more food and fibre to feed a growing population with a smaller rural labour force, more feedstocks for a potentially huge bioenergy market, contribute to overall development in the many agriculture-dependent developing countries, adopt more efficient and sustainable production methods and adapt to climate change.” With the spotlight placed on the hidden costs of our global food system and the innovation, evidence and scalable experiences needed to feed the world, now is the time to ensure that TCA takes center stage in food system and food security conversations in order to inform better policies and practices.

### TRUE COST ACCOUNTING: THE BUSINESS CASE

Neglecting to account for external costs can have a major impact on the world. The true cost of food, both real and hidden, is entirely and ultimately passed on to society, especially to the most disadvantaged in society. According to a 2013 report on the environmental impacts of business practices, the estimated economic impact of environmental externalities (such as greenhouse gas emissions, water use, pollution, and waste) is approximately US$4.7 trillion dollars each year. Who pays this cost? It is typically governments, who in turn pass the costs down to taxpayers.

The food sector is composed of businesses. As with any other economic sector, companies working in the food industry respond to the needs and preferences of consumers to ensure that there is a market for their goods and services. Many organizations have already begun to incorporate TCA (Appendix A).

For farmers, traditional balance sheets assess the costs of “inputs” such as fertilizers, pesticides, and antibiotics to grow and produce large-scale agricultural “outputs” such as corn, soybeans, chickens, or beef. However, traditional balance sheets have not accounted for the consequences of other system-wide inputs and outputs (known as “externalities” or the “hidden” costs of food production) including air pollution, water contamination, land degradation, and labor practices or some of the advantages, such as improved health and nutrition or the strengthening of local economies.

While consumers do not generally pay for externalities at the checkout lines of grocery stores or restaurants, they do pay for them through taxes for social and health programs, farm subsidies for commodity crops, pollution from pesticides and fertilizers and other agrochemicals, antibiotic resistance in humans and animals, depletion and contamination of natural resources, and loss of biodiversity. These indirect costs are “hidden” from consumers, but they are still paid for in tangible ways, and often distributed unfairly throughout society.

The idea of TCA is not new. In fact, the climate change movement has propelled TCA while advocating the importance of accounting for the impacts of our production and consumption practices on the environment. Climate change advocates also have worked to quantify both the investment in mitigation strategies and the impact of these strategies in order to push for changes in how business is conducted and consumers behave.

The intersection of climate change and agriculture has long been a focus area of the FAO. According to a 2013 report on climate change and livestock, the FAO found that livestock farming releases 14.5 percent of all human-caused greenhouse gas emissions and that by adopting improved methods and technologies such as improved breeding, improved grazing, high quality feed, and better animal health, livestock farmers could reduce sector emissions by 30 percent. However, some researchers postulate that the FAO overestimates the impact of livestock through selective inclusion of land use change, claiming that all types of land use change should be considered under a TCA model. The benefits of grass-fed livestock also create positive externalities that should be considered separately from indoor animal operations.

Assessing the positive and negative externalities that occur within agriculture and food production, allocating a monetary value to these externalities, and helping consumers understand the impact of those costs holds the promise of transforming how we produce, deliver, and consume.
what does
TRUE COST ACCOUNTING capture?

For food systems to improve, there needs to be an understanding of where and how the damage is occurring. TCA in agriculture principally helps us to understand the impacts, both positive and negative, that agricultural practices and food systems have on three areas: environment, society, and the economy. In addition to measuring the negative costs associated with food production, TCA can help account for positive impacts of the food system on communities, society, and environment. Ultimately, TCA models can lower the cost of food produced sustainably, while incorporating negative externalities into the retail price of “cheap” food.

ENVIRONMENTAL COSTS

Agriculture, no matter how sustainable or unsustainable, impacts the environment through “air and water quality, energy consumption, natural resources, solid and toxic waste, and land use/land cover.” Current food production, processing practices, and distribution systems are putting ongoing pressure on the environment and natural resources.

Industrial agriculture practices, such as monoculture crops (large-scale, single crops grown intensively) or concentrated animal feeding operations (CAFOs) (large number of animals in a confined space also known as factory farms) are known for using large concentrations of water, pesticides,
fertilizers, and for CAFOs specifically, water and air pollution from massive amounts of manure.

The FAO notes that “there is a need for policies, infrastructures and considerable investments to build the financial and technical capacity of farmers especially smallholders) to enable them to adopt climate-smart practices that could generate economic rural growth and ensure food security.” In 2015, the FAO launched a Family Farming Knowledge Platform, using participatory methodologies and practices that combine new technologies and research with farmers’ traditional and regional knowledge.

Developed countries are responsible for most of the global impact from industrial agriculture practices; however, these practices are also taking shape in the world’s emerging economies. For example, in Brazil, the clearing and tillage of land has resulted in incredibly high levels of soil erosion. An estimated 55 million tons of topsoil are lost every year, leading to reduced soil fertility and land degradation, as well as water pollution from soil runoff and greater chances of flooding because there is insufficient soil to absorb excess water.22 The cost of soil erosion in Brazil was estimated to be US$242 million per year in the state of Paraná and US$212 million per year in the state of São Paulo.23

While these negative impacts are mostly associated with industrial agriculture, smallholder farmers and those using non-industrial farming practices also face challenges such as: knowledge and technologies not reaching them; inefficient food production systems; and lack of resource-friendly approaches, including excessive water usage, lack of water conservation techniques, and over fertilizing. Whether large or small scale, these practices can lead to negative environmental costs, including soil depletion, soil erosion, chemical fertilizer runoff and waste, and add to global warming emissions, to name a few.

According to a FAO report, the aquaculture sector impacts the livelihoods of approximately 500 million people worldwide, most of whom are in developing countries. The adoption of more sustainable aquaculture and fisheries is critical because they contribute to both livelihoods and nourishment—fish “provides essential nutrition for 3 billion people and at least 50 percent of animal protein and essential minerals to 400 million people in the poorest countries.”24 Furthermore, the World Bank and FAO estimate that economic losses in marine fisheries due to poor management and overfishing account to US$50 billion per year.25 These stocks are currently in jeopardy due to over-fishing, poor management practices, and human-caused impacts, with the WWF estimating the costs of illegal fishing to be US$10-23.5 billion annually.26
Since 1977, the Egyptian organization SEKEM has been focused on harnessing, safeguarding, and reducing the use of water that is available in Egypt. With 95 percent of Egypt’s water coming from outside its borders, food producers face considerable agricultural challenges.

Through employing many advanced practices to safeguard and reduce water consumption, including biodynamic farming, drip irrigation, natural wastewater treatment, and wastewater reutilization, SEKEM is able to face these challenges head on and oversee the production, distribution, and exportation of organically grown crops in Egypt.

Biodynamic farming—the method employed by SEKEM—is a “holistic understanding of agricultural processes,” treating the farm as one interrelated, living organism. Using biodynamic farming methods, SEKEM is mitigating negative farm production costs and increasing their positive environmental and economic footprint through water management, increasing biodiversity, and improving the structure of the soil – resulting in increased crop yields.

With an emphasis on biodynamic agriculture, holistic education, and research, SEKEM has become a leader in education, entrepreneurship, and sustainability. SEKEM believes that collaboration with international advocacy groups such as the World Economic Forum and U.N. Development Programme, and collaboration with partners that shape the organic food market such as large European customers and certification bodies like Fair Trade, the hidden costs of conventional agriculture can be revealed and we can begin sharing the benefits of organically grown produce for a sustainable, healthy world.
In Estero Real, Nicaragua, improving environmental management methods, generating alternative livelihoods, improving governance, and capacity building allowed fish farmers to generate more income and a source of food while also preserving a delicate resource. Through these sustainable practices, fish farmers are not only creating positive externalities by protecting the fish and the ecosystems they inhabit, but also ensuring that they have access to this vital source of income and nourishment for years to come.

Only 3 percent of our world’s water is fresh, making better protection and management of water resources critical, as many large food-producing countries are reaching their resource limits on renewable water. Additionally, other countries around the world are reaching alarming levels of water scarcity. The food and agriculture sectors use 70 percent of the world’s available water for irrigating crops, as a drinking source for animals, and the production and transportation of food. There are even greater stresses placed on the water supply through the use of fertilizers and pesticides, which generate enormous cleanup costs.

According to a 2012 OECD (Organisation for Economic Co-operation and Development) report, “groundwater depletion may become the greatest threat to agriculture,” and farm runoff nutrient pollution through fertilizers and pesticides is expected to worsen, further harming aquatic life and increased algal blooms, which reduce the oxygen in water leading to a reduction in biodiversity in the water source.

The WWF stated that “the main causes of wasteful and unsustainable water use are: leaky irrigation systems, wasteful field application methods, and cultivation of thirsty crops not suited to the environment. The problem is made worse by misdirected subsidies, low public and political awareness of the crisis, and weak environmental legislation.” These unsustainable water uses can lead to depletion and pollution of water sources, and “excessive irrigation can also increase soil salinity and wash pollutants and sediment into rivers—causing damage to freshwater ecosystems and species as well as those further downstream, including coral reefs and coastal fish breeding grounds.”

Food waste also contributes to environmental concern. According to a 2013 FAO report Food Wastage Footprint: Impacts on Natural Resources, globally we waste approximately 1.3 billion tons of edible food each year with direct economic consequences of approximately US$750 billion annually. This amount of food lost or wasted each year equals about 28 percent of the world’s agricultural land in use and has a blue water (fresh surface water and groundwater) footprint of 250 km². It also comes with a hefty carbon footprint, releasing 3.3 billion tons of carbon dioxide into the atmosphere annually.

Other key environmental impacts include the loss of biodiversity, particularly of pollinating insects, as a result of pesticides and monoculture cropping. It’s estimated that US$520 million worth of crop loss is attributed to pesticide use, due to the elimination of natural pest predators. The loss of pollinators in particular has a huge economic impact on agriculture, which has been estimated by researchers such as David Pimental.

Soil erosion and degradation of fertile topsoil also generate enormous negative environmental externalities on the global scale. Estimates of the cost of soil erosion in the United States range from US$100 million to US$44 billion per year. Worldwide, there is only enough topsoil left to grow food for another 60 years. However, the opportunities to improve adoption of conservation practices (such as cover cropping, conservation tillage, and crop rotation) within both industrial and small-scale systems are huge. According to United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) studies, the total cost of preventing one ton of soil erosion is US$7.03 per acre, but farmers that participate can save society US$42.40 per acre in water quality improvement costs.

**ECONOMIC COSTS**

The costs of food production are “variables that deal with the bottom line and the flow of money, [such as] income or expenditures, taxes, business climate factors, employment, and business diversity factors.” Agricultural subsidies (a government subsidy paid to farmers to supplement their incomes) are an incredible economic expense. In the U.S., subsidies and insurance for farmers cost taxpayers an astounding US$20 billion each year. The European Union spends 43 percent or EU€58 billion on agriculture subsidies and related programs through the Common Agriculture Program (CAP). Subsidies are important mechanisms of support for farmers, but they prop up a system that allows for negative externalities, representing the flip side of taxes that consumers pay to clean up the environment, repair health problems caused by food production, and compensate for low wages through government support.
WHAT DOES TCA CAPTURE?

In the U.S. and in other industrialized countries, these subsidies are predominately going to industrially grown commodity crops, such as corn and soy. To bring about TCA, subsidies should be redirected toward sustainable farmers that minimize negative externalities. Annual agricultural subsidies in the U.S. for commodity crops such as corn and soybeans are US$3.52 billion and US$1.56 billion, respectively, while all fruit and vegetable subsidies are only US$0.37 billion. Subsidies to commodity crops, which pave the way to cheap processed foods and meat, have been linked to weight-related non-communicable diseases, including heart disease and diabetes. According to the Union of Concerned Scientists if Americans consumed the USDA recommended levels of fruit and vegetables, it would result in a savings of more than 127,000 lives and US$17 billion in health care costs each year, with a total economic savings as high as US$11 trillion.

Farm subsidies in developed countries can also have another negative impact—undermining small family farmers in developing countries. Subsidies in industrialized nations often “lead to overproduction of certain crops in developed countries, causing prices to fall, sometimes below the cost of production. Oxfam International notes that the more than 10 million people in Central and Western Africa countries who rely on the production and sale of cotton lose up to US$250 million every year due to foreign subsidies.”

Liselotte Schäfer Elinder of the Swedish National Institute of Public Health argues, “the use of export subsidies by rich countries and tariffs on imported food is a serious obstacle for growth of the agricultural sector in developing countries.” Stunting the growth of the agriculture sector has grave implications for broader social impacts. Agricultural growth can play an important role in poverty alleviation as well as reducing malnutrition because it increases the availability of food, creates more jobs, and reduces the cost of food for poor consumers. When agricultural growth occurs for sustainably produced foods, these outcomes can be achieved at lower impact to human health and the natural environment through TCA.

In their efforts to address hunger and poverty, “governments have sought to increase food production to ensure the provision of low-priced food to the growing number of urban poor. And they have seen importing subsidized foods dumped on the international markets as a desirable option, despite its impacts on local food producers and the heightened vulnerability this creates for net-food-importing countries due to increasingly volatile prices. This narrow focus on ensuring food availability, understandable though as it is, also encouraged the development of large-scale, industrial modes of production that perhaps fit the requirements of the dominant low-cost food economy, but which result in considerable social and environmental externalities that are not accounted for in the price of food. This is the impasse that we now face.”

SOCIAL COSTS

The social costs of food generally receive the least amount of attention. Social costs “refer to social dimensions of a community or region and could include measurements of education, equity and access to social resources, health and well-being, quality of life, and social capital.” Within this report, health costs are discussed separately in the next section, due to increasing political attention on the impacts of the food system on nutrition, occupational health, and wellbeing. How the food system functions plays an integral role in our lives—on health, wellbeing, workplaces, culture, and communities. Both positive and negative costs are attributed to practices along the food supply chain, leaving numerous footprints including wage depression, a lack of worker’s rights, and numerous other social impacts.

The loss of small family farms and the decline of rural communities leads to social costs that are difficult to quantify. Employment derived from agriculture, skills and knowledge, and cultural issues such as the importance of farming for identity and tradition are not often included in cost analyses. Agriculture has historically contributed to the beauty of the landscape, which plays a role in art, literature, national heritage, the emotional connection between people, animals, and the land. This impacts the public perception of farming and nature, which can still be seen through food marketing and branding. The loss of small farms through the industrialization of the food system therefore creates cultural externalities that are difficult—if not impossible—to quantify through economic models.

Other social costs are more easily measured. In the U.S., many fast food workers more often live in or near poverty. According to a report from the UC Berkley Labor Center, because of the low wages that they receive from their employers, more than half of those receiving public assistance are fast
WHAT DOES TCA CAPTURE?

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HEALTH COSTS

By 2030, it is estimated that there will be an additional 3 billion middle-class consumers. They will put pressure on already increasing demands for protein products, especially meat and eggs. According to the TEEB business externality report, added pressures from the middle income bracket will put “consequences in the form of health impacts and water scarcity that will create tipping points for action by governments and societies. The cost to companies and investors will be significant.”

Obesity, excess weight, and its consequences can lead to a multitude of health and economic issues including cardiovascular disease, diabetes, reduced productivity at work, loss of income, higher insurance premiums, medical costs, and more. The comparative low price of processed foods (resulting in higher consumption) versus fresh fruit and vegetables is only contributing to the crisis. For example, a 2014 report by the McKinsey Global Institute says that approximately 30 percent of the global population is overweight or obese, with a global economic impact amounting “to roughly US$2 trillion annually, or 2.8 percent of global GDP.”

Antibiotics used excessively in agriculture to accelerate animal growth and prevent disease outbreaks that occur in overcrowded conditions are a health threat to people and to the very animals that they are used on. Non-therapeutic use of antibiotics in animals has been found to cause antibiotic resistance in people. Overuse of antibiotics on farms and over prescription to humans by doctors is expensive and has serious ramifications for the future. According to Sustainable Food Trust Policy Director, Richard Young, “the true cost of antibiotic resistance is approximately £10 billion a year in the UK and US$55 billion a year in the U.S.”

Other major health externalities include pesticide poisoning and links to neurodegenerative diseases; ammonia in the atmosphere affecting people’s lungs; nitrous oxide emissions deplete the ozone and potentially leading to skin cancer; nitrates in drinking water are converted to nitrites in the body which can cause colon cancer and other problems; and food poisoning caused by lack of care taken during production processes. Endocrine-disrupting chemicals found in pesticides are estimated to cost the European Union €157 billion (US$209 billion) in actual health costs and lost earnings per year, due to their linkages to cancer, birth defects, infertility, and learning disabilities.
True Price, a Dutch social enterprise, works with governments, multinational corporations, NGOs, and others, to make sustainable decisions about the way they do business. True Price quantifies and valuates the economic, environmental, and social impacts of groups through metrics such as biodiversity loss, pollution, water use, child labor, or health risks. Armed with this vital information, organizations can then use it to reduce their negative impacts and account for their positive ones—facilitating innovation and changing the way business is done.

In 2013, Dutch chocolate brand, Tony’s Chocolonely, worked with True Price to understand where they stood on the sustainability spectrum and identify where they were leaving a negative environmental and social footprint. Tony’s goal was to become a 100 percent sustainable company by 2019 through eliminating all negative environmental and social costs in their supply chain. While Tony’s was already environmentally and socially aware, the collaboration with True Price enabled the company to identify where and how they could improve and make changes, including improving healthcare and education and increasing pay for farm workers.

True Price is also facilitating multisectoral collaboration through their True Price Platform. The Platform is a hub where companies, academia, governments, and others can share information and best practices on their environmental, social, and economic impacts. Through increased transparency and the impacts of organizations known internally and to those they serve, greater decision making and risk assessments can be made.
WHAT DOES TCA CAPTURE?

Pesticides endanger human health through direct exposure, release into the environment and residues on food. A study by Erin Tegtmeier and Michael Duffy from Iowa State University claims that the cost to human health from pesticides used within the U.S. in crop production is approximately US$1 billion annually. Pesticides produce both short- and long-term effects on human health. According to the WHO, pesticide poisoning affects 3 million people and accounts for 20,000 unintentional deaths a year. It is estimated that 99 percent of pesticide deaths occur in developing countries, despite these nations using only 25 percent of the global volume of pesticides. These figures, as troubling as they are, do not capture the long-term effects that pesticide exposure can have on people’s health and long-term productivity. For example, sugar plantation workers in Nicaragua, a country with less stringent pesticide management practices, are facing serious health complications including chronic kidney disease.

ACCOUNTING FOR POSITIVE IMPACTS

As more attention focuses on the social responsibilities of companies and businesses, TCA can be a way of going beyond the costs and expenditures associated with food production. TCA is a model that can help businesses avoid negative externalities, while also helping them quantify and promote positive impacts, including efforts that support local economies, technologies that minimize environmental damage, and mechanisms that build sustainable food systems from farm to fork.

Taking the steps to become more sustainable can be an excellent return on investment for companies, both small and large. In a report by TruePrice, Unilever introduced a new product, Unox Free Range Sausage, that is “produced under more animal-friendly conditions and its environmental impact is 20 percent less than an average smoked sausage.” With more sustainable production methods, the company saw increased customer approval, an uptake of sales, and an improvement in the living conditions of 500,000 animals. Companies like Niman Ranch are working with family farms in the U.S. to provide restaurant chains like Chipotle with antibiotic-free, humanely-raised pork.

In addition, mechanisms that recognize, measure, and monetize costs of food production can help businesses, consumers, and policymakers to make decisions about the scaling up of sustainable products and who will bear those costs.

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Table 1: Externalities in the Food System

Outputs or externalities of the food system can be either positive or negative, depending on the type of production or processing methods. Examples of externalities in the food system include:

- Air pollution
- Animal welfare
- Antibiotic resistance
- Biodiversity loss
- Child labor
- Climate change
- Deforestation
- Foodborne pathogens
- Greenhouse gas emissions
- Healthcare costs
- Land use
- Obesity
- Soil erosion
- Subsidies
- Taxes for welfare and social services
- Waste
- Water pollution
- Workers’ rights
the benefit of scaling up
TRUE COST ACCOUNTING practices

**True Cost Accounting (TCA)** can increase knowledge and awareness of how the food system is impacting the planet’s environment, resources, and health, resulting in a more transparent, accountable, and sustainable food system. It also helps make agroecological farming desirable at scale, while discouraging practices that are harmful to human and environmental health.

**ENCOURAGES BETTER DECISION MAKING**

Organizations and initiatives such as TEEB, TruePrice, Natural Capital Coalition, and others, are helping guide governments, businesses, and even consumers to recognize their footprint and their role in sustainable agriculture.

With an understanding of a company’s dependence on natural resources and the impact it has on those natural resources and society, a company can create a business model that not only responds to consumer demand for more sustainable food systems, but that also changes practices to minimize negative externalities and promote positive ones.

For example, deforestation as a result of unsustainable cultivation of palm oil accounts for nearly 15 percent of global greenhouse emissions. By 2020 Unilever has committed to source 100 percent of their agricultural raw materials sustainably, placing particular emphasis on the sustainable
sourcing of commodities like palm oil.”66 As one of the world’s largest purchasers of palm oil, Unilever has the opportunity to make a huge impact.67 Understanding the value of natural capital provides a platform to help “improve business decisions on risk management, supply chain sourcing decisions, new markets/investments, saving costs, sustaining revenues and environmental performance.”68

With a more accurate picture of the external costs of our food system, governments and policymakers can redirect and/or impose appropriate subsidies, incentives, and taxes to farmers and producers;69 require increased transparency in how our food is produced and integrate TCA into policies and procurement mechanisms.70 According to Olivier De Schutter, former U.N. Special Rapporteur on the right to food, “governments have few sources of leverage over increasingly globalized food systems – but public procurement is one of them. When sourcing food for schools, hospitals and public administrations, governments have a rare opportunity to support more nutritious diets and more sustainable food systems in one fell swoop.”71

Informed consumers can also change their food buying, consumption, and waste habits. Consumers increasingly want to understand how and where their food was produced so that they can make more informed purchasing decisions. When purchasing products in the U.S., 77 percent of families take into account the product’s sustainability, including if it is locally produced, whether it comes in sustainable packaging, if it is humanely raised, whether it is non-GMO, and if it protects or renews natural resources.72 In China, because many middle class consumers living in urban areas distrust the safety and quality of conventional foods, alternative food options are emerging, including community supported agriculture (CSA) subscription services, cooperatives, mobile markets, farmers’ markets, and pick-your-own farms.73

Table 2: True Cost Accounting Has the Potential to:

- Improve profitability
- Reduce risk and liability
- Improve employee health and morale
- Lead to better decision-making
- Highlight opportunities for cost savings
- Identify opportunities for new processes
- Uncover opportunities for new products and services
- Add competitive advantage
- Improve stakeholder relations
- Improve internal and external reports
- Lead to more accurate and complete pricing
- Provide value to the community and society at large
- Offer environmental benefits at the local, regional, and global levels
Seed Capital KY, a nonprofit organization created to catalyze the success and resilience of Kentucky's regional agriculture and regional food economy, is behind the creation of the West Louisville FoodPort. The goals of the FoodPort are broad, and include supporting community and economic development, facilitating growth of area businesses, and increasing farmers’ incomes, all while bringing down the cost of local, sustainable goods and addressing the lack of available fresh food.

The FoodPort in Louisville will transform a 24-acre area into a seed-to-waste food chain where food is grown, harvested, processed, sold, eaten, and even disposed. It will also provide opportunities for members of the Louisville community have a chance to work, learn, nourish, commune, and invest in their own futures and that of their city. In an effort to minimize the environmental footprint of the complex, a biodigester, or anaerobic digester, will be onsite to turn all organic waste from the FoodPort and surrounding businesses and homes into energy.114

A “unique” concept, the FoodPort will include “businesses along the local food supply chain in a collaborative model, leveraging the assets of each to gain scale and efficiency in aggregating and distributing local food, while also allowing each of the businesses to focus on its individual operations, goals and objectives.”115

It may be a good idea to also include case studies showing more specific examples of TCA. For example, by looking at the production of a particular product (e.g. a chicken), everything that goes in to producing it and the positive and negative costs this can have. Or by showing where changing one production practice can re-direct financial costs in a way which improves the sustainability of that system – for example, monoculture production of wheat results in soil being eroded and washed into rivers and streams. This costs government and taxpayers a lot of money to clean up. If instead, this money was paid to the farmer to practice mixed agriculture which prevents soil erosion, then the farmer will be able to afford to farm sustainably, the environment will not be affected, and the tax payer will be supporting sustainable farming instead of paying for the damage done by bad farming practice.
LEVELS THE ECONOMIC PLAYING FIELD

By allocating monetary values on the social, environmental and health impact of farming practices, TCA makes visible the real cost of food production, and works toward a more fairly priced food system by leveling the playing field. TCA can also contribute to education and awareness throughout the food system through multimedia and informational tools.

Increased transparency through TCA can lead to easier comparisons between different businesses, products, and processes, and can increase innovation and competition. For example, Whole Foods, a U.S.-based grocery chain, has taken several steps to ensure that through their food standards are “encouraging and rewarding producers to create safer and more sustainable food.”

Oxfam International’s Behind the Brands initiative calls for increased transparency and accountability for social and environmental risks by the 10 largest food companies. For example, after shedding light on the poverty level and gender pay gap of cocoa farmers in countries such as Nigeria, Oxfam, with the help of consumers, successfully urged the largest chocolate companies (Mars, Nestlé, and Mondelez) to make policy changes for gender equality.

IMPROVES THE HEALTH OF THE PLANET

Using the TCA framework, all actors along the food supply chain can understand what their current impacts are and use that information to drive better practices and correct the global obesity epidemic, soil erosion, climate change, water and air pollution, collapse of fisheries, loss of pollinators, and so forth.

The Kenyan Constitution, recognizing the vital importance of Kenya’s forests for economic development, tourism, water catchments, and retention of biodiversity and wildlife, set a requirement for a minimum of 10 percent tree coverage. Kenya is also further protecting its natural resources through the country’s economic blueprint, Vision 2030, which “aims to protect the five major water catchment areas (Mt. Kenya, Aberdares, Mau, Cherangani and Mt. Elgon) and increase the forest cover to 10 percent through an aggressive afforestation, reforestation, and restoration program.” These initiatives have generated positive environmental externalities and involved farmers in reforestation.

An unprecedented loss of pollinators around the world is threatening the world’s food supply because of their critical role in the pollination of plants and crops. Honeybee populations have been declining for years in a phenomenon known as Colony Collapse Disorder (CCD), in large part due to neonicotinoids. A recent study found that if pollinators disappeared, more than half of the people in developing countries would be at risk for malnutrition. In Mozambique, for example, where there are already high levels of food insecurity, “the disappearance of pollinators could push as many as 56 percent of people over the edge into malnutrition.” Companies are beginning to do their part to reverse the trend for bees. U.S. companies Lowe’s Cos Inc, BJ’s Wholesale Club, and Home Depot, for example, are all making moves to stop selling and remove neonic pesticides from their products.

Governments, companies, farmers, and consumers – we all have a role and stake in the health of our world. Through understanding the impact of our actions we can transition to using sustainable practices that will get the most out of the land and be profitable, while also preserving and improving the health of soil, water, and local ecosystems.
Integrating the true costs of foods into the food system requires overcoming a number of barriers and it will take everyone from farmers to policymakers to companies to consumers to be active in that change.

ALIGNMENT ON WHAT SHOULD GO INTO TRUE COST ACCOUNTING

Despite the more recent momentum around the need to account for all costs associated with food production, there remains a lack of consensus around defining “sustainability” and “societal costs” associated with farming and food production. TCA is not the only terminology used to describe the practice of accounting for all costs associated with production of a product. Similar terminologies include Triple Bottom Line (TBL), Full Cost Accounting (FCA), Life Cycle Analysis (LCA), Natural Capital Accounting (NCA), and Cradle to Cradle (C2C).
Some methods of accounting for positive and negative costs only consider environmental impacts, while others also integrate social and public health impacts. The numerous externalities involved with food production make it incredibly difficult, if not impossible, to study and quantify their costs.

In order for TCA to provide meaningful information, the same methodology or approach needs to be implemented across products. This poses many challenges since production of different food categories (e.g. vegetables vs. meat, processed food vs. fresh food) varies significantly.

In addition, there is a need for standardized data collection methods across producers, states, and nations. According to the Natural Capital Coalition, the “lack of a harmonized framework” and lack of consistency on how to “value natural capital and apply it in business decision making” makes creating a sustainable business model incredibly difficult.

ASSIGNING MONETARY VALUE

There are differing opinions on the idea of assigning monetary value to “natural capital.” Some are concerned about the commodification of nature, as they are afraid that by monetizing nature its intrinsic value would become lost and could lead to trade-offs, such as weighing deforestation against profit.

Assigning monetary values to social and environmental costs analogous with economic costs is also a challenge, as well as differentiating the effects
of past emissions from those of future emissions on the ecosystem. On the supply chain side, in order to accurately assess the “true cost” of the food system, there needs to be a better understanding of all aspects of the supply chain in food production, as well as ecological processes associated with farming activities. For farmers to be economically viable, they need to be guaranteed a fair price for their products by retailers and supermarkets that have previously manipulated prices. Large buyers have disproportionate pricing power, placing small family farmers at a disadvantage and driving farmers out of business in some cases.

EXTERNALITIES AND BUSINESSES’ BOTTOM LINE
Having a profitable and sustainable business can go hand-in-hand. However, as businesses work towards becoming more sustainable, they will have to account for all aspects of their business practices—from the treatment of employees, to preserving natural resources, to being a good steward in the communities where they work. In the end, businesses must be profitable to survive. Demonstrating how businesses can maintain or even improve profitability while also acting socially and environmentally will be more effective in transforming practices.

GAPS IN RESEARCH
Few people realize the extent of the problem in the food system because of the lack of scientifically verified/credible data that is needed to put a price on the damage caused. Activists, such as Patrick Holden from the Sustainable Food Trust, have highlighted the potential public health crisis that might result from current food production methods. “There is a ticking time bomb in the form of a public health crisis related to food and the current, predominant approach to food production and consumption. To date this has only been recognized in relation to obesity and type-2 diabetes, and even then only at the most simplistic level. But there is an emerging body of scientific evidence linking agriculture’s dependence on nitrogen fertiliser, the endocrine disrupting chemicals used in some pesticides, and the profligate use of antibiotics in intensive livestock systems, to a wide range of negative health outcomes, including cardiovascular and respiratory diseases, intestinal disorders, cancers, allergies, weight gain and resistance to potentially lifesaving drugs in human medicine,” says Holden.

CONSUMER UNDERSTANDING AND EMPOWERMENT
The present food pricing system is sending distorted messages to both producers and consumers about the true cost of food and benefits of food production systems. As long as this remains in place, it will be more or less impossible for sustainable food systems and farming to go mainstream. Changing the fundamental way that consumers think about and purchase food is crucial.

For example, Seed Capital Kentucky found that consumers want to buy sustainably, but they “are wired to purchase the cheapest product.”
That cheapest product however, is only inexpensive because it does not account for the external costs that made it possible, such as damage to the environment, to workers, and to our health. For organic agriculture, 70-80 percent of consumers are buying organic because of health reasons, not because of the environment. Unless we look at these costs in a holistic manner – social, environmental, and economic – there will always be shortcomings.

Understanding consumer motivations is key, as businesses must understand what matters to consumers and how that affects their willingness to pay for products that have a friendlier footprint on our planet. Purchasing “sustainable food must fit into people’s everyday lifestyles (i.e., must be “feasible,” available, affordable, and accessible) and should allow for sociocultural diversity.”

**BEARING THE COSTS**

Once the true cost of food is determined, the next major challenge is determining who will bear the cost of the externalities. Opponents to TCA argue that it would lead to an increase in food prices or require tax increases to support policy initiatives. However, Patrick Holden from the Sustainable Food Trust suggests that TCA, by supporting a food production system that is more sustainable, localized, and less resource intensive, would actually help avoid food price hikes in the future.

Currently, the costs of food are increasingly shifting towards the pockets of taxpayers. Low wages paid by some of the most profitable businesses in the U.S., including Walmart and McDonald’s, cost taxpayers approximately US$153 billion a year in government assistance programs, with US$126.7 billion of that from SNAP. Approximately 73 percent of those enrolled in federal assistance programs are from working families, meaning “the taxpayers bear a significant portion of the hidden costs of low-wage work in America.”

These costs are not only a burden to taxpayers, but are less effective at alleviating poverty than raising wages. Recent citizen and labor movements to increase the minimum wage have focused directly on the food and agricultural sectors, including the Fight for $15 movement targeting the American fast food industry and the Fair Food Campaign targeting supermarkets and fast food chains in the United States.

#Fightfor15 is a national campaign working for a US$15 minimum wage and unionization for workers in the fast food industry. By targeting low pay, the campaign is contributing TCA by eliminating social externalities caused by poverty wages. According to the campaign, two-thirds of fast food workers are supporting a family on average yearly wages of US$16,920. The campaign is gaining national attention and quick success; a Fast Food Wage Board appointed by New York Governor Andrew Cuomo announced a plan to increase fast food workers’ wages incrementally across the state, representing a major victory for labor organizers and food justice champions. The US$15 minimum will be achieved in New York City, NY by 2018 and the rest of the state by 2021, applying to establishments with more than 10 workers.

Research on the effects of minimum wage increases on fast food prices has focused on employment, actual wage increases, and price changes. In general, mandated wage increases in competitive sectors such as the fast food industry tend to lead to higher prices paid by consumers. One study by Purdue University found that a national doubling of fast food workers’ wages would result in a 4.3 percent increase in the price of fast food, and another found that prices of McDonald’s hamburgers and KFC chicken rose by approximately 1.5 percent after minimum wage was increased by 10 percent. However, price changes were unrelated to mandated wage increases in Texas in one longitudinal study. The effect of minimum wage on employment depends on the level set as the minimum; the effect could be neutral or could cause lower employment if set too high. This is a challenge faced by policymakers. In terms of TCA, mandated wage increases help to ensure that prices paid by consumers include the real costs of cheap labor and provide economic security for low-skilled laborers.

Better coordination among research institutions, state departments, economic researchers, producers, and farmers is needed to rebalance the cost bearing of food in order for TCA to be employed. These entities can establish new relationships and cooperate on issues despite their different interests. The Natural Capital Coalition, for example, implemented the Natural Capital Protocol to bring together actors to provide a framework that will help businesses in their decision-making processes.
scaling up

TRUE COST ACCOUNTING practices: a call to action

To have a food system that not only feeds the world’s growing population, but also minimizes the damage to the environment, to health, and to the economy, we will need to prioritize our actions and identify where all actors along the food chain can play a role in addressing this global challenge. According to TEEB, “there is also the potential to mitigate emissions across the entire food system, most obviously in terms of developing infrastructure and information to reduce food waste, but also across the entire life cycle of production such as energy use in the production of fertilizers, emissions from manure, etc.”96 Below, Food Tanks provides suggestions for what everyone involved in the food chain can do to mitigate the damage.

BUSINESSES AND NON-FOOD PRODUCERS
The B Team, a global nonprofit led by business leaders, believes that in order for businesses to survive and thrive, “the private sector can and must redefine both its responsibilities and its own terms of success; a Plan B for concerted, positive action that will ensure business becomes a driving force for social, environmental, and economic benefit.”97 The B Team’s 10 challenges to businesses include valuing diversity, scaling true cost accounting, restoring nature, reinventing market incentives, and creating thriving communities.

Businesses are responsive to the demands of their consumers; and those demands, along with civil society advocacy, are pushing companies to make changes to their product lines, policies, and actions. For example, Chipotle is going GMO-free, citing concerns over the impacts on the environment, farmers, animals, and their customers. McDonalds and Chick-fil-A are going antibiotic-free, and because of concerns around antibiotic-resistance, Tyson’s will be eliminating human antibiotics in its chicken supply by 2017.98 Wal-Mart is partnering with Wild Oats to offer more organic selections, and bring down the price of organics.99 Because of the sheer force and size of these companies, they can change the way our food system works.

As the world transitions to the Sustainable Development Goals (SDGs) in 2016, the Global Reporting Initiative (GRI), U.N. Global Compact (UNGC),
and the World Business Council for Sustainable Development (WBCSD) are partnering to “develop private sector guidance that will help companies enhance their sustainability management and reporting with a view to global sustainable development goals and targets.” Getting businesses to look beyond the short-term benefits of profit to the long-term economic, social, and environmental consequences is a step that needs to continue to be taken.

**CIVIL SOCIETY**

Civil society groups, such as the Sustainable Food Trust, Union of Concern Scientists, TEEB, Natural Capital Coalition, and others, are instrumental in educating consumers, companies, governments, and other civil society members about the impact that TCA can have on our food system, health, and world. Civil society groups advocating for TCA practices must make the message clear and easy to digest so that business, policy, and community members can act. Civil society groups must provide concrete tools and experiences to enable the kind of specific action that is needed.

**CONSUMERS**

The voice of consumers is powerful. Improved transparency will empower consumers with the ability to choose products that are sustainable. With accurate information and the right tools, consumers can be encouraged to move away from the dominant expectation of fast, easy, and cheap foods, and toward foods that align with their value systems.

With increased knowledge about food products, consumers can make more informed decisions. As noted previously, it can also lead to consumers demanding that companies source foods ethically and with more transparency. With this, we must also understand what the threshold is for consumers’ ability and willingness to pay for food, particularly if they know that the food is produced and distributed sustainably, and the effect that has on society and our planet. When creating TCA solutions, food access and assistance to impoverished and malnourished consumers is vital to ensuring improved social and health outcomes for all citizens.

**FOOD PRODUCERS**

Farmers are ground zero of food production. Perhaps one of the greatest challenges for farmers, particularly those who operate sustainably, is determining an appropriate scale for their businesses operating at their full capacity.

Because of the nature of their businesses, it is incredibly difficult to become sustainable when having to take on the jobs of farmer, marketer, distributor, and packager. Through revealing the “hidden costs” of food production that are not currently reflected by food prices, farmers will be able to better identify areas where they can reduce costs and use of agricultural inputs such as water and fertilizer usage.

The TCA process can unveil bottlenecks and inefficiencies within a particular farm or product’s production process and reveal leverage points or areas of low hanging fruit for improvement. Large corporations and agribusinesses can also use TCA to evaluate the food supply chain and identify areas where there is waste or high costs. In addition to being able to make sustainable changes, those farmers and food producers that are environmentally and economically friendly should be rewarded for those efforts through pricing mechanisms.

**FUNDERS AND DONORS**

Bilateral, multilateral, and philanthropic donors are increasingly prioritizing and funding agricultural projects. Focusing donor and funder efforts on agricultural – specifically sustainable agricultural practices – is an incredible opportunity to create unprecedented gains for the environment, global economies, and the health of world’s people and animals.
Monoculture—the cultivation of a single crop in a given area—allows farmers to industrialize their production systems. According to the U.S. Department of Agriculture’s (USDA) Farm Service Agency (FSA), approximately half of farmland in the United States is planted with corn or soy, accounting for about 150 million acres. Planting just one or two crops may decrease labor costs, but results in externalized environmental, social, and health costs.

According to the USDA Natural Resource Conservation Service (NRCS), total soil losses from erosion on agricultural land occur at about 13 tons per hectare annually, and represented about 1.725 billion tons as of 2007. In the same year, 28 percent of all cropland was eroding at rates above the soil loss tolerance rates that are considered acceptable. USDA-NRCS studies estimated that 2.32 pounds of nitrogen and one pound of phosphorus were lost for each ton of soil eroded, costing farmers US$0.63 and US$0.64, respectively, in 2012. However, an economic benefit of US$4.93 per ton could be obtained from improving water quality through better soil management. Diversifying farms is one way to prevent erosion and maintain soil quality.

Monoculture systems dominate the agricultural landscape of the U.S., contributing to a large portion of this erosion as single cropping systems degrade soil and reduce tree cover. However, the opportunities to improve adoption of conservation practices—such as cover cropping, conservation tillage, and crop rotation—within monoculture systems are huge. According to USDA-NRCS studies, the total cost of preventing one ton of soil erosion is US$7.03 per acre, but farmers that participate in conservation programs can save society US$42.40 per acre in water quality improvement costs.

To grow just one or two crops on the same land, farmers also rely on heavy fertilizer inputs. Patrick Holden, founding director of the Sustainable Food Trust, explained the true cost of fertilizer use at the 2015 Food Tank Summit: “One ton of ammonium nitrate costs a U.S. farmer about US$387. The benefit to the farmer is between US$666 and US$2,666 per U.S. ton, but the negative costs—the damage to the environment, pollution, human health, depletion of natural capital—are between US$990 and US$5,172 per U.S. ton of ammonium nitrate. So in other words, if the damage done was charged to the farmer or the nitrogen fertilizer manufacturer, it would completely cancel out the business case for using it and transform agriculture all over the world, but that’s not happening.”

Furthermore, monoculture relies on pesticides to control weed and insect populations. However, pesticides also reduce beneficial pollinator populations. It’s estimated that US$520 million worth of crop loss is attributed to pesticide use, due to the elimination of natural pest predators. Health costs of pesticide application are estimated to be US$1.1 billion per year. Glyphosate, a broad-spectrum herbicide commonly used in monoculture systems, was declared by the World Health Organization (WHO) in 2015 to be a probable carcinogen. These costs are disproportionally caused by monoculture due to the higher use of pesticides within systems that lack crop diversity.

But it’s possible to rein in these external costs and reduce the harm to our health and environment, without abandoning farmers who are already struggling to make ends meet. Diversified systems reduce the yield gap between organic and conventional systems, and restore valuable ecosystem services, reducing farmers’ input costs and offsetting externalities. According to a study published in PeerJ by Dr. Harpinder Sandhu, the global net value of ecosystem services could exceed fertilizer and pesticide costs, even if used on only 10 percent of the global arable land area. And the USDA Risk Management Agency (RMA) is set to add up to 40 new crop types to insurance plans for 2016. By diversifying diets and supporting local farmers, consumers can “vote with their forks” to support more diverse agricultural operations that prevent the externalized costs of monoculture.
The world’s largest industry, employer of more than 1 billion, and generator of more than US$1.3 trillion dollars each year is agriculture. One of the largest funders of agriculture programs in the world, The Bill and Melinda Gates Foundation claims it is working to foster sustainable agricultural practices through “encourage[ing] farmers to embrace and adopt sustainable practices that help them grow more with less land, water, fertilizer, and other costly inputs while preserving natural resources for future generations.” The Global Alliance for the Future of Food, which includes the McKnight Foundation, Grace Communications Foundation, and several others, hopes to increase funding for more awareness about the importance of TCA.

**Investors**

Foundations and large donor networks are not the only groups that can leverage finance to account for true costs in food and agriculture and foster more resilient local food systems. Across the globe, Internet connectivity and policy changes are opening up investment to larger groups of people at smaller funding amounts through microfinance, crowdfunding, and food-specific lending.

Slow Money, a network of investors and entrepreneurs seeking to grow local food economies, is facilitating effective funding of food projects through collaborative knowledge and mutually reinforcing relationships. As a national movement in the U.S., Slow Money ensures that everyone can participate in investing in sustainable local food systems, not just wealthy investors. Overall, Slow Money has invested more than US$40 million in local food enterprises and organic farms since 2010, recognizing that crowdfunding for sustainable farming can create resilient local food economies that minimize negative externalities to the environment and human health.

Root Capital has helped grow prosperous rural economies in Latin America and Africa since 1999 by “lending capital, delivering financial training, and strengthening market connections for small and growing agricultural businesses.” Thus far, Root Capital has distributed over US$740 million to over 530 businesses working towards building sustainable livelihoods. And Grameen Bank has developed a new type of banking. Instead of traditional monetary deposits and other forms of collateral, the bank relies on accountability, mutual trust, creativity, and participation to provide credit to the poorest Bangladeshis. Grameen Bank uses a small-scale microcredit lending program (usually providing a few hundred U.S. dollars) to small enterprises in a variety of industries, including agriculture. Loans are only available to the poor, with a focus on women.

Investors—whether looking to lend large or small, domestically or internationally—should look for viable opportunities to support farmers and food entrepreneurs that will take responsibility for their full costs of production and grow their businesses to be strongly rooted in community food systems. Microcredit and microfinance models that reach women farmers, young entrepreneurs and beginning farmers, and ecological approaches to farming should be prioritized.

**Governments and Policy Makers**

Governments can challenge conventional thinking about sustainable agriculture with the power of the purse. Governments are already using their purchasing power in many ways, including through school feeding programs and procurement of foods for militaries, both of which exist in high-, middle-, and low-income countries. Government procurement of food for schools can encourage “the relocalization of diets, and they may also provide an opportunity to provide nutrition education to children, and thereby to reach families, for instance in order to encourage populations to shift to traditional, locally-grown foods; they allow to reconnect children to the sources of their foods, for instance where school meal programs are integrated with vegetable gardens maintained on the school premises; and they may create or re-establish community links through the school’s projects.” The benefits can go beyond the purchasing of fresh, local foods.

According to the U.N., school feeding when linked to agricultural production, local food procurement and processing, has significant economic development and spin-offs. It can serve as a platform for Essential Package interventions—water, sanitation, nutrition, health and hygiene education, school gardens, improved environmental technologies and practices.

Many of the above mentioned externalities of food production are visible to governments—such as school gardens, nutrition, etc; however, there “many of the significant impacts of the agricultural sector on ecosystems, soil, water resources, biodiversity, and human health are economically invisible. Therefore they do not get the attention they deserve from governments or businesses who often make decisions based on traditional economic rationale. This information gap must be addressed if we are to ensure our goal of providing sufficient nutrition and good health for all, and generations to come.”

TCA can informs policymakers of the visible and invisible costs of food production, helping to design and implement more appropriate policies that address environmental, labor, and public health issues. Governments and policy makers can challenge the conventional thinking of our political system.

**Researchers and Scientists**

More research is needed to identify and populate a scientific map of the impact on farming system, followed by an economic assessment to monetize the damage. Also needed is more research on TCA, modeling, and how to apply it throughout the food supply chain. This type of research is also key to informing – and changing – our current food policies. Research also allows civil society to advocate for practices that are more healthy as well economically and environmentally sustainable for society.
TCA will force us to have real conversations about our food. To date, the discourse on sustainable food practices have largely been around one-off practices that have been discarded as unscalable. We must look at and quantify the macro effects, in addition to the small steps that make a food system truly sustainable.

The success or failure of us having a sustainable food system and achieving food security for all, “will be determined by our stewardship of ecosystems, agricultural lands, pastures, fisheries, and our management of labor, technology, policies, markets, and food distribution systems.”¹⁰⁹

We have the insights and experiences from across sectors that can transform the food system. We have momentum and traction that demonstrates that a wide range of leaders and consumer groups want to be part of the sustainable food systems solution. We must now build an unequivocal case that investing in and supporting food production and consumption practices that yield better outcomes for our planet and its people, is not only good for the soul but also for business.

As stated by HRH Prince Charles, The Prince of Wales, “[c]hiefly, how can we create a more sustainable approach to agriculture while recognizing those wider and important social and economic parameters—an approach that is capable of feeding the world with a global population rapidly heading for 9 billion? And can we do so amid so many competing demands on land, in an increasingly volatile climate and when levels of the planet’s biodiversity are under such threat or in serious decline? As I see it, these pressures mean we haven’t much choice in the matter. We are going to have to take some very brave steps. We will have to develop much more sustainable, or durable forms of food production because the way we have done things up to now are no longer as viable as they once appeared to be.”¹¹⁰

The opportunity to get it right will catapult an entirely new culture around our food system for the long-term. TCA can demonstrate that meeting global demands for food, making a profit and doing so sustainably are not mutually exclusive propositions. Our collective path forward is scaling up comprehensive approaches for sustainable food and agricultural practices. TCA is central to that mission.
organizations working on TRUE COST ACCOUNTING

Through the work of many organizations, farmers, eaters, businesses, policymakers, and the funding and donor communities are beginning to recognize the real cost of cheap food. True Cost Accounting has the potential to change the food system for the better.

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<th>CIVIL SOCIETY GROUPS</th>
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<tr>
<td>Earth Economics</td>
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<td>The Economics of Ecosystems and Biodiversity (TEEB) Agriculture and Food Project (TEEBAF)</td>
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<td>U.N. Food and Agriculture Organization (FAO)</td>
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<td>Natural Capital Coalition (NCC)</td>
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<td>New Economics Foundation (NEF)</td>
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<td>Sustainable Food Trust</td>
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<td>True Price</td>
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<td>Union of Concerned Scientists (UCS)</td>
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<td>Wealth Accounting and the Valuation of Ecosystem Services (WAVES)</td>
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### BUSINESS GROUPS

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<th>Group</th>
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<tr>
<td>The B Team</td>
<td>The B Team works with business leaders to scale TCA and enable businesses to make decisions that will benefit people and the planet. The organization is partnered with Natural Capital Coalition and the World Business Council for Sustainable Development, and is working to develop a Social Capital Protocol to quantify the impact of business on people.</td>
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<tr>
<td>Natural Value Initiative</td>
<td>The Natural Value Initiative aims to build awareness of corporate dependence on ecosystem services and to help corporations and investors take ecosystem services and biodiversity into account. The organization has developed a toolkit to help the food industry interact responsibly with ecosystem services.</td>
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### ACADEMIC CENTERS

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<tr>
<td>The Center for a Livable Future at the Johns Hopkins University Bloomberg School of Public Health (CLF)</td>
<td>The CLF focuses on research, policy, and communication to support TCA in the food system. CLF research has focused on the relationship between food production, the environment, and public health, probing topics such as the public health costs of sub-therapeutic antibiotic use in animal agriculture.</td>
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<td>The Center for Resilience at Ohio State University</td>
<td>Ohio State University’s Center for Resilience is creating tools to analyze how industrial products impact the environment.</td>
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<tr>
<td>The Agribusiness and Economics Research Unit (AERU) at Lincoln University in New Zealand</td>
<td>AERU uses research and applied economics to promote sustainable wellbeing. The group is assigning economic value to New Zealand’s rich biodiversity in addition to exploring other TCA issues.</td>
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<tr>
<td>Natural Capital Project (NatCap)</td>
<td>A collaboration of two major universities and multinational organizations, NatCap aims to improve biodiversity and human well-being through TCA. The organization has created a set of tools to simplify TCA, and NatCap works in countries around the world to scientifically test its approach.</td>
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4 http://www.mckinsey.com/Insights/Economic_Studies/How_the_world_could_better_fight_obesity
8 The United Nations Global Compact report, “Scaling Up Global Food Security and Sustainable Agriculture,” says a sustainable food system emerges when “land tenure is established; soil fertility is maintained and improved; water quality is enhanced; biodiversity is protected; farmers, farm workers, and all other actors in the agriculture supply chains earn livable incomes; food is affordable and nutritious; businesses can be competitive and efficient; and the use of energy and the discharge of waste are within the capacity of the earth to absorb forever.” United Nations Global Compact, Scaling Up Global Food Security and Sustainable Agriculture (New York: UN Global Compact Office Publishing, June 2012) p.6.
9 Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture; and Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
10 True cost accounting (TCA) is not the only terminology used to describe the practice of accounting for all costs associated with production of a product – including environmental, social, and economic costs. Similar terminologies include Triple Bottom Line (TBL), Full Cost Accounting (FCA), Life Cycle Analysis (LCA), Natural Capital Accounting (NCA), and Cradle to Cradle (C2C).
12 The Lexicon of Sustainability is a web platform that defines terms and principles around sustainability.
13 Lexicon of Sustainability, “True Cost Accounting,” at kixincononustainability.com/true-cost-accounting/
20 FAA, op. cit. note 19.
29 FAO, op. cit. note 28.
32 European Commission (EU), “The common agricultural policy (CAP) and agriculture in Europe – Frequently asked questions,” press release (Brussels, Belgium: 26 June 2013.)
37 Elinder, op. cit. note 35.
38 Elinder, op. cit. note 35.


96 Salman Hussain and Dustin Miller, The Economics of Ecosystems and Biodiversity (TEEB) for Agriculture & Food – Concept Note (Geneva, Switzerland: TEEB, 27 February 2014), p. 10.

97 The B Team, “About: The B Team,” available at bteam.org/about/, viewed 17 August 2015.


101 Stephen Reily, Founder, Seed Capital KY, discussion with author, 15 April 2015.


106 WFP, op. cit. note 89, p. 7.

107 Holden, op. cit. note 71.

108 Martin, op. cit. note 58.


114 Stephen Reily, Founder, Seed Capital KY, discussion with author, 15 April 2015.


118 USDA NRCS, op. cit. note 2, p. 5.


120 Duffy, op. cit. note 4, p. 1.

121 Duffy, op. cit. note 4, pp. 1-2.


124 Pimentel, op. cit. note 8.


