



## FOOD: PERSPECTIVES ON SUSTAINABILITY

### Abstract

With the ever-increasing demand for food to cater to the global population, the food industry has quite a task on its hand. The natural resources required such as land, water and biodiversity are already under stress. The food sector itself, however, plays a significant role, albeit in a negative manner, in the long-term sustainability of the industry and the planet. For the food industry, it is no longer a question of remaining profitable but of long-term viability – it must balance environmental, economic, and social considerations and actively embark on sustainability initiatives for building a better future.





## Food: A critical cog in the planet's sustainability

The most visible aspect connecting food with sustainability comes in the form of the second Sustainable Development Goal (SDG): Zero Hunger<sup>1</sup>. The unfortunate reality is that ~700 million, or around 9% of the global population, is hungry. Today, one in ten

people are exposed to severe levels of food insecurity. Beyond the direct human aspect related to hunger, food and the food industry have significant impact on the planet.

Issues such as impact on the environment due to food production and food wastage in more developed countries have become areas of immense concern. Consider this:

The UN Food and Agriculture Organization (FAO) estimates one third of all food produced for human consumption is wasted, and the environmental implications of this are devastating. FAO estimates the carbon footprint from food produced and not eaten is ~3.3 gigatons of CO<sub>2</sub>, making it the third highest emitter in countries like China and the US.

### Impact of the food industry:

20%+ of world's greenhouse-gas (GHG) emissions stem from agriculture and food systems, and over half of that from animal farming alone

Food production using synthetic chemicals, fertilizers and pesticides leads to degradation of the soil, reduced biodiversity, lower water retention and impact on human health

14% to 20% of the food produced is wasted at wholesale and downstream distribution and processing stages

66% of global crop production is concentrated across just 9 plant species, leaving the world population vulnerable to climatic events and pestilence

---

<sup>1</sup> <https://sdgs.un.org/goals>



## Integrating ESG into every bite

The industrialization of agriculture and food processing has resulted in increased food production and availability; it has also led to the reduction in the number of individuals that are directly involved. This has enabled the society to focus on increasing the quality of life, but there are large swathes of areas across the world where availability of food is still an issue. The problem with food availability, however, is one of equitable and humane distribution. The other key aspect that is equally important, especially in places where there is a problem of plenty, is the cost of food security and surplus. Both these aspects – food inequity and continued availability of food –

surprisingly, are intertwined. The question that begs an answer is: How sustainable is it in the long term? From a societal point of view as well as the business of feeding billions, sustainable actions that consider a larger, long-term perspective are required.

The sustainability goal for the food industry goes beyond food production, and welfare of food producers and should encompass environmental, social, and governance (ESG) aspects. It needs to capture food production, welfare of food producers, habitat preservation, conservation, maximizing the utilization of non-renewable resources, and social responsibilities of promoting healthy living.

ESG integration as a consideration is gaining prominence because many in the food

sector are realizing that having to choose between “profit” and “ethics” doesn’t need to be an impossible trade-off. If done right, sustainable food practices can increase profit, improve soil health leading to better crop yields long-term, improve yields, reduce waste, and more. For example, by deploying a series of Best Management Practices and using online mapping application to identify minimal environmental (biodiversity) impact areas, Malaysian palm planters were able to increase Fresh Fruit Bunch yields. Similarly, adoption of alternative pasteurization methods like PEF in milk product processing can increase shelf life by up to 240%, as well as deliver greater yields, energy savings and lower operational costs without affecting sensorial and functional value.





## Drivers of change

**Bottom-up pressure:** Sustainability in food is a global trend with customers increasingly conscious about not just what is on their plate but also how that has been sourced and the environmental impact of their consumption. Individuals, today, are equally concerned about mileage of the food i.e. the distance that food travels to reach the dinner table; the social aspects of food – is the local community benefitting, has it been exploitatively produced, transition from “doing no harm” to “doing good”; twin goals of “healthy me and healthy

planet”. Consumers place a high value on sustainability and are willing to pay more for sustainably sourced, produced food. These are clearly visible in the trend towards opting for organic food (environment and health-friendly), inclusion of plant-based food in the diet (lesser carbon footprint), dietary variety (promote biodiversity), fresh produce and sustainably packaged (promote local economy and reduce waste) and fair-trade foods (ethically sourced and giving to society).

**Top-down pressure:** Government actions and mandates are also spurring companies to making efforts to promote sustainability

in the food industry, for example, reforming elements of agricultural policies through new regulations, incentives and/ or environmental taxes, and administrative mechanisms. Governments in response to citizens’ interest and backed by scientific studies are enacting environment-friendly rules and policies in food processing and distribution. For example, governments world over are contemplating removing best before dates in favour of perishables packaging with built-in electronic chips that turn from green to red as they sense the food spoiling.

Sustainability initiatives in the food industry need to be present in all stages of the farm-to-fork value chain: growing and production of foods, sourcing of foods, food processing and distribution.

There are various initiatives that organizations can undertake across the food industry value chain to drive sustainability:

1. **Agricultural practices:** Implement efficient farming practices such as building on-farm biomass and restoring soil health, incentivizing cropping systems that factor topography, water availability and soil conditions.
2. **Building resilient farming communities:** Hire from local communities, provide safe and fair working conditions, and invest in infrastructure development to increase market access and promote the development of circular agri-economy.
3. **Wastage reduction at every stage:** Post-harvest food loss reduction through thermo-moisture-controlled storage, usage of plant-based insecticides; bulk packaging for better transportability; measurement of food losses during manufacturing; oxygen-barrier packaging to reduce spoilage at retail level; instituting measures to curb individual food wastage (eg. portion sizes).
4. **Food processing: Use sustainable ingredients;** reduce energy and water consumption in processing and manufacturing; ozone processing, hydrodynamic cavitation, and alternative methods of increasing shelf-life.
5. **Environment-conscious packaging:** With packaging constituting ~60% of global solid waste, consider using bio-degradable/ edible/ compostable/ plant-based materials to reduce plastic-dependency, or a circular value chain model with recollect, reuse and recycle initiatives.



## Tech powering innovation

Technology has a vital role in helping the industry itself be viable while meeting the sustainability goals and consumer expectations, such as:

- AI-powered decision support systems for farm management integrated with Smart Farming, enabling precision agriculture
- Implementing a digital food value chain backbone connecting primary producers, processors, distributors, and consumers
- Intelligent real-time monitoring for environmental conditions during production and storage to ensure food quality (contamination, spoilage)
- Development of functional foods and targeted nutrition for individuals
- Blockchain based systems to solve issues such as food fraud, safety recalls and food traceability

Sustainability in the food industry is a focus area for global technology product and system integrators. Technology leaders, such as Microsoft, are rolling out off-the-shelf consumable applications and services that can be used to build solutions that deliver sustainable outcomes. For example, water management solutions built with Azure IoT Central services and Microsoft D365 Connected Field Service in conjunction with smart water devices such as flow meters, water quality monitors, valves and leak detectors can greatly reduce water consumption as well as energy usage in intensive crops such as rice.

At Infosys, our Agriculture practice helps food producers, processors, distributors, and warehouses prevent contamination and wastage of fresh and processed products. We implement a sensor network to monitor the condition and quality of food on retail shelves, during processing and in transit. It automates

reporting of parameters such as location, temperature and shipping time. Moreover, it triggers an alert mechanism when the environmental condition of a unit / batch of perishable products deviates from the norm.

Our farm-to-fork traceability solutions minimize delay in food shipments and isolate the source in the event of a safety issue. We implement compliance and governance frameworks to address operational requirements for Good Manufacturing Practices (GMP). This prevents physical, chemical and biological contamination, enhances the reliability of cold chains, and facilitates statutory audits. Digital systems ensure data integrity and validate compliance with food safety standards in real time.

Find out more about our Infosys Agriculture offerings



## Choosing a sustainable future for your organization and the world

Sustainability is a natural goal for the food industry, as connected it is with the survival of humankind. Beyond the obvious need to produce food with the least burden on the planet, food processors and manufacturers have woken up to the fact that environmental and social responsibilities go hand-in-hand with their core business objectives.

Consumers and government initiatives are demanding responsible behavior from organizations—and the sustainability initiatives undertaken by companies are becoming as much a part of their brand identity as the products themselves.

By adopting an ESG-focused approach, the food industry can ensure their investments pay off in the long-run and meet consumer expectations to make the world a better place to live, for themselves and for future generations.



## Discover more

We've developed a series of opinion pieces on sustainability based on the pillars of ESG across some of the different industries our clients operate in.

Take a look at the papers below to discover the main sustainability challenges and trends in your industry today and how Infosys can help you get the best of both worlds, profits and ethics, with an ESG approach.

**ESG approach »**

**Fashion »**

**Finance »**



## About the author



**Sreeram Lekshminarayanan**, *Principal Consultant*

Sreeram Lekshminarayanan, a Principal Consultant with Infosys, has over 22 years of strategy, consulting and information technology experience. He has been involved in architecting, program management and delivery of large Enterprise Business Applications-based business transformation programs at clients in the US, Europe, Australia and Middle East. He currently focusses on research and concept-to-development of innovative digital solutions that address business problems across industries utilizing emerging technologies such as AI, Analytics, Blockchain and IOT around core organizational IT systems.

For more information, contact [askus@infosys.com](mailto:askus@infosys.com)



© 2022 Infosys Limited, Bengaluru, India. All Rights Reserved. Infosys believes the information in this document is accurate as of its publication date; such information is subject to change without notice. Infosys acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. Except as expressly permitted, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior permission of Infosys Limited and/ or any named intellectual property rights holders under this document.