Food Sustainability Index Methodology

The Food Sustainability Index (FSI), developed by the Economist Intelligence Unit (EIU) with the Barilla Center for Food & Nutrition (BCFN), measures the sustainability of food systems in 67 countries around three key issues outlined in the 2015 BCFN Milan Protocol and designed around the Sustainable Development Goals (SDGs): nutrition, sustainable agriculture and food loss and waste. The index looks at policies and outcomes around sustainable food systems and diets through a series of key performance indicators that consider environmental, social and economic sustainability.

This study defines sustainability as a food system's ability to maintain itself without depletion or exhaustion of its natural assets or compromises to its population's health, and without compromising future generations' access to food. The index seeks to address three main paradoxes identified in the 2015 BCFN Milan Food Protocol:

- Nutritional challenges: The hungry and the obese coexist, and rising rates of obesity strain healthcare systems to the point of economic unsustainability. For every person suffering from undernutrition, two are overweight or obese.
- Sustainable agriculture: Climate change impacts on agricultural systems are becoming more visible yet harder to estimate. Although agriculture has the potential to capture carbon emissions and help mitigate the impact of climate change, the ecological footprint of agriculture is growing. The shift away from fossil fuels to renewable sources of energy (e.g. biofuels) reduces the surface of land available to grow food.
- Food loss and waste: Almost one billion people suffer from hunger, but a third of food is lost or wasted. Food waste corresponds to four times the amount needed to feed the people suffering from undernutrition worldwide.

The Food Sustainability Index research programme aims to raise governments', institutions' and the general public's awareness around the need to address food sustainability issues and monitor progress towards addressing these issues. This project also supports global efforts around the SDGs. The index is linked not only to the SDG on hunger but also to those on climate change, life on land, sustainable cities, employment, responsible consumption and production, as well as gender equality, good health, poverty, education and infrastructure.

Scoring criteria and categories

The Milan Protocol defined the three primary categories in the index—Nutritional challenges, Sustainable agriculture and Food loss and waste. The individual indicators and underlying metrics were selected based on EIU expert knowledge and analysis, consultation with external food sustainability and nutrition experts, and with input from BCFN and their Advisory Board members. The Index contains 37 indicators, and 89 individual metrics, organised across these three categories. Each category receives a score, calculated from a weighted mean of the underlying indicator scores (see "Weights"), and scores are scaled from 0 to 100, where 100 = the highest sustainability and greatest progress towards meeting environmental, societal and economic KPIs.

Country selection

In 2018, the EIU and BCFN, in consultation with experts, decided to broaden the FSI's country scope to include 33 new countries in addition to the existing 34. This decision creates a more holistic picture of food systems across Europe and Sub-Saharan Africa. The new countries are highlighted in blue in the table below.

The FSI now evaluates food sustainability in 67 countries. The country choice reflects a mix of high income, middle-income and low-income economies, with geographic representation. These countries represent over 90% of global GDP and over four-fifths of the global population. The countries fit into the following income groups, as defined by the World Bank[1]:

High Income Economies (35 countries) – GNI per head $12,056 or higher

Sub-Saharan Africa	Asia Pacific	Europe and Central Asia	Latin America	Middle East and North Africa	North America
	Australia, Japan, South Korea	**Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland,** France, Germany, Greece, Hungary, **Ireland,** Italy, **Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland,** Portugal, **Slovakia, Slovenia,** Spain, Sweden, United Kingdom	Argentina	Israel, Saudi Arabia, United Arab Emirates	Canada, United States

Middle Income Economies (23 countries) – GNI per head $996 to $12,055

Sub-Saharan Africa	Asia Pacific	Europe and Central Asia	Latin America	Middle East and North Africa	North America
Cameroon, Cote d'Ivoire, Ghana, Kenya, Nigeria, South Africa, **Sudan, Zambia**	China, India, Indonesia	**Bulgaria, Romania,** Russia, Turkey	Brazil, Colombia, Mexico	Egypt, Jordan, Lebanon, Morocco, Tunisia	

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[1] World Bank. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

Low Income Economies (9 countries) – GNI per head $995 or lower

Sub-Saharan Africa
Burkina Faso, Ethiopia, **Mozambique, Rwanda, Senegal, Sierra Leone, Tanzania, Uganda, Zimbabwe**

Weights

The weights assigned to each category and indicator can be changed in the Food Sustainability Index model to reflect different assumptions about their relative importance. The model provides three sets of weights.[2]

- Expert-assigned weights
- Uniform weights
- SDSN-alignment statistical weights

The weights defined by BCFN and the EIU are the default setting. They are based on extensive discussions between BCFN, the EIU and the BCFN Advisory Board on the relative value of each indicator and sub indicator. The second weighting option, called uniform weights, assumes equal importance of all categories and evenly distributes weights on that basis.

The first option, the default weighting scheme, uses expert judgment to assign weights to indicators and brings a real-world perspective to an index. This is important if an index is to guide policy actions. The second option—in which all categories are weighted equally—has the advantage of simplicity and does not involve subjective judgment. A disadvantage of this option is that it assumes that all categories are equally significant.

A third weighting option is SDSN-alignment statistical weights. These weights are based on statistical analysis conducted by the University of Siena and are designed to reduce collinearity among underlying indicators and create alignment with the Sustainable Development Solutions Network SDG database. These weights aim to minimize redundancy between variables, but do not consider indicators' perceived importance.

Customisable weightings
The FSI model provides an adjustable weightings functionality that allows users to assign more or less importance to themes and indicators that they deem to be more relevant. Using this functionality can help users who are interested in regional analysis better understand country performance across areas of interest.

Methodology for statistical weightings
For the third weighting option based on statistical analysis, the weights attributed to the items within each category are calculated using the approach proposed by Betti and Verma (1999). In this approach, the weights are determined considering their correlation with the other items in a given category (correlation weights). Low weights are given to the items that

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[2] Download the 2018 FSI Excel model from http://foodsustainability.eiu.com/heat-map/

are highly correlated within a given category to limit the effect of redundancy and arbitrariness in assigning weights to the indicators.

1. Even for the overall index, it is reasonable to consider this correlation separately within each of the three pillars (i.e. to take the weight of item k in pillar δ as the inverse of an average measure of its correlation with items in that pillar).
2. This kind of weight can be computed as:

$$w_k^b \propto \left(\frac{1}{1 + \sum_{k'=1}^{K} \rho_{k,k'} | \rho_{k,k'} < \rho_H} \right) x \left(\frac{1}{\sum_{k'=1}^{K} \rho_{k,k'} | \rho_{k,k'} \geq \rho_H} \right)$$

where $\rho_{k,k'}$ is the correlation coefficient between the two indicators corresponding to items k and k'. In the first factor of the equation, the sum is taken over all indicators whose correlation with variable k is less than a certain threshold ρ_H (determined, for instance, by the point of largest gap between the ordered set of correlation values encountered).

3. The EIU has created four different levels of metrics in the model (categories, indicators, sub-indicators and sub-sub indicators). The weights have been assigned to sub-indicators (e.g., 1.2.1).
4. Weights for the indicators (e.g., 1.1) and categories have been assigned in order to minimize the distance of countries' ranks with the countries' ranks of FSI 2017.

Food Sustainability Index expert-based weightings

DOMAINS	Weight %
A) FOOD LOSS AND WASTE	33.3%
B) SUSTAINABLE AGRICULTURE	33.3%
C) NUTRITIONAL CHALLENGES	33.3%

MAIN CATEGORIES	Weight %
A) FOOD LOSS AND WASTE	
1) Food loss	66.7%
2) End-user waste	33.3%
B) SUSTAINABLE AGRICULTURE	
3) Water	28.6%
4) Land (land use, biodiversity, human capital)	42.9%
5) Air (GHG emissions)	28.6%
C) NUTRITIONAL CHALLENGES	
6) Life quality	40.0%
7) Life expectancy	30.0%
8) Dietary patterns	30.0%

INDICATORS	Weight %
1) Food loss	
1.1) Food loss	37.5%
1.2) Policy response to food loss	30.0%
1.3) Causes of distribution-level loss	32.5%
2) End-user waste	
2.1) Food waste at end-user level	50.0%
2.2) Policy response to food waste	50.0%
3) Water	
3.1) Environmental impact of agriculture on water	12.7%
3.2) Sustainability of water withdrawal	25.5%
3.3) Water scarcity	18.2%
3.4) Water management	23.6%
3.5) Trade impact	10.9%
3.6) Sustainability of fisheries	9.1%
4) Land (land use, biodiversity, human capital)	
4.1) Environmental impact of agriculture on land	10.5%
4.2) Land use	7.5%
4.3) Impact on land of animal feed and biofuels	6.0%
4.4) Land ownership	7.5%
4.5) Agricultural subsidies	7.5%
4.6) Animal welfare policies	5.6%
4.7) Diversification of agricultural system	9.4%
4.8) Environmental biodiversity	9.4%
4.9) Agro-economic indicators	11.2%
4.10) Productivity	7.5%
4.11) Land-users	6.7%
4.12) Financial access and protections for land-users	11.2%
5) Air (GHG emissions)	
5.1) Environmental impact of agriculture on the atmosphere	33.3%
5.2) Climate change mitigation	26.7%
5.3) Opportunities for investing in sustainable agriculture	40.0%
6) Life quality	
6.1) Prevalence of malnourishment	40.0%

6.2) Micronutrient deficiency	31.4%
6.3) Enabling factors	28.6%
7) Life expectancy	
7.1) Health life expectancy	26.5%
7.2) Prevalence of over-nourishment	30.1%
7.3) Impact on health	24.1%
7.4) Physical activity	19.3%
8) Dietary patterns	
8.1) Diet composition	26.9%
8.2) Number of people per fast food restaurant	24.4%
8.3) Economic determinant of dietary patterns	20.5%
8.4) Policy response to dietary patterns	28.2%

SUB-INDICATORS	
1.1) Food loss	
1.1.1) Food loss as % of total food production of the country	100.0%
1.2) Policy response to food loss	
1.2.1) Quality of policies to address food loss	100.0%
1.3) Causes of distribution-level loss	
1.3.1) Quality of the road infrastructure	100.0%
2.1) Food waste at end-user level	
2.1.1) Food waste per capita per year	100.0%
2.2) Policy response to food waste	
2.2.1) Quality of policy response to food waste	100.0%
3.1) Environmental impact of agriculture on water	
3.1.1) Water footprint	100.0%
3.2) Sustainability of water withdrawal	
3.2.1) Agricultural water withdrawal as % of total renewable water resources	100.0%
3.3) Water scarcity	
3.3.1) Baseline water stress	33.3%
3.3.2) Groundwater stress	66.7%
3.4) Water management	
3.4.1) Are there any initiatives to recycle water for agricultural use?	100.0%
3.5) Trade impact	
3.5.1) Virtual Blue Water Net Imports (crops and animal production)	100.0%

3.6) Sustainability of fisheries	
3.6.1) Fish stocks overexploited or collapsed (%)	100.0%
4.1) Environmental impact of agriculture on land	
4.1.1) Nitrogen Use Efficiency	31.7%
4.1.2) Soil quality for crop production	36.5%
4.1.3) Average carbon content of soil as a % of weight	31.7%
4.2) Land use	
4.2.1) Arable land under organic agriculture as % of agricultural land	29.8%
4.2.2) % of utilised agricultural area of total agricultural area	29.8%
4.2.3) Are there any sustainable urban farming initiatives?	40.4%
4.3) Impact on land of animal feed and biofuels	
4.3.1) First and second generation biofuel production	31.7%
4.3.2) Land diverted to animal feed and biofuels	36.5%
4.3.3) Biodiesel imports	31.7%
4.4) Land ownership	
4.4.1) Land owned/under concession abroad (% of domestic arable land)	29.9%
4.4.2) Degree of property rights protection	35.1%
4.4.3) Laws to protect smallholders	35.1%
4.5) Agricultural subsidies	
4.5.1) Quality of agricultural subsidies	100.0%
4.6) Animal welfare policies	
4.6.1) Quality of animal welfare regulation	100.0%
4.7) Diversification of agricultural system	
4.7.1) Share of top 3 crops of total agriculture production	100.0%
4.8) Environmental biodiversity	
4.8.1) Environmental biodiversity	36.6%
4.8.2) Deforestation (ha/year)	32.9%
4.8.3) Forest area (% of total land)	30.5%
4.9) Agro-economic indicators	
4.9.1) Government R&D expenditures (% of GDP)	50.0%
4.9.2) Public support to R&D	50.0%
4.10) Productivity	
4.10.1) Total factor productivity (TFP) growth rate	100.0%
4.11) Land-users	
4.11.1) Participation rate of women in farming	21.6%

4.11.2) Participation rate of youth in farming	16.0%
4.11.3) Average age of farmers	18.4%
4.11.4) Average education level of farmers	22.4%
4.11.5) Working conditions of workers in agriculture and along the value chain	21.6%
4.12) Financial access and protections for land-users	
4.12.1) % of rural population with a bank account	30.0%
4.12.2) % of rural population that made/received digital payments	30.0%
4.12.3) Availability of insurance for farmers	40.0%
5.1) Environmental impact of agriculture on the atmosphere	
5.1.1) GHG emissions from agriculture	23.0%
5.1.2) % animal emissions from total emissions in agriculture	31.0%
5.1.3) % fertilizer emissions from total emissions in agriculture	26.4%
5.1.4) Net emissions/removals (CO2eq) from land use total	19.5%
5.2) Climate change mitigation	
5.2.1) Climate change response techniques	100.0%
5.3) Opportunities for investing in sustainable agriculture	
5.3.1) Sovereign debt risk	33.3%
5.3.2) Opportunities for investing in sustainable agriculture	66.7%
6.1) Prevalence of malnourishment	
6.1.1) Prevalence of undernourishment (% of population)	26.3%
6.1.2) % of stunted children under 5 years old (height for age)	23.7%
6.1.3) Prevalence of wasting, weight for height (% of children under 5)	23.7%
6.1.4) Prevalence of underweight, weight for age (% of children under 5)	26.3%
6.2) Micronutrient deficiency	
6.2.1) Vitamin A deficiency (% of general population)	100.0%
6.3) Enabling factors	
6.3.1) % of babies under 6 months old exclusively breastfed	50.0%
6.3.2) Access to improved water source	50.0%
7.1) Health life expectancy	
7.1.1) Life expectancy at birth, total (years)	46.0%
7.1.2) Healthy life expectancy (HALE)	54.0%
7.2) Prevalence of over-nourishment	
7.2.1) Prevalence of overweight in children (5-19 years of age)	50.0%
7.2.2) Overweight (body mass index >= 25) (age-standardized estimate)	50.0%
7.3) Impact on health	

7.3.1) Disability Adjusted Life Years (DALYs)	100.0%
7.4) Physical activity	
7.4.1) % of population reaching recommended physical activity weekly	56.7%
7.4.2) Hours of inactivity as measured by fixed screen time per week	43.3%
8.1) Diet composition	
8.1.1) % of sugar in diets	34.1%
8.1.2) Meat consumption levels	22.7%
8.1.3) Saturated fat consumption	14.8%
8.1.4) Salt consumption	28.4%
8.2) Number of people per fast food restaurant	
8.2.1) Number of people per fast food restaurant	100.0%
8.3) Economic determinant of dietary patterns	
8.3.1) Proportion of population living below the national poverty line	46.5%
8.3.2) GINI Coefficient	53.5%
8.4) Policy response to dietary patterns	
8.4.1) Quality of policy response to dietary patterns	50.0%
8.4.2) Compulsory nutrition education	50.0%

Data modelling

Indicator scores are normalised and then aggregated across categories to enable a comparison of broader concepts across countries. Normalisation rebases the raw indicator data to a common unit so that it can be aggregated. All indicators in this model are normalised to a 0 to 100 scale, where 100 indicates the highest sustainability and 0 represents the lowest.

Most indicators are transformed based on a min/max normalisation, where the minimum and maximum raw data values across the 67 countries are used to bookend the indicator scores. The indicators for which a higher value indicates a more favourable environment have been normalised based on:

$$x = (x - Min(x)) / (Max(x) - Min(x))$$

where Min(x) and Max(x) are, respectively, the lowest and highest values in the 67 countries for any given indicator. The normalised value is then transformed from a 0-1 value to a 0-100 score to make it directly comparable with other indicators. This in effect means that the country with the highest raw data value will score 100, while the lowest will score 0 for all indicators in the Index.

For the indicators for which a high value indicates an unfavourable environment, the normalisation function takes the form of:

x = (x - Max(x)) / (Min(x) - Max(x))

where Min(x) and Max(x) are, respectively, the lowest and highest values in the 67 countries for any given indicator. The normalised value is then transformed into a positive number on a scale of 0-100 to make it directly comparable with other indicators.

Comparability against the FSI 2017

The EIU acknowledges that the debate around food sustainability is dynamic and on-going. As such, the EIU revises the FSI indicator framework every year based on feedback received on previous methodologies and on new evidence that becomes available. This means that the overall results of the FSI 2018 are not directly comparable to those of the FSI 2017.

The 2018 framework updates address two key objectives:

1. To improve the discussion around food sustainability - Feedback from the 2017 FSI highlighted that socio-economic indicators and opportunities for investing in sustainable agriculture were missing from the framework. Ensuring sustainable livelihoods for farmers is a critical component of establishing a strong, resilient and maintainable agricultural sector.
2. To better align with the Sustainable Development Goals (SDGs) - the SDGs are a global call to action centred on ending poverty, preserving natural resources and ensuring healthy, safe lives for all. The SDGs have become a set of common targets embraced by stakeholders globally. Governments, the private sector, civil society organisations and multilaterals are using the SDGs to determine their investment and policy priorities. If the FSI is to be a decision-making tool for stakeholders, alignment with the SDG targets and indicators is critical.

To address these objectives, the EIU and BCFN incorporated new indicators, revised existing indicator sources and methodologies and, as necessary, removed indicators.

New indicator additions[3]:
- **Access to finance (4.12 Financial access and protections for land users)**- Financial inclusion is important for farmers as financial services, such as savings accounts, enable farmers to provide evidence of their production in order to obtain loans. To incorporate financial inclusion for farmers, the EIU has added in SDG indicator 8.10.2, 'Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider', which uses data from the World Bank.
- **Access to Fintech (4.12 Financial access and protections for land users)**- Advancements in Fintech are important for farmers as leveraging technological developments enables them to reduce transaction costs for example, through using electronic payment platforms. To incorporate farmers' access to Fintech, the EIU has

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[3] References and source links for each metric used in the 2018 FSI are available in the Excel model. Please download the model to learn more: http://foodsustainability.eiu.com/heat-map/

added a World Bank indicator that measures the percentage of the rural population that made or received digital payments in the past year.

- **Protection for land-users (4.12 Financial access and protections for land users)**- One of the critical areas of social and economic access for farmers is access to insurance, which enables farmers to protect themselves against risks to their crops. The EIU found, after a review of sources (including the World Bank, FAO, insurance companies and academic journals), that there is no quantitative data on access to insurance available by country. Therefore, the EIU has added in a qualitative indicator (see indicator 4.12.3). The indicator measures the level of crop insurance available to farmers from either public or private actors. More details on scoring can be found in the Detailed indicator list.

- **Sovereign debt risk (5.3 Opportunities for investing in sustainable agriculture)**- Sovereign debt is debt issued by the national government in a foreign currency in order to finance the issuing country's growth and development. A country's sovereign credit ratings provide an indicator of the stability of the issuing government, which help investors weigh risks when assessing sovereign debt investments. The EIU's proprietary sovereign debt risk metric looks at the probability a country will default on its debt in the next year. It is a baseline for understanding whether or not the private sector and NGOs will be willing to funnel money into a country and assesses the probability that investments will generate returns. If sovereign debt risk is too high, it is unlikely that an investor will consider investing in sustainable agriculture opportunities in the country, even if such opportunities exist.

- **An opportunity for investing in sustainable agriculture (5.3 Opportunities for investing in sustainable agriculture)** - This indicator assesses countries' progress in facilitating investment into sustainable agricultural activities by private sector stakeholders. The EIU has framed the indicator in a manner that it incorporates two angles to accommodate both developed and developing economies: the first looks at the enabling environment for private sector participation by examining whether a policy or strategy exists that promotes private sector investment in sustainable agriculture. The second looks at the actual level of private sector participation by looking at the number of case studies or projects. Additional details can be found in the detailed indicator list.

- **Forest area (4.8 Environmental biodiversity)** - Deforestation represents a major threat to ecological conservation due to its potential to escalate habitat loss, loss of livelihood for those employed in forest management as well as disturbance to ecological systems. Conservation of forest cover to keep these effects in check is a priority area for the international community. According to the World Bank, sustained tree-planting efforts have helped mitigate the net loss of forest area globally, also aided by natural expansion of forests in some countries. The EIU included this indicator, in addition to indicator 4.8.2 which looks at deforestation, in order to recognise countries that are partaking in these efforts. Forest area is defined as land under natural or planted stands of trees of at least 5 meters in situ, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agroforestry systems) and trees in urban parks and gardens.

- **Groundwater stress (3.3 Water scarcity)** - The EIU added in this metric from the World Resources Institute[4] to address issues around water insurance. The OECD notes how mismanagement of water resources, especially groundwater, is one of the biggest risks to agriculture. Water insurance is a new concept that focuses on protecting against risks of groundwater depletion. Groundwater stress measures the relative ratio of groundwater withdrawal to recharge rate.

Revised indicators and sources:
- In cases where the FSI framework overlaps with the Sustainable Development Goals' indicators and targets or with the Sustainable Development Solutions Network (SDSN), the EIU has replaced sources from the 2017 FSI with the sources used by the SDSN. These changes reflect the push towards global alignment on issues around hunger, nutrition, resource conservation, responsible production and climate action. These source changes can be found across the following metrics: 3.6.1, 4.9.1, 6.1.1, 6.1.2, 6.1.3, 6.3.2 and 8.3.2.
- **Food waste per capita per year (2.1 Food waste at end-user level)** - In the 2017 FSI, the EIU used research drawn from news articles and other secondary sources to estimate food waste. This year, the EIU has used a methodology from a 2011 FAO study (available here) to build out food waste estimates at the country level with the most recent data available from the FAO.
- **Baseline water stress (3.3 Water scarcity)** - The EIU replaced Mekonnen and Hoekstra's data (2011) on "monthly freshwater scarcity" with WRI data on baseline water stress. The Mekonnen and Hoekstra's data is unlikely to be updated in the near future, while the WRI data is expected to be updated in 2018.
- **Current health expenditure per capita** (current US$) - The EIU replaced "Public and private healthcare expenditure per capita (current US$)" with this updated indicator from the World Bank since the World Bank no longer publishes public and private spending.
- **Percentage of sugar in diets (8.1 Diet composition)** - In 2017, data to score this indicator was pulled from National Geographic's 'What the World Eats'. However, as this source has very limited country coverage and uses older FAO data than available on FAO food balance sheets, the 2018 FSI pulls data from FAO food balance sheets for all countries (specifically data on food supply (kcal/capita/day)). The indicator looks at total food supply of sugar, honey and sweeteners over total food supply.
- **Percentage of population reaching recommended physical activity per week (7.4 Physical activity)** – In 2017, the FSI used research drawn from news articles and other secondary sources to estimate the percentage of population reaching recommended physical activity per week. In 2018, the FSI switched sources to use data published in 2018 by the Lancet Global Health, which measures the levels of insufficient physical activity across 168 countries. From this, the EIU derived the percentage of population reaching sufficient physical activity.
- **Disability adjusted life years (DALYs) (7.3 Impact on health)** - In 2017, this indicator looked at the total number of DALYs from nutritional deficiencies, cardiovascular diseases and diabetes in each country. This approach, however, does

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[4] Data years and source links for each metric used in the 2018 FSI are available in the Excel model, Please download the model to learn more: http://foodsustainability.eiu.com/heat-map/

not take into account the relative size of a country's population and the number of productive years of life lost per person from poor nutrition or over nutrition. In the 2018 index, the EIU has divided the total number of DALYs by a country's population to understand relatively how each member of the population is impacted. Population data is pulled from the United Nations Population Division World Population Prospects.

● **Number of people per fast food restaurant (8.2 Number of people per fast food restaurant)** – The addition of a substantial number of countries in Sub-Saharan Africa, where fast food restaurant penetration is low, to the 2018 country scope necessitated a shift in methodology. In previous editions of the index, this indicator used McDonalds, Kentucky Fried Chicken and Burger King franchises as a proxy for the number of fast food restaurants in each country. This year, the index only considers McDonalds and Kentucky Fried Chicken franchises (the two largest fast food chains globally). The EIU removed Burger King, which has not yet expanded into Sub-Saharan Africa, to not further skew the results in favour of countries in that region. In cases where there are currently no franchises in a country (eg, Burkina Faso and Sierra Leone), the EIU assigned the country a capped value. This capped value results in those countries receiving the top score once the data is normalised.

● **Processed food taxes (8.4 Policy response to dietary patterns)** - In the 2017 index, this sub-indicator was scored using a binary scoring scheme (i.e., 1 = Yes, a country has taxes on processed food or 0 = No, a country does not have taxes on processed foods). However, with the addition of 13 additional Sub-Saharan African economies to the country scope in 2018, the EIU has refined this binary approach to take into account the current need for nutrition interventions. Countries that have taxes on processed food receive full credit. In cases where a country does not have taxes in place, a score from 0-.99 has been assigned based on the percentage of the adult population in the country that is overweight. In cases where a larger portion of the population is overweight, the EIU applied a lower figure.

● **Input subsidies (8.4 Policy response to dietary patterns)** - In the 2017 index, this sub-indicator was scored using a binary scoring scheme (i.e, 1 = No, a country does not have subsidies on processed food inputs or 0 = Yes, a country does have subsidies on processed food inputs). However, with the addition of 13 additional Sub-Saharan African economies to the country scope in 2018, the EIU has refined this binary approach to take account the current need for nutrition interventions. Countries that do not have input subsidies receive full credit. In cases where a country does have input subsidies in place, a score from 0-.99 has been assigned based on the percentage of the adult population in the country that is overweight. In cases where a larger portion of the population is overweight, the EIU applied a lower figure.

● **Policy response to food loss** and **policy response to food waste** - If a country was in the top 25% of scores (top 17 countries) on the food loss indicator (1.1.1) or food waste indicator (2.1.1) respectively, the country received full credit on the policy response indicators. This decision accounts for the fact that countries that have low levels of food loss or low levels of food waste might not be prioritising these issues in policy development.

● **Other qualitative indicators** – To accommodate the expanded 2018 FSI country scope, the EIU reviewed each qualitative indicator to ensure that every question in the index was relevant to both developing and developing economies. As necessary,

the EIU altered indicator questions, scoring guidance and scoring schemes. For example, in the 2017 index sub-indicator 2.2.1.9 asked, "Does the country respect the food recovery hierarchy?" The food recovery hierarchy is the United States' waste prioritisation framework. Recognising that most developing countries were unlikely to have adopted the same approach as the US, the 2018 index expanded the question to include any food waste prioritisation framework: "Does the country have a national and/or international framework that prioritises the most sustainable ways to prevent and reuse wasted food?" Because of these types of changes, countries' scores on qualitative indicators might have shifted from 2017 to 2018. The FSI 2018 Excel model provides justifications and sources for each qualitative score.

Removed indicators:
- **Investment in transport** - In the 2017 index, this indicator drew on data from both the OECD and the World Bank. The OECD data, which covers the majority of developed countries in the index, looks at all transport investment and maintenance spending, although many countries exclude private spending from their data. The World Bank data, which specifically covers developing countries, looks at investment in transport infrastructure with private participation (eg, public-private partnerships and large on-off investments). Historically, the World Bank data has been as a proxy for countries where OECD data was unavailable. The expanded country scope in the 2018 index resulted in the need for proxies in an increased number of countries. The EIU did not feel comfortable using a data set where half of the countries were scored using the OECD data and half were scored using the World Bank data, as these two data sets do not create like-for-like comparisons. The EIU will search for transport investment datasets with more comprehensive country coverage for future editions of the FSI.
- **Iodine deficiency** - Given the wider range of country coverage, the data on iodine deficiency is limited. The dataset from WHO only gives data at a national level for less than half of the 67 countries, with only ten of these countries recording data in the last 15 years. The EIU looked further to see if it was possible to use an alternative indicator, including looking at access to iodised salt, but found a similar shortage of data. The data with the best country coverage availability is the Iodine Global Network, but the age sample of the data varies significantly across countries. In order to ensure comparability among data within the index, the EIU has moved the iodine deficiency metric to the background indicators (using data from the Iodine Global Network) for user reference.

Future areas to progress:
The review included looking at indicators for which SDG initiatives might encourage data collection in the future. These indicators have been included as background indicators with the hope that they may have wider country coverage in the future and will be able to be integrated into the core of the index. Additional information is provided below.

One critical area of social and economic access for farmers is access to credit. Access to credit enables farmers to invest in infrastructure and technology to increase productivity. The EIU found that existing data sets on access to credit do not have extensive country coverage. The most promising indicator found was the Agricultural Orientation Index (AOI)-- an indicator designed to measure progress towards SDG Target 2.a.1 (Public Investment in

Agriculture). The AOI includes a measure on agricultural credit. Only 37 of the FSI countries are currently included in the existing AOI data set. However, the EIU expects that additional data will be collected in the future as countries begin tracking their progress towards SDG Target 2.a. The EIU has included 'Access to credit for farmers' as a background indicator, and will fill in this indicator when data becomes available in future years.

Another aspect of social and economic access for farmers considered in the FSI 2018 was minimum wages for farmers. A review of sources including the World Bank, ILO, FAO, OECD and the Overseas Development Institute, confirmed that national-level minimum wages are rarely set by sector and, for federal states, are often set at the state level. In the agriculture sector, this issue is further complicated by the levels of informal employment. The EIU and BCFN decided to use the proportion of the rural population living below the national poverty line as a proxy for the economic well-being of agricultural workers. However, this data is also currently scant across countries: only 25 of the FSI countries are included. Given rural poverty is included among the SDG indicators, the EIU is hopeful that the data will be available in the future. The EIU has included this indicator in the background series and hopes to incorporate it into the main framework as more comprehensive data on rural poverty becomes available in the future.

Data limitations

The EIU employed country experts and regional specialists with a wide variety of necessary linguistic skills to undertake the research from its global network of more than 350 analysts and contributors. Researchers were asked to gather data from primary legal texts; government and academic publications; and websites of government authorities, international organisations, and non-governmental organisations. In some cases, the EIU research was constrained by data availability.

Up-to-date data

Data on national water footprints of countries, which comes from Mekonnen & Hoekstra's National Water Footprint Accounts, is 1996-2005. The EIU uses data from this study for indicator 3.3.1) Water footprint and indicator 3.5.1) Virtual Blue Water Net Imports. The EIU conducted a data scan to identify other datasets that look at countries' use of water, but were unable to identify more up-to-date sources with substantial country coverage. Data on current water footprint is an important component of understanding a country's resource management, and should be a priority for researchers moving forward.

Quantitative datasets on soil quality (see 4.1.2 Soil quality for crop production) are old. The EIU uses the global survey on human-induced soil degradation is the GLASOD (Global Assessment of Human-Induced Soil Degradation), prepared jointly by ISRIC and UNEP during the 1980's, and available through the FAO. The GLASOD database is the only global dataset available on soil degradation. The FAO is in the process of developing the GLADIS dataset, which will provide up-to-date statistics on soil degradation.

There is limited data available on micronutrient deficiencies (a detailed discussion of such data gaps are discussed in greater detail on page 19). The EIU uses data from the World Health Organisation on the percentage of the population that suffers from Vitamin A

deficiency (see 6.2.1 Vitamin A deficiency). This data is from 1995-2005. More up-to-date datasets with substantial country coverage do not exist.

Regional nuances
The value of an index is that it produces like-for-like comparisons across a set of geographies. It is important to note, however, that not all sustainability issues and metrics are equally important in every geography.

For example, climate has an impact on the amount of food loss across the supply chain. In warmer countries (for example, the Mediterranean), food degradation occurs more rapidly. This rapid degradation and the risk the climate poses to food supply in a country make managing food loss and waste more important in warmer countries. The index cannot distinguish between those countries where climate poses a higher threat to food loss and waste and those where climate is more conducive to minimising degradation. Further research is needed to understand how to overcome this limitation.

Specific country data gaps
Among the indicators constituting this year's index, about 60% are quantitative and rely on centralised data sources. There is considerable variability in the availability of data across these sources, resulting in data gaps for some of the indicators. The EIU employed a number of approaches to fill these data gaps and used the approach most applicable to each indicator. Decisions were made based on consultations with the EIU's Economics Team.

Combining regional and income averages: This approach represents a reliable and logical solution to gap filling that replicates the real world as closely as possible. For every country that had gaps, a 3-step methodology was used:

1. Every country in the index was classified into an income category and a regional category in accordance with World Bank classifications.
2. Countries classified into the required income and regional categories were filtered and an average of these countries was calculated.
3. This average was assigned to a country with the corresponding income and regional classification.

Country proxies: In some cases, data gaps were addressed by applying a country proxy - where one country, rather than an average of multiple countries, is used as a direct proxy for another. This approach was used when two countries were considered more closely aligned than an average based on a discussion of geographic, economic, demographic and political similarities.

Data limitations specific to each category of the 2018 FSI are outlined below.

Estimations
End-user food waste: In the 2017 index, estimates of food waste were based on qualitative research sourced from news articles, reports, academic studies and government statistical portals. This method was developed to address the lack of a centralised database of food waste figures, and created quantitative proxies for each country. However, since these

estimates came from varied sources and the methodology used for each news article, report and source might not be transparent, there was a lack of comparability between the figures for each country.

The EIU undertook research to identify a new methodology to ensure like-for-like comparisons across the 67 countries in the index. The EIU found a methodology developed by the Food and Agriculture Organization of the United Nations (FAO) in partnership with the Swedish Institute of Food and Biotechnology (SIK) in its paper released in 2011 titled *Global food losses and food waste – Extent, causes and prevention*. The EIU has recreated this methodology using data from the FAO Food Balance Sheets (latest data available from 2013).

This approach defines end-user food waste as losses occurring at the final stages of the food chain, namely at the retail and final consumption stages. The FAO methodology defines five stages in the food supply chain including agricultural production, post-harvest handling and storage, processing, distribution, and consumption. For the purpose of calculations, the EIU used the same commodity classifications defined by the FAO. For each commodity group, a mass flows model was used to calculate food losses and waste in each step of the commodity's food supply chain. After the calculation of losses and waste, respective regional conversion factors were applied to each commodity group to estimate the total edible waste in each country. These conversion factor estimates are derived from a SIK paper (available here) that has a detailed outline of the methodology. As a final step, the EIU used its in-house data on population (for 2013) to calculate per capita estimates of end-user food waste.

It must be noted that this approach is limited by the lack of availability of recent data (the FAO Balance Sheets data is from 2013). However, it offers a robust, comparable set of estimates to quantify end-user food waste that are crucial for policy discussions around more sustainable food systems.

Micronutrient deficiencies and diet composition
Data on micronutrient deficiencies and diet composition are not updated frequently. There are substantial gaps in many of the data sets that cover micronutrients and diets. Finding robust metrics with complete country coverage has been difficult. The EIU has incorporated data that does exist and uses metrics around the prevalence of stunting and underweight children, consumption habits and disability-adjusted life years to assess nutritional deficiencies (see indicators 6.1 Prevalence of malnourishment, 7.2 Prevalence of overnourishment, 7.3 Impact on health and 8.1 Dietary patterns). This lack of micronutrient data, however, makes it difficult to track progress towards healthier populations, and represents a gap in understanding nutritional challenges. More research and data collection is needed for gauging the health of populations globally.

Qualitative indicators
In cases where quantitative datasets do not exist, or to assess a country's policy environment, the EIU has developed a series of qualitative metrics. Most of these qualitative metrics use binary scoring schemes (0, 1) to measure whether each country has a policy in place to, for example, tax processed foods or to cap subsidies. The value of these indicators is that they allow the EIU to design comparable metrics across countries that assess the

policy environment and stakeholder commitment to addressing food sustainability issues. They do not, however, allow the FSI model to capture the nuances of policies in each country (although, as feasible, the EIU has asked a series of questions about each policy to create more robust assessments). The normalisation of these indicators is skewed in that countries either receive a score of 100 or 0 for each of these metrics, which poses a challenge for those engaging in statistical analyses.

Sources and definitions

All of the quantitative and qualitative data in the Food Sustainability Index were collected and analysed by the EIU project team. Data were gathered from reputable international, national and industry sources including the EIU's internal databases. In cases where data were incomplete or missing, EIU analysts developed custom estimation models that aggregate proxy data series and use statistical analysis to estimate data points, where appropriate.

The main sources used in the FSI are: the Animal Protection Index; the BP Statistical Review of World Energy; the EIU; the European Commission; the FAO; the ITUC Global Rights Index; the Land Matrix; the SDG UNSTATS database; the Sustainable Development Solutions Network (SDSN); UN Comtrade; UNESCO; UNICEF; the World Bank Group; the World Health Organisation; the World Resources Institute; journal articles and studies by respected academics.

For any queries, please contact Katherine Stewart at katherinestewart@economist.com.

Detailed indicator list

The indicators and sub-indicators included in the Food Sustainability Index are:

Number	Indicator	Additional indicator information	Source	Year
A	**Food loss and waste**			
1.1	**Food loss**			
1.1.1	Food loss as % of total food production of the country		FAO	2013
1.2	**Policy response to food loss**			
1.2.1	Quality of policies to address food loss		EIU research	
1.2.1.1	Food loss strategy	Is there a national plan/strategy to reduce food loss? 0 = No 1 = Yes, the strategy addresses overall food loss but not different stages in the supply chain (pre-distribution) 2 = Yes, the strategy addresses specifically the different stages of the supply chain *In cases where a country has less than 2% of food loss in indicator 1.1, the country has received full credit.*	EIU research	
1.2.1.2	Storage solutions	Is there an NGO or international organisation doing any programme with smallholders to help them reduce food loss at farm level by providing safe storage solutions? 0 = No 1 = Yes *In cases where a country has less than 2% of food loss in indicator 1.1, the country has received full credit.*	EIU research	
1.3	**Causes of distribution-level loss**			
1.3.1	Quality of the road infrastructure		EIU Risk Briefing	2018
2.1	**Food waste at end-user level**			

2.1.1	Food waste per capita per year		EIU calculations derived from an FAO report and FAO data	2013
2.2	**Policy response to food waste**			
2.2.1	Quality of policy response to food waste		EIU Research	
2.2.1.1	Food waste strategy	Is there a food waste national strategy in place? 0 = No national plan or strategy 1 = Food waste is included in other national plans or strategies (e.g. in waste management plans) 2 = Food waste has its own national plan or strategy *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.2	Food waste targets	Are there any reduction or prevention quantitative targets or KPIs on end-user level food waste? 0 = No 1 = Yes *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.3	Market-based instruments	Does the country have market-based instruments for end-user level food waste? 0 = No 1 = Yes *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.4	Food waste legislation	Does the country have laws, regulations, and regulatory instruments for end-user level food waste? 0 = No 1 = No national level legislation, but the largest city and/or state (by population) has laws to reduce food waste 2 = National legislation and/or regulations to recycle food waste 3 = Good Samaritan-type of law (reducing liability of supermarkets for donating food) OR national legislation preventing supermarkets from throwing away food waste and instead obliging them to donate it *In cases where a country has less than*	EIU Research	

		5.7% of food waste in indicator 2.1, the country has received full credit.		
2.2.1.5	Food waste regulatory agency	Has the government assigned or created a body to oversee food waste regulations? 0 = No 1 = Yes, a body exists *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.6	Voluntary agreements	Are there any current voluntary agreements (agreements between a government authority and one or more private parties to achieve food waste objectives that go beyond compliance to legal instruments in place such as laws and regulations) to deal with food waste? 0 = No 1 = Yes *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.7	Private institutions	Are there any private and/or third-sector institutions to deal with food waste? (e.g. food banks, charities, retailers redistributing food or recycling it) 0 = No 1 = Yes, the largest city or state (by population) has such institutions 2 = Yes, there are national institutions *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.8	Food waste research	Is there any research being done by academic institutions such as universities or think tanks to advance knowledge on food waste reduction, prevention and management? 0 = No 1 = Yes *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	
2.2.1.9	Food waste prioritisation framework	Does the country have a national and/or international framework that prioritises the most sustainable ways to prevent and reuse wasted food? 0 = No 1 = Yes *In cases where a country has less than 5.7% of food waste in indicator 2.1, the country has received full credit.*	EIU Research	

B	Sustainable agriculture			
3.1	**Environmental impact of agriculture on water**			
3.1.1	Water footprint		Mekonnen & Hoekstra (2011) National Water Footprint Accounts	1996-2005
3.2	**Sustainability of water withdrawal**			
3.2.1	Agricultural water withdrawal as % of total renewable water resources		FAO Aquastat	2003-2017
3.3	**Water scarcity**			
3.3.1	Baseline water stress		WRI Aqueduct	2013
3.3.2	Groundwater stress		WRI Aqueduct	2013
3.4	**Water management**			
3.4.1	Initiatives to recycle water for agricultural use	Are there any initiatives to recycle water for agricultural use? 0 = No 1 = Yes	EIU Research	
3.5	**Trade impact**			
3.5.1	Virtual Blue Water Net Imports (crops and animal production)		Mekonnen & Hoekstra (2011) National Water Footprint Accounts, UNESCO-IHE	1996-2005
3.6	**Sustainability of fisheries**			

3.6.1	Fish stocks overexploited or collapsed		Bertelsmann Stiftung and Sustainable Development Solutions Network	2018
4.1	**Environmental impact of agriculture on land**			
4.1.1	Nitrogen Use Efficiency		Yale EPI	1961-2011
4.1.2	Soil quality for crop production		FAOSTAT GLASOD	1991
4.1.3	Average carbon content of soil as a % of weight		FAOSTAT	2008
4.2	**Land use**			
4.2.1	Arable land under organic agriculture as a % of agricultural land		FAOSTAT	2015
4.2.2	% of utilised agricultural area of total agricultural area		FAOSTAT	2015
4.2.3	Sustainable urban farming initiatives	Are there any sustainable urban farming initiatives? 0 = No 1 = Yes	EIU research	
4.3	**Impact on land of animal feed and biofuels**			
4.3.1	First and second generation biofuel production		BP Statistical Review of World Energy 2016	2017
4.3.2	Land diverted to animal feed and biofuels		EIU Calculation based on data from FAO	2015
4.3.3	Biodiesel imports		UN Comtrade	2017
4.4	**Land ownership**			

4.4.1	Land owned / under concession in foreign countries as a % of domestic arable land		EIU Calculation based on data from Land Matrix and FAO	2015; 2000-2017
4.4.2	Degree of property rights protection		EIU research	
4.4.3	Laws to protect smallholders		EIU research	
4.4.3.1	Land acquisition protection	Are there any laws to protect smallholders against land grabbing/land acquisition? 0 = No 1 = Yes	EIU research	
4.4.3.2	Formal land rights	Are there formal land rights granted to communities or individual smallholders? 0 = No 1 = Yes	EIU research	
4.5	**Agricultural subsidies**			
4.5.1	Quality of agricultural subsidies		EIU research	
4.5.1.1	Permanent subsidies	If the country has agricultural subsidies, are these subsidies permanent? 0 = Yes 1 = No OR the country does not have agricultural subsidies	EIU research	
4.5.1.2	Capped subsidies	If the country has permanent agricultural subsidies, does the country assign a capped amount per farmer? 1 = Yes or country does not have permanent subsidies 0 = No	EIU research	
4.5.1.3	Regressive subsidies	If the country has permanent agricultural subsidies, are these subsidies regressive after a given land plot size? 1 = Yes or country does not have permanent subsidies 0 = No	EIU research	
4.6	**Animal welfare policies**			
4.6.1	Quality of animal welfare regulation		API	2014
4.7	**Diversification of agricultural system**			

4.7.1	Share of top 3 crops of total agriculture production		EIU Calculation based on data from FAOSTAT	2016
4.8	**Environmental biodiversity**			
4.8.1	Environmental biodiversity		UNSTATS SDG database	2017
4.8.2	Deforestation (ha/year)		GFW	2017
4.8.3	Forest area (% of total land)		World Bank	2015
4.9	**Agro-economic indicators**			
4.9.1	Government R&D expenditures (% of GDP)		UNESCO	2016
4.9.2	Public support to R&D		EIU research	
4.9.2.1	Research institutions	Are there any public-supported agencies for research and technical assistance for producers? 0 = No 1 = Yes	EIU research	
4.9.2.2	Public financing	Is there any public financing available for agricultural innovation? 0 = No 1 = Yes	EIU research	
4.9.2.3	Budget coordinating body	Is there a dedicated public institution that coordinates the budget dedicated to agricultural innovation? 0 = No 1 = Yes	EIU research	
4.9.2.4	Training programmes	Are there any national or semi-national training programmes for farmers in sustainable agricultural practices? 1 = Yes 0 = No	EIU research	
4.10	**Productivity**			
4.10.1	Total factor productivity (TFP) growth rate		US Department of Agriculture	2011-17
4.11	**Land-users**			

4.11.1	Participation rate of women in farming		FAO	2011-17
4.11.2	Participation rate of youth in farming		World Bank, European Commission, EIU research	2010-18
4.11.3	Average age of farmers		European Commission, EIU research	2005-18
4.11.4	Average education level of farmers	What is the average education level of farmers? 0 = No education 1 = Primary school 2 = Secondary school 3 = Above secondary school	EIU research	
4.11.5	Working conditions of workers in agriculture and along the value chain		ITUC Global Rights Index	2018
4.12	**Financial access and protections for land-users**			
4.12.1	% of rural population with a bank account		World Bank	2017
4.12.2	% of rural population that made/received digital payments		World Bank	2017
4.12.3	Availability of insurance for farmers	What levels of crop insurance are available to farmers? 0 = No crop insurance options are available in the country 1 = Named peril insurance only is available 2 = Yield-based insurance or multi-peril crop insurance is also available 3 = Index based agricultural insurance or crop revenue Insurance is also available	EIU research	
5.1	**Environmental impact of agriculture on the atmosphere**			
5.1.1	GHG emissions from agriculture		FAOSTAT	2016
5.1.2	Animal emissions, total		FAOSTAT	2016
5.1.3	Fertilizer emissions, total		FAOSTAT	2016

5.1.4	Net emissions/removals (CO2eq) from land use total		FAOSTAT	2015
5.2	**Climate change mitigation**			
5.2.1	Climate change response techniques	Does the country have any initiatives of agricultural techniques for climate change mitigation and adaptation? 0 = No 1 = Yes	EIU research	
5.3	**Opportunities for investing in sustainable agriculture**			
5.3.1	Sovereign debt risk		EIU Country Risk Model	2017
5.3.2	Opportunities for investing in sustainable agriculture	Does the country have a national strategy/policy that promotes private sector investment in sustainable agricultural activities? 0 = No, such a strategy/policy does not exist OR there are no available case studies around private sector investment in the country. 1 = Yes, a strategy/policy on sustainable agriculture exists, but it does not incorporate measures for promoting private sector investment in sustainable farming OR there are no available case studies around private sector investment in the country. 2 = Yes, a strategy/policy on sustainable agriculture exists, and it incorporates specific measures for promoting private sector investment in sustainable farming OR there are available case studies around private sector investment in the country and those case studies mention specific investment targets.	EIU research	
C	**Nutritional challenges**			
6.1	**Prevalence of malnourishment**			
6.1.1	Prevalence of undernourishment (% of population)		FAO	2015
6.1.2	% of stunted children under 5 years old (height for age)		UNICEF	2001-2016/17

6.1.3	Prevalence of wasting, weight for height (% of children under 5)		UNICEF	2001-2016
6.1.4	Prevalence of underweight, weight for age (% of children under 5)		World Bank	2001-2016
6.2	**Micronutrient deficiency**			
6.2.1	Vitamin A deficiency (% of general population)		World Health Organisation	1995-2005
6.3	**Enabling factors**			
6.3.1	% of babies under 6 months old exclusively breastfed		World Bank for developing countries; EIU research for developed countries	2006/07-2016/17
6.3.2	Access to improved water source		World Bank; WHO: UNICEF	2015
7.1	**Health life expectancy**			
7.1.1	Life expectancy at birth, total (years)		World Bank	2016
7.1.2	Healthy life expectancy (HALE)		World Health Organisation, GHO database	2012
7.2	**Prevalence of over-nourishment**			
7.2.1	Prevalence of overweight in children (5-19 years of age)		World Health Organisation, GHO database	2016
7.2.2	Overweight (body mass index >= 25) (age-standardized estimate)		World Health Organisation, GHO database	2016
7.3	**Impact on health**			

7.3.1	Disability Adjusted Life Years (DALYs)		World Health Organisation	2012
7.4	**Physical activity**			
7.4.1	% of population reaching recommended physical activity per week		The Lancet Global Health	2016
7.4.2	Hours of inactivity as measured by fixed screen time per week		Millward and Brown, AdReaction 2014 report	2014
8.1	**Diet composition**			
8.1.1	% of sugar in diets		FAO	2013
8.1.2	Meat consumption levels		FAO, McMichael, AJ et al. "Food, livestock production, energy, climate change, and health"	2013
8.1.3	Saturated fat consumption		FAO	2013
8.1.4	Salt consumption		Powles, John, et al. "Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide."	2010
8.2	**Number of people per fast food restaurant**			
8.2.1	Number of people per fast food restaurant		EIU research	2017
8.3	**Economic determinant of dietary patterns**			

8.3.1	Proportion of population living below the national poverty line		SDG UNSTATS database, OECD and CIA Factbooks	2007-2015
8.3.2	GINI Coefficient		World Bank: OECD	2005-2016
8.4	**Policy response to dietary patterns**			
8.4.1	Quality of policy response to dietary patterns		EIU research	
8.4.1.1	Healthy eating policies	Are there any government-led national policies and/or programmes to promote healthy eating patterns? 0 = No 1 = Yes	EIU research	
8.4.1.2	Dietary guidelines	Are there any healthy eating guidelines at national level? 0 = No 1 = Yes 2 = Yes, and updated within the past 5 years	EIU research	
8.4.1.3	Processed food taxes	Are there any national-level taxes on processed food? 0 – 1 *Countries that have processed food taxes in place receive full credit. In cases where a country does not have taxes in place, a score from 0-.99 has been assigned based on the percentage of the adult population in the country that is overweight. In cases where a larger portion of the population is overweight, a lower figure has been applied. This decision reflects the need for a proactive response to an existing issue in countries where overweight populations is an existing issue.*	EIU research	
8.4.1.4	Input subsidies	Are there any subsidies on inputs (sugar, corn syrup or palm oil) for processed food? 0 - 1 *Countries that have no input subsidies in place receive full credit. In cases where a country does have input subsidies in place, a score from 0-.99 has been assigned based on the percentage of the adult population in the country that is overweight. In cases where a larger portion of the population is overweight, a lower figure has been*	EIU research	

		applied. This decision reflects the need for a proactive response to an existing issue in countries where overweight populations is an existing issue.		
8.4.2	Compulsory nutrition education	Are there any subsidies on inputs (sugar, corn syrup or palm oil) for processed food? 0 = No 1 = Yes	EIU research	

BG	Background indicators	Source	Year
BG01	Current health expenditure per capita (current US$)	World Bank	2015
BG02	NEF Happy Planet Index	NEF	2016
BG03	2028 Population	UN	2017
BG04	Population growth (2018-2028)	UN	2017
BG05	Growth in population as a % of global pop (2018-2028)	UN	2017
BG06	GDP	EIU	2018
BG07	GDP per head	EIU	2018
BG08	Human Development Index	UNDP	2016
BG09	Access to credit for farmers	Agriculture Orientation Index	2001-2016
BG10	Median urinary iodine concentration in children (μg/L)	Iodine Global Network	2002-2016
BG11	Proportion of population living below the national poverty line (% rural)	World Bank	2000-2016