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The Economics of Sustainable Food

Smart Policies for Health and the Planet

Nicoletta Batini • Island Press © 2021 • 320 pages

Economics / Economic Policy
Industries / Agriculture

Take-Aways

- The world's food systems are contributing significantly to global environmental challenges.
- Greening agri-food systems – especially in advanced economies – will make them healthier for the planet and its people.
- Dietary changes, if widely adopted, could eliminate one-quarter of global emissions.
- In less advanced economies, policy makers will have to strike a balance among nutrition, affordability and sustainability.
- The world needs to shift to sustainable approaches to farming, both terrestrial and aquatic.
- Policy should support the conservation of forests and soils, oceans, mammals, and insects.
- Reducing food waste could make a significant impact on sustainability and global food security.
- To meet global warming targets, the world will have to change its food production methods, dietary habits and land use.
- Sustainable food policies also offer significant economic benefits.

Recommendation

The world can't win the fight against climate change without changing the way it produces and consumes food. This authoritative volume, edited by economist Nicoletta Batini, offers a comprehensive survey of the challenges facing policy makers and scientists as they seek reforms to the agri-food sector. Although written for experts, the essays are clear and accessible enough to interest any reader seeking to understand the nexus of sustainability and food.

Summary

The world's food systems are contributing significantly to global environmental challenges.

Agri-food – the world's systems for producing and transporting food, as well as people's dietary choices – play a bigger part in climate change than even fossil-fuel burning does. To meet the UN 2030 Agenda for Sustainable Development and the goals of the Paris Agreement, the world will have to green its food systems, and people will have to change the way they eat. Agriculture accounts for at least one-fifth and possibly more than two-thirds of the world's greenhouse gas (GHG) emissions, which, within food systems, primarily result from deforestation, the burning of fossil fuels, livestock methane releases and nitrous oxide discharged from soils and livestock operations. Livestock alone produce about 15% of all global GHG emissions.

“The ecological footprint from current agricultural methods demonstrably exceeds the carrying capacity of the planet.”

Agricultural and fishing practices are harming the planet in other ways, too, such as by water use and pollution, fish stock depletion, the destruction of aquatic habitats and ongoing mass extinctions. Beyond their environmental impacts, the world's food systems also contribute to economic inequality around the world, food insecurity and malnutrition, urbanization, and public health risks. In coming years, the agri-food system's sustainability, along with global food security, will likely degrade further due to population rises, income growth, biodiversity losses and the effects of climate change. Attempts to keep pace with increasing food demand will result in rising emissions, resource competition, deforestation, land degradation – and further climate change.

Greening agri-food systems – especially in advanced economies – will make them healthier for the planet and its people.

The world urgently needs a Great Food Transformation, analogous to the Great Energy Transformation described at the World Economic Forum meeting in 2019. A combination of agricultural reforms, dietary changes and reductions in food waste could potentially slash the world's GHG emissions by more than 40%, while aiding conservation, making people healthier, raising labor productivity, fighting inequality and mitigating mass migration. Central areas for policy include supporting dietary changes, regenerative farming and conservation.

“The agri-food industry is...the number one enemy in the fight against climate change.” (IPCC, 2019)

The heavily industrialized food production sectors of the advanced and the large emerging-market economies represent the single biggest culprit in climate change, environmental degradation and biodiversity losses. To green food production in these economies, authorities should aim for three objectives: First, reduce animal-based food production and shift to plant-based production; second, move toward regenerative farming; and third, support the rewilding, reforestation and afforestation of lands that these sustainable practices will free up.

Dietary changes, if widely adopted, could eliminate one-quarter of global emissions.

The high-calorie and heavily animal-based diet of the advanced countries has a severe impact on GHG emissions, land use and pollution. The most significant factor: meat and dairy products from ruminants. If people around the world completely eliminated animal-based food from their diets, that change alone would cut 25% of global emissions.

“One kilo of beef protein [is] roughly equal to driving a new car for a year or to one passenger flying from London to New York and back.”

In the advanced economies, policy to support sustainable food demand could include fiscal tools to influence eating habits. Hungary and Mexico offer examples of the taxation of unhealthy foods to discourage their consumption. The United States and United Kingdom have long employed subsidies to support healthy choices as well as health bonuses – similar to eco-bonuses for the purchase of environmentally friendly vehicles. Reforms in the health care system could also support dietary shifts.

In less advanced economies, policy makers will have to strike a balance among nutrition, affordability and sustainability.

People in many low- and middle-income countries (LMICs) suffer from malnutrition – both overnutrition and undernutrition – in part due to a lack of access to healthy alternatives. To encourage interest in good diets, leaders will need to tailor strategies for different population groups and take action at the community level, as well as through the public and private sectors. And to make it possible for people in developing countries to shift to a more nutritious diet – while maintaining global progress on sustainability goals – citizens of developed countries will need to accelerate their shift to plant-heavy diets.

“Alongside efficient use of all food and demand for sustainable food, small-scale regenerative agriculture is the backbone of global food security.”

An emphasis on calorie production since the Green Revolution has resulted in deleterious impacts on human health and the environment: high GHG emissions, intense demands on water resources and the shrinking of agrobiodiversity. Policy makers working in the less advanced economies should think in terms of three pillars: providing nutrition security, keeping environmental impacts to a minimum and encouraging climate resiliency. Trade-offs will be necessary in regard to GHG emissions, as all the dietary models that would provide adequate nutrition also result in increased emissions. Although decision makers in

agriculture and in public health don't typically work together, cross-silo decision making could facilitate policies that promote priorities in multiple areas.

The world needs to shift to sustainable approaches to farming, both terrestrial and aquatic.

The use of sustainable farming methods could aid reforestation, reduce reliance on chemical pesticides and synthetic fertilizers, and help preserve soils, water, and other natural resources. Policy should encourage farmers to adopt innovative approaches to sustainable food production. In polycultural farming, operators manage farms to generate multiple benefits simultaneously, beyond economic gains – including ecological and social benefits. Polyfunctional farms tend to embrace diversity in crops, livestock and production phases, and this diversity in turn supports resilience to climate change. Controlled-environment agriculture (CEA) refers to indoor farming, including vertical farming (VF) – growing in multistory structures, often with hydroponics or aeroponics, and under LED lighting. CEA and VF offer the advantages of high production rates, optimal land use, minimized transportation, crop protection from weather disruptions and pests, and the elimination of pesticides and herbicides.

“Rooting carbon back into the ground through regenerative agriculture is one of the greatest opportunities to address human and climate health.”

In regenerative ocean farming (ROF), small, low-cost gardens produce seaweed and shellfish. This farming approach offers advantages similar to VF, with the additional benefits of absorbing carbon and nitrogen from ocean water and offering habitats for a multitude of sea creatures. Alternative protein farming (APF) refers to the production of two distinct types of “meat”: plant-based products designed to imitate meat, and cultivated meat grown from animal cells in tanks. Both offer substantial environmental advantages, thanks to their reduced carbon footprints, compared to those of conventional meat.

To address climate change, policy should aim at ending subsidies for monocultural farming and shifting support to polyfunctional operations and other forms of sustainable farming. To support ROF, leaders should prioritize blue carbon funds – paying farmers for sequestering carbon and nitrogen – and simplifying the process for obtaining permits. Policy makers could play a role in the development of APF by supporting research and endorsing labeling that encourages the consumption of alternative meats.

Policy should support the conservation of forests and soils, oceans, mammals, and insects.

Agriculture has claimed nearly half of all the land on Earth capable of supporting plant life. Conventional agriculture drives deforestation, while fishing causes the destruction of marine habitats and declines in ocean wildlife populations. Deforestation and hunting are driving decreases in wildlife numbers and are threatening many mammal species with extinction. Insects, too, are experiencing habitat losses and threats resulting in large part from food production.

“In pushing other species to extinction, humanity is busy sawing the limb on which it perches.” (Biologist Paul Ehrlich)

Meeting climate goals such as those of the Paris Agreement depends on maintaining healthy soils and intact forests. To help conserve them, policy should encourage regenerative agriculture. Promoting the health of the oceans goes hand in hand with curbing climate change, and policy makers should encourage conservation and sustainable seafood farming through tools such as blue carbon funds and fiscal incentives for sustainable fishing practices. Rules to support mammal conservation should focus on protecting important habitats for biodiversity, encouraging sustainable farming practices, and collaborating with public and private partners at every level. Policy for insect conservation should promote ecological principles in farming, particularly organic farming.

Reducing food waste could make a significant impact on sustainability and global food security.

Nearly one-third of the food that the world produces goes to waste. “Food loss” denotes food discarded in the supply chain, while “food waste” refers to food that retailers and consumers throw away. Food loss and waste (FLW) has an enormous impact on sustainability: It accounts for nearly 10% of GHG emissions and about one-quarter of fertilizer and freshwater use. FLW also affects food security, as it represents the loss of about one-quarter of all food calories produced. In economic terms, FLW costs the world nearly \$1 trillion worth of food annually, based on 2011 figures.

“We are trashing our land to grow food that no one eats.” (Food activist Tristram Stuart)

Reducing food waste represents a readily attainable policy goal, and the need to reduce FLW has gained wide recognition. Indeed, the UN Sustainable Development Goals call for cutting FLW in half by 2050. High-income countries have taken action, but low- and middle-income nations have lagged behind. A lack of sufficient information appears to be a constraint in LMICs. The drivers of FLW vary considerably across regions and commodities; reducing it will require a diversity of policy interventions.

To meet the global warming target, the world will have to change its food production methods, dietary habits and land use.

The transformation necessary to limit global warming to 1.5°C [2.7°F] will require supply-side and demand-side changes: First, plant-based production will have to grow to replace much animal-based production. The 1.5°C goal will necessitate a 50% cut in red meat and dairy production. This reduction would improve the efficiency of food production while reducing deforestation and freeing up land for more sustainable uses. It would also reduce GHG emissions attributed to ruminants. Second, the world will need to shift from monoculture agriculture to regenerative forms of farming, such as organic farming, which offer resilience and support for biodiversity.

“Without action, by 2030 the livestock sector alone could account for 37% of the emissions allowable to keep warming under the 2° target and 49% if the temperature goal is 1.5°C.”

On the demand side, the world’s citizens will need to adopt healthier and more sustainable eating habits. A flexitarian diet – primarily based on plants but also including some meat, fish and dairy products, and limiting refined grains and highly processed foods – would promote both optimal human health and ecological sustainability. And the world must protect its forests and plant more of them. The proposed

Global Deal for Nature would shield 30% of the planet's land to help limit global warming. Reaching the larger goal of restoring 50% of the world's land to natural ecosystems would stabilize the Earth's climate.

Sustainable food policies also offer significant economic benefits.

A shift to sustainability in food production would boost outcomes and generate more jobs. The benefits would vary from country to country, but a simulation in France indicated that a shift to organic growing, changes in livestock herds, a switch to renewable energy sources in the sector and a greater emphasis on agroforestry would boost the food sector's value by 10% and increase the number of jobs in the industry by about the same amount. Emerging and developing economies would likely see greater benefits due to the size of the agriculture sector in those countries and the advantages to be gained from localizing their food supplies.

"If we can muster the will before it is too late, we can have our nutritious food, thriving economies and a habitable planet, too."

Greening food demand would bring immense economic benefits, including reduced health care costs, as well as increased productivity, household incomes, savings rates and potential growth – and a decreased risk of global pandemics. Cutting food waste has the potential to boost annual business profits by nearly \$2 billion and positively affect global GDP. The benefits of conservation include protecting important sources of economic goods and employment – the world's forests, fisheries, wetlands and agricultural lands – as well as the ecosystem services that soils, forests, oceans, mammals and insects perform.

About the Author

Nicoletta Batini is an economist and a leading expert in the design of macroeconomic strategies dealing with climate change and public health. She is the lead evaluator at the International Monetary Fund's Independent Evaluation Office.

