Chapter 3
Food Sustainability Index Report on the United States: The Good, the Bad, and the Ugly

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Abstract Global concern for land use revolves around human activity, such as agriculture for food, employment, recreation, and daily sustenance (e.g., air, water, shelter). While the introduction of policy helps to abate the impact of detrimental land use practices in the United States, other national food sustainability indicators created by The Economist Intelligence Unit and the Barilla Center for Food & Nutrition (BCFN) introduce new performance metrics that inform policy. These indicators, such as the environmental impact of agriculture on natural land and water resources, provide a method to determine if key factors are being addressed or have yet to progress towards desired targets and then compare results to other nations. The Food Sustainability Index report, based on the United Nations Sustainable Development Goals and other international input such as the Milan Protocol, demonstrates the US status in the global race for improvements in diet, agricultural practices, and food waste. This brief reflects positive, marginal and poor indicators of US headway on overarching problems relating to climate change, such as food loss and waste, sustainable agriculture, and nutritional challenges impacting the ecosystem and population health. These indicators provide a baseline and progression to pinpoint areas that remain unresolved to educate, spur on innovators to pioneer solutions, and guide policymakers.

3.1 Introduction

All national contributions towards food sustainability help to advance several common targets from the United Nations Sustainable Development Goals (UN SDGs) to improve nutrition (SDG 2) and sustainable consumption and production (SDG 12) (2015). One method to achieve these and other international goals is to monitor progress on component objectives at the national level. This premise led the Barilla

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B. A. Fiedler (ed.), *Translating National Policy to Improve Environmental Conditions Impacting Public Health Through Community Planning*,
https://doi.org/10.1007/978-3-319-75361-4_3

Center for Food & Nutrition (BCFN) to create The Food Sustainability Index (FSI), "a tool designed to highlight international policies and best practices relating to global paradoxes and to the main SDGs for food, climate change, sustainable cities, responsible production and consumption, health, gender equality, education and infrastructure" (BCFN 2016a, *para* 1; United Nations 2015).

France achieved the highest overall FSI composite score (67.53) in 2016 on a scale of 100 while Japan was second overall at 66.66 followed by Canada at 64.86. France also topped two categories—(1) food loss and waste, and (2) nutritional challenges while Germany led in sustainable agriculture. The USA did not reach any top 10 categories. The highest US ranking was number 11 in food loss and waste (58.86) behind number 10 Columbia at 60.02 and narrowly edging out Ethiopia at 58.66 (BCFN 2016b).

Assessing the factors that are relevant to planetary ecosystem sustainability has continued to evolve into these new national performance measures. The Economist Intelligence Unit and the BCFN tested 25 countries in three categories—(1) food loss and waste, (2) sustainable agriculture, and (3) nutritional challenges to obtain an overall composite score in a food sustainability study. Food loss is generally defined as products that are discarded, left uneaten, or otherwise removed from the supply chain (World Resources Institute 2016), while sustainable agriculture occurs when farming methods embrace ecosystem friendly processes to avoid natural resource depletion. "The basic goals of sustainable agriculture are environmental health, economic profitability, and social and economic equity" (National Sustainable Agricultural Coalition n.d., *para* 2). Finally, the FSI incorporates the concept of nutritional challenges under the general categories of life quality (e.g., undernourishment, micronutrient deficiency), life expectancy (e.g., health impact due to nutritional deficiencies), dietary patterns such as the purchasing power for fresh food and diets high in sugar content, and policy (BCFN 2016b).

However, the grading scale reflects just how much more work is needed to reach acceptable levels of food sustainability across the globe. Scores 67+ that are approaching 100 reflect a positive direction for existing policy and practices. However even the best overall nations, such as France (67.53), barely squeaked into top category indicating that room for improvement is consistent across all nations undergoing the analysis. Marginal progress towards sustainable practice in individual and overall categories is indicated by scores ranging from 34 to 67 while scores ranging from 0 to 33 reflect little or no progress towards end goals.

"The Milan Protocol promotes healthy lifestyles to fight famine and obesity, sustainable agriculture and a 50% reduction in food waste by 2020" (BCFN 2016c, *para* 4). The FSI metrics were elicited from these three overarching global paradoxes defined in the 2015 updated Milan Protocol. Specifically, these paradoxes are (1) the amount of wasted food that could be used to feed the hungry, (2) unbalanced sustainable agriculture practices versus low nutritional value/high resource cost in raising cattle, and (3) the portion of the global population that suffer from hunger while two times that number overconsume (BCFN 2015). Thus, the index focuses on climate change resulting from the impact of global practices of agricultural

production, land use, and national dietary eating patterns that could be reversed through education.

While the FSI results highlight outstanding practices in the USA, such as air quality climate change mitigation, their sluggish status in the global race for improvements in some indicators of nutrition, agricultural practices, and food waste is an important pointer targeting specific areas for improvement. The index scores provide a broad sweep of the status of sustainable agriculture that demonstrates the need for a cultural shift away from poor dietary habits reflected in a disproportionate consumption of unhealthy food products (e.g., high sugar, fast food) and general overconsumption combined with low physical activity levels. This brief reflects positive, moderate and negative indicators of progression to help educate, and perhaps formulate, innovative solutions.

3.2 United States Food Sustainability

The USA remains dedicated to improving climate change in building design standards (GAO 2016a), providing tools to communicate the environmental impact of climate change on public health (CDC 2017), and addressing the agricultural conservation through various programs including revisiting the agricultural impact of renewable biofuels on the environment (GAO 2016b, 2017a; von Witzke and Noleppa 2014). A considerable number of resources across dozens of agencies contribute to climate change resolution from the ocean floor—National Oceanographic Atmospheric Administration (NOAA), to the sky—National Aeronautics and Space Administration (NASA), and everything in between (GAO n.d.).

> (GAO n.d., *para* 1):
>
> Federal funding for climate change research, technology, international assistance, and adaptation has increased from $2.4 billion in 1993 to $11.6 billion in 2014, with an additional $26.1 billion for climate change programs and activities provided by the American Recovery and Reinvestment Act in 2009.

The total amount of funds allocated to various agencies to address climate change should be considered in the wake of disapproval of President Trump's proposed budget reduction for the US Environmental Protection Agency (EPA) (GAO 2016c). Further, that the budget may not reflect assumed national disinterest in climate change but instead, the redistribution of funds to the many agencies engaged in climate change activities (GAO n.d.).

Table 3.1 demonstrates the positive results stemming from extensive agency investment and resource allocation towards policy development in the areas of food loss and general dietary patterns affecting public health. Food loss policy is one of two fully sustainable ratings for the USA based on the US Department of Agriculture ongoing recommendations (USDA n.d.). The other is air quality, measured in greenhouse gas (GHG) emissions, through a US EPA Agency policy platform that monitors emissions and targets specific areas to reduce emissions (EPA 2017). US plans

Table 3.1 The good: positive results of the United States Food Sustainability Index Report, 2016 (The Economist Intelligence Unit and the Barilla Center for Food & Nutrition 2016b)

Categories	United States	Food loss and waste	Sustainable agriculture	Nutritional challenges
Food Loss	Food Loss	93.58		
	Policy response to food loss	100		
	Causes of distribution-level loss	75		
	Solutions to distribution-level loss	74.93		
End-User Waste	Policy response to food waste	78.95		
Water Resources	Water Scarcity		83.33	
Land	Land ownership		71.04	
	Environmental biodiversity		94.22	
	Productivity		67.51	
Air	Climate change mitigation		100	
Life Quality	Prevalence of under-and malnourishment			98.77
	Micronutrient deficiency			88.31
Life Expectancy	Life expectancy			82.12
	Impact on health of nutritional deficiencies			99.34
Dietary Patterns	Purchasing power for fresh food			72.74
Policy response to dietary patterns	Policy			100

Note: Scale 67+ positive direction for existing policy and practices; 34–67 Marginal progress; 0–33 reflect little or no progress towards sustainable practices

to further reduce emissions by 2025 to levels 26–28% below 2005 levels were announced in the Intended Nationally Determined Contribution (INDC) following the United Nations Convention on Climate Change (UNFCCC 2015).

Environmental biodiversity—the variety of species and organisms in an ecosystem—is the strongest US indicator of positive land use (94.22) but how the nation uses land in terms of productivity barely moved beyond marginal measures (67.51). The USDA considers the protection of natural resources (e.g., farmlands, wetlands, forests, flood plains) important to the nation's water supply and an economic asset as raw material for production and agriculture (USDA 1983). Therefore, continuous attention is afforded to land policy use to secure these assets.

3.3 United States Environmental Land Use

The seven major land uses in conjunction with environmental protection are well-known having been reported in many USDA and EPA publications. They include physical resource management, waste disposition, transportation, urbanization, agriculture, wilderness, and recreation. However, the volume of US land dedicated

Table 3.2 The bad: marginal results of the United States Food Sustainability Index Report, 2016 (The Economist Intelligence Unit and the Barilla Center for Food & Nutrition 2016b)

Categories	United States	Sustainable Agriculture	Nutritional Challenges
Water Resources	Sustainability of water withdrawal	61.50	
	Waste management	50.00	
Land	Environmental impact of agriculture on land	36.99	
	Animal welfare policies	57.14	
	Diversification of agricultural system	58.92	
	Quality of R&D and innovation	55.48	
Air	Environmental impact of agriculture on the atmosphere	59.07	
Life Quality	Ecological efficiency of supporting people's well-being		37.30
	Healthcare expenditure and costs		39.61
	Ecological efficiency of supporting people's well-being		37.30

Note: Scale 67+ positive direction for existing policy and practices; 34–67 Marginal progress

to agricultural purposes makes the topic of sustainable agriculture important to the vitality of the nation.

The USDA compiles US Census of Agriculture reports reporting land use details in conjunction with information supplied by the Economic Research Services (ERS) since the mid-twentieth century. Alaska contains the principal portion of forest land while grassland pasture and range are prominent in the contiguous 48 states accounting for approximately 52% of the US land base in 2012 was "used for agricultural purposes, including cropping, grazing (on pasture, range, and in forests), and farmsteads/farm roads" (USDA 2017, *para* 1). The total US land area approximates 2.3 billion acres (USDA 2017).

Table 3.2 reflects marginal progress on several aspects of land use that continue to be problematic for the USA despite concerted efforts in agricultural conservation (GAO 2017a). Not surprisingly, these challenging activities are based on agricultural use causing environmental impact on the land (36.99) and the atmosphere (59.07).

While US food sustainability policy has positively addressed some aspects of food loss, dietary patterns, and climate change mitigation for air quality, the FSI indicates that the nation has not sufficiently advanced in the development of instruments, programs, or tools to address other specific elements related to land use. Weaknesses in policy and long-term implications for quality of life are inherent in several factors. For example, Native American tribal land use including road access,

transportation and consequent education benefits (GAO 2017b), protection of drinking water sources (GAO 2016d), and rural water infrastructure (GAO 2015) contaminated with farming pesticides are among some of the topical areas of concern. Further, they demonstrate the wide array of technical proficiencies and collaboration between and among multi-sectoral agencies to address the complex nature of land use problems that are slowly improving over time.

3.4 United States Environmental and Nutritional Challenges

While the impact of agriculture on water resources (2.48), animal feed and aggressive biofuel policies (2.43) (GAO 2016b, 2017a) present obstacles to national policy, poor personal food selection of products high in sugar and fat are leading challenges for Americans (BCFN 2016c). Heart disease continues to be at the top leading causes of death for Americans despite a reported 61% decline between 1975 and 2015 from 431.2 to 168.5 deaths per 100,000 population; however, an uptick between 2014 (167.0) and 2015 (168.5) represents reason for pause for the persistent health problem (National Center for Health Statistics, 2017, p.4).

Table 3.3 reflects insufficient progress reflected in nutritional challenges including dietary patterns with high sugar diets (0) and too much access to fast food with little nutritional value (0). Further, the combination of poor food intake and low physical activity (10.91) and prevalence of overnourishment (14.90) reduces life quality and expectancy (BCFN 2016b).

Table 3.3 The ugly: poor progress results of the United States Food Sustainability Index Report, 2016 (The Economist Intelligence Unit and the Barilla Center for Food & Nutrition 2016b)

Categories	United States	Food Loss and Waste	Sustainable Agriculture	Nutritional Challenges
End User-Waste	Food loss at end user	9.34		
Water Resources	Environmental impact of agriculture on water		2.48	
Land	Impact of land of animal feed and biofuels		2.43	
	Land use		30.82	
	Land users		31.44	
	Agricultural subsidies		0	
Life Expectancy	Prevalence of over nourishment			14.90
	Physical activity levels			10.91
Dietary Patterns	Prevalence of sugar in diets			0
	Number of people per fast food restaurant			0

Note: Scale 67+ positive direction for existing policy and practices; 34–67 Marginal progress; 0–33 reflect little or no progress towards sustainable practices

3.5 Summary

This chapter introduces some of the persistent and emerging topics of environmental conditions impacting public health, such as food sustainability and land use, posing areas for improvement demonstrated in the Food Sustainability Index (FSI). While this chapter focused on US results, the FSI serves as an international performance metric developed by the Barilla Center for Food & Nutrition. The FSI objective is to determine national progress on three facets of climate change—food loss and waste, sustainable agriculture, and nutrition on the global ecosystem. International comparisons demonstrate that despite superior ratings in some areas, such as food loss and air quality policy, the USA is lagging other nations in land, life quality, and life expectancy. However, the FSI report indicates that all 25 countries in the study have challenges to progress in a positive direction for multiple existing policy and practices. This chapter also provides additional recommended resources to enrich the foundation of public and international law.

Glossary

Environmental biodiversity The variety of species and organisms in an ecosystem

Food loss Products that are lost along the food supply chain for various reasons including spoilage and retail requirements for display

Land use Linked to several major areas of public administration such as natural resource management, waste disposal, transportation, urbanization, agriculture, recreation, and forest

Sustainable agriculture Environmentally friendly agriculture methods with the objective to preserve an ecological balance by avoiding natural resource depletion

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