

Food audit

Counting the hidden US\$12-trillion cost of our dismal handling of global food resources.

There's an unfolding tragedy at the heart of the world's food system and its cause lies mainly at the door of governments, food manufacturers and agribusinesses.

The situation is urgent. One-third of all food goes to waste, and yet governments and other players in the food system are unable to prevent 820 million people from regularly going hungry. The food industry, especially, bears responsibility for the fact that 680 million people are obese, but it is largely governments and their citizens who have to pick up the costs of treatment.

When industrial-scale farms draw copious quantities of water to irrigate crops, again it is taxpayers who foot the bill for the water scarcity that can follow. It's the same for agrochemicals and their effects on the health of people and ecosystems. Governments find themselves shouldering the costs of biodiversity loss, and mopping up agriculture's contribution to greenhouse-gas emissions.

These hidden costs — or externalities — must be met, and last month a landmark report estimated them to be somewhere in the region of US\$12 trillion a year, rising to \$16 trillion by 2050. That is a staggering figure — equivalent to the gross domestic product of China.

What is equally alarming is that these costs are not being regularly counted, and the food and agriculture industries seem to assume that the bill will be paid. That isn't right and has to change.

The report, which is the work of an organization called the Food and Land Use Coalition — which includes business groups and research institutions as well as the United Nations — also calculated the costs that governments and businesses would need to pay to transition to a more sustainable food system. That estimate comes to somewhere between \$300 billion and \$350 billion annually. In addition — and after taking account of hidden costs — a more sustainable food system

could yield a further \$5.7 trillion a year by 2030 in new economic opportunities, offsetting the \$350-billion price tag by many multiples.

For example, a transition to plant-based diets containing less salt, sugar and processed foods is estimated to cost \$30 billion. But the resulting economic benefits are predicted to be around \$1.28 trillion. Cutting food waste is similarly estimated to cost \$30 billion, with an estimated \$455 billion expected to flow in commercial opportunities from waste reduction.

“There must be more-regular accounting of these hidden costs.”

So if there's money to be made, it is reasonable to ask what is holding companies back. Why aren't they queuing up for a slice of the pie? Some undoubtedly are, but more could be persuaded, or compelled, to act.

Governments have several levers when it comes to getting companies to change behaviour. One is taxation, a function of which is to fund public services, including clean-up efforts. Another lever is regulation — although in recent years, the fashion among some governments, in developed countries at least, has been to avoid imposing strong regulations. Instead, there is a move towards using softer methods to change practices in industry, drawing on the work of researchers in the behavioural sciences, for example.

A third lever is financial incentives — such as promoting the idea that companies can make profits from sustainability. Such an approach has had a measure of success following the influential 2006 publication of *The Economics of Climate Change: The Stern Review*, from development economist Nicholas Stern of the London School of Economics and Political Science. Among other things, this report and others that followed paved the way for several climate-change funding initiatives.

Whichever lever is used — and the most effective route is likely to involve a combination of all three, and more — there must be more-regular accounting and publishing of these hidden costs. That could be a task for national ministries of finance, or national statistics offices, working closely with researchers.

The Food and Land Use Coalition has performed an important service, but its calculations cannot be a one-off exercise, and governments, in turn, need to use these data to compel industry to act. ■

Protect the census

The census risks becoming a casualty of the rush to embrace big data. But it could save lives.

Every child death is a tragedy. That's why a huge survey published this week on global child mortality is both striking and important. The work, by a collaborative team of some 4,000 people, is a detailed study of the variation in mortality rates among under-fives across 99 low- and middle-income countries between 2000 and 2017 (R. Burstein *et al. Nature* 574, 353–358; 2019). It is one of the largest studies of its kind.

The work, led by Simon Hay at the University of Washington in Seattle and funded by the Bill & Melinda Gates Foundation, was carried out to help countries identify districts where under-fives are at greater risk of premature death.

Overall, deaths among under-fives have fallen from 19.6 million in 1950 to 5.4 million in 2017, thanks to steady gains in socio-economic development and public health. Today, the overwhelming majority of under-fives mortality is in low- and middle-income countries, which is why the researchers chose these countries to dig deeper.

The study is particularly valuable for its detail: it allows health-policy officials, researchers and non-governmental organizations to see district-level data. So although, at a national level, some countries — such as Colombia and Panama — have achieved the United

Nations target of reducing infant mortality to fewer than 25 deaths per 1,000 live births by 2030, there are individual regions that are yet to reach the goal. Hay and his colleagues' work will help to identify these left-behind populations that, he says, “we need to pay more attention to” — with extra efforts to tackle poverty, inequality and poor health.

What is also remarkable about this piece of work is that it relied on a research method that risks going out of fashion. The team collected their information by poring over records of household surveys, including information on individual families that many countries record in a conventional census. More than 450 separate surveys provided the basis for the data, often asking the difficult questions of how many children a person has had — and how many have survived.

“We need more surveys,” Hay told *Nature*. Unfortunately, in many countries, censuses are being scaled back. The conventional technique of processing paper-based forms, or sending interviewers to households, has always been expensive. That is one reason why, increasingly, households are being asked to fill out census data online — and it is possible that, at some point, this, too, will end.

After all, in many countries, swathes of digital data on citizens are already being collected online — from health and education records to election registration, tax returns and more. But these data may not be as comprehensive as a full-blown census, and in less-wealthy countries the data may not be collected at all, which is why censuses are still invaluable.

Hay and colleagues' work is a reminder that the conventional census has powerful uses. It is costly and time-consuming, but in this case it could demonstrably save lives. Governments should think harder before scaling back or abandoning censuses — and if they do, it's vital that other funders step in. ■