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Pocketbook
World food
and agriculture

2015



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Foreword

This year, 2015, is a pivotal one as we look back on the progress we have made on the development agenda, and forward on what we must still accomplish.

This is the end of a 15-year cycle where the international community partnered with developing countries to tackle the Millennium Development Goals. We are now taking stock of what we can learn from that effort. For example we know that the commitment to halve the percentage of hungry people, that is, to reach the MDG 1c target, has been almost met at the global level. Indeed, 72 of the 129 countries monitored for progress have reached that MDG target, while 29 of them also reached the more ambitious WFS goal by at least halving the number of undernourished people in their populations.

This year also marks the beginning of the new post-2015 Sustainable Development Agenda. Again the international community will unite around new priorities for the future.

Clear indicators to measure progress towards these international goals is of paramount importance. Timely and robust statistics are the fundamental tool in monitoring the myriad efforts being made, both with an eye to early detection of problems and the recognition of success. The better the data, the better the policies that can be designed. And the better the data, the easier it is to measure the impact of policies or to hold stakeholders accountable for the pledges they make.

This publication presents selected key indicators related to agriculture and food security that stakeholders can use to prioritize their actions. It is divided into two main sections, one thematic and one country-specific. It presents a variety of dimensions of agriculture and food security along four main focus areas:

The setting measures the state of the agricultural resource base by assessing the supply of land, labour, capital and inputs, and examining the pressure on the world food system stemming from demographic and macroeconomic change.

Hunger dimensions gauges the state of food insecurity and malnutrition, and highlights the four dimensions – availability, access, stability and utilization – that determine the scale of hunger and the shape of undernourishment.

Food supply evaluates the past and present productive capacity of world agriculture, together with the role of trade, in meeting the world's demand for food, feed and other products.

Environment examines the sustainability of agriculture in the context of the pressure it exerts on its ecological surroundings, including the interaction of agriculture with climate change.

This Pocketbook is part of the FAO Statistical Yearbook suite of products and is just one of the tools that can be used as building blocks for monitoring progress and formulating policy. It includes data from FAOSTAT as well as from other partners within the organization and in the international community.

FAO is deeply committed to helping countries strengthen their statistical systems to improve the timeliness and quality of their data. And it will continue to do so through the SDG process.

Pietro Gennari

Chief Statistician and Director, Statistics Division

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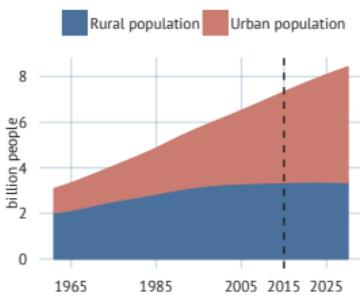
Definitions

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Overview

A combination of declining mortality rates, prolonged life expectancy and younger populations in regions with high fertility contributes to population growth in the world. While growth rates have been slowing since the late 1960s, the world's population has nevertheless doubled since then, to over 7 billion people. Population growth is generally highest where income levels are low. This is especially true in cities. Since 2008, there have been more people living in cities than in rural areas.

CHART 1: World rural and urban population (1961 to 2030)



Data after 2010 are projections.

CHART 2: Population, average annual growth (2004-2014)



CHART 3: Life expectancy at birth, countries with the highest and lowest values (2013)

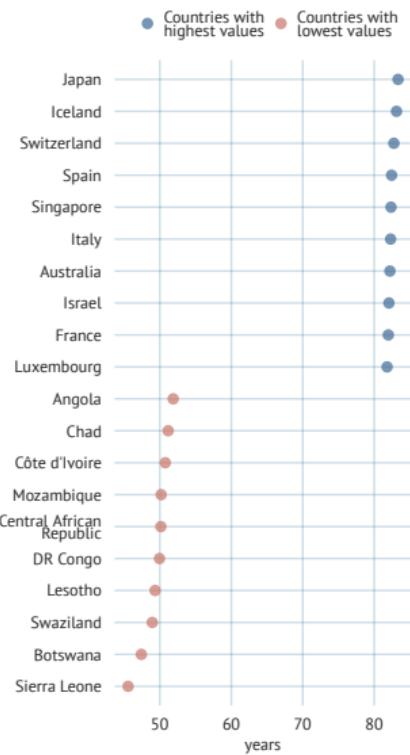


CHART 4: Total economically active population in Asia (2000 to 2014)

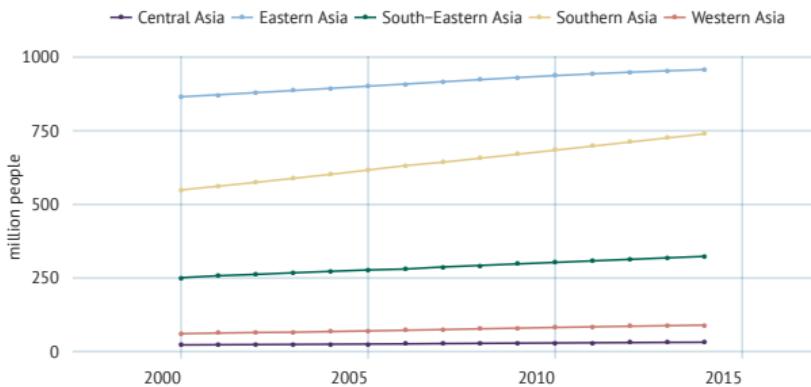
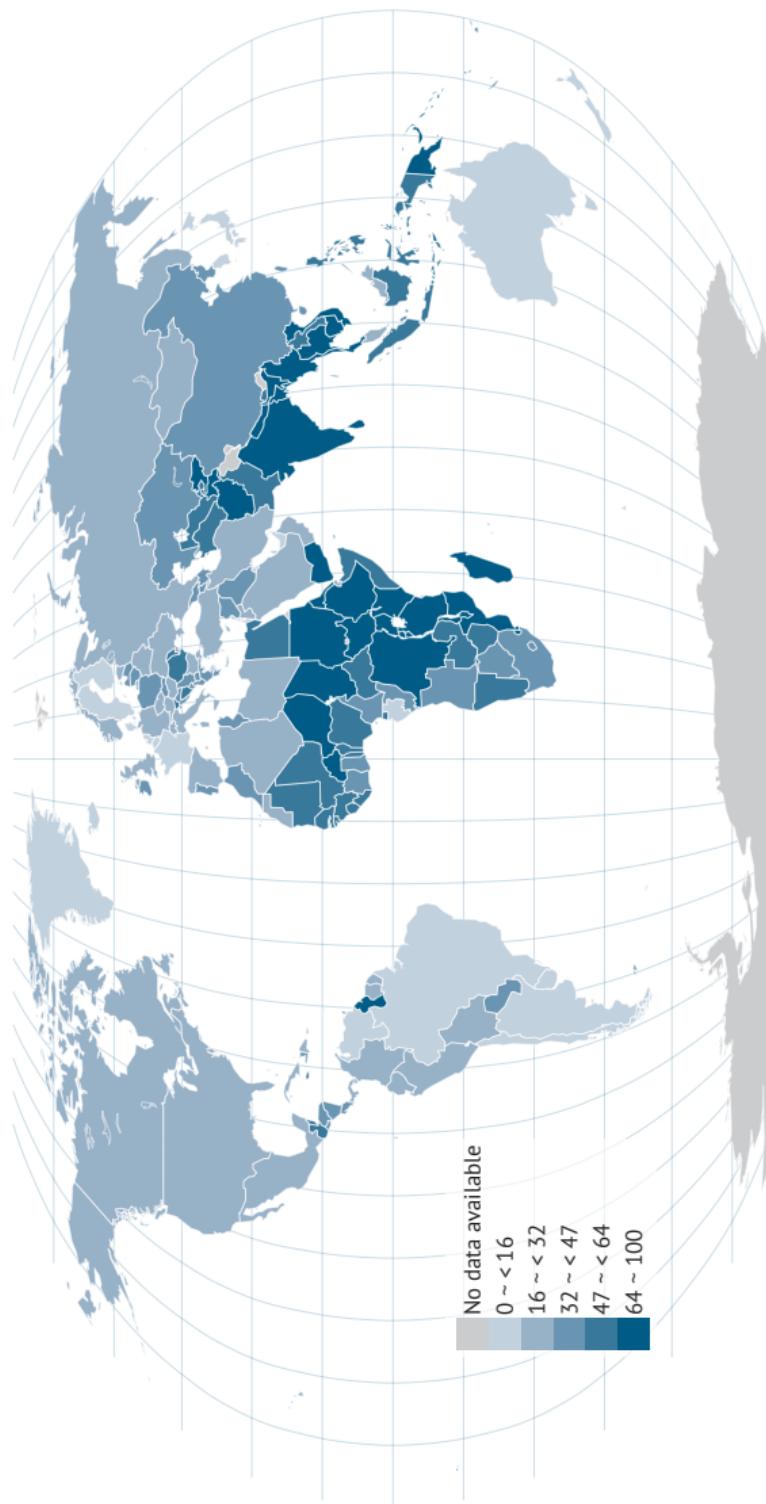


FIGURE 1: Rural population, share of total population (percent, 2014)



Economy

While some sectors have been hard hit, agriculture has demonstrated resilience during the recent economic downturn. Changes in the wider economy, including growing global integration, affect the performance of the agriculture sector. Higher overall economic growth also raises consumers' incomes and hence food demand. Changing interest rates influence capital investments, land values and storage levels, while inflation affects input prices, revenues and credit costs. Fluctuations in exchange rates have an important bearing on international competitiveness and trade flows.

CHART 5: Value added in agriculture, industry and services, share of GDP (2013)

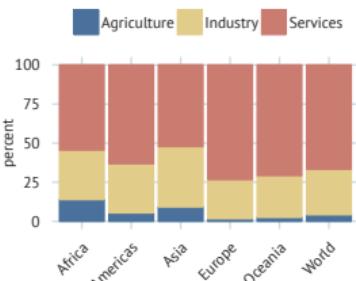


CHART 6: Agriculture value added per worker, countries with the highest values (2013)



CHART 7: Value added in agriculture, average annual growth (2003-2013)

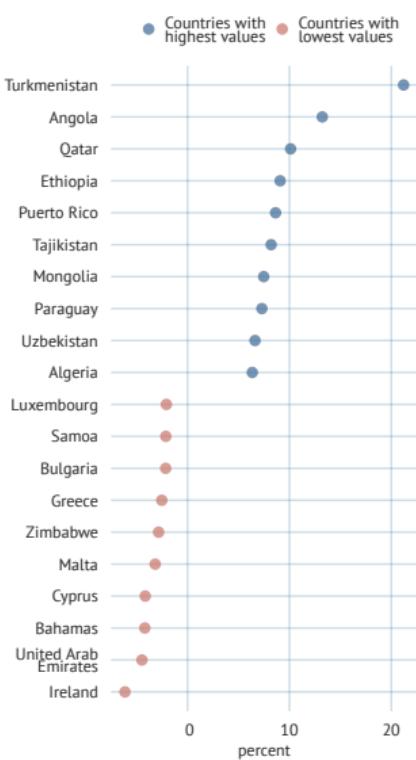


CHART 8: Value added in agriculture as share of GDP

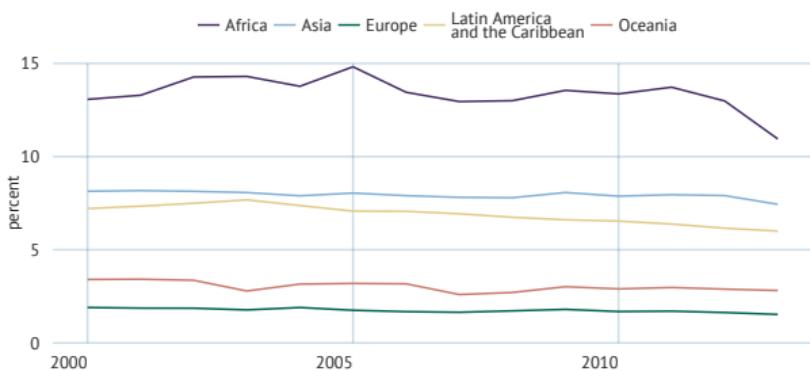
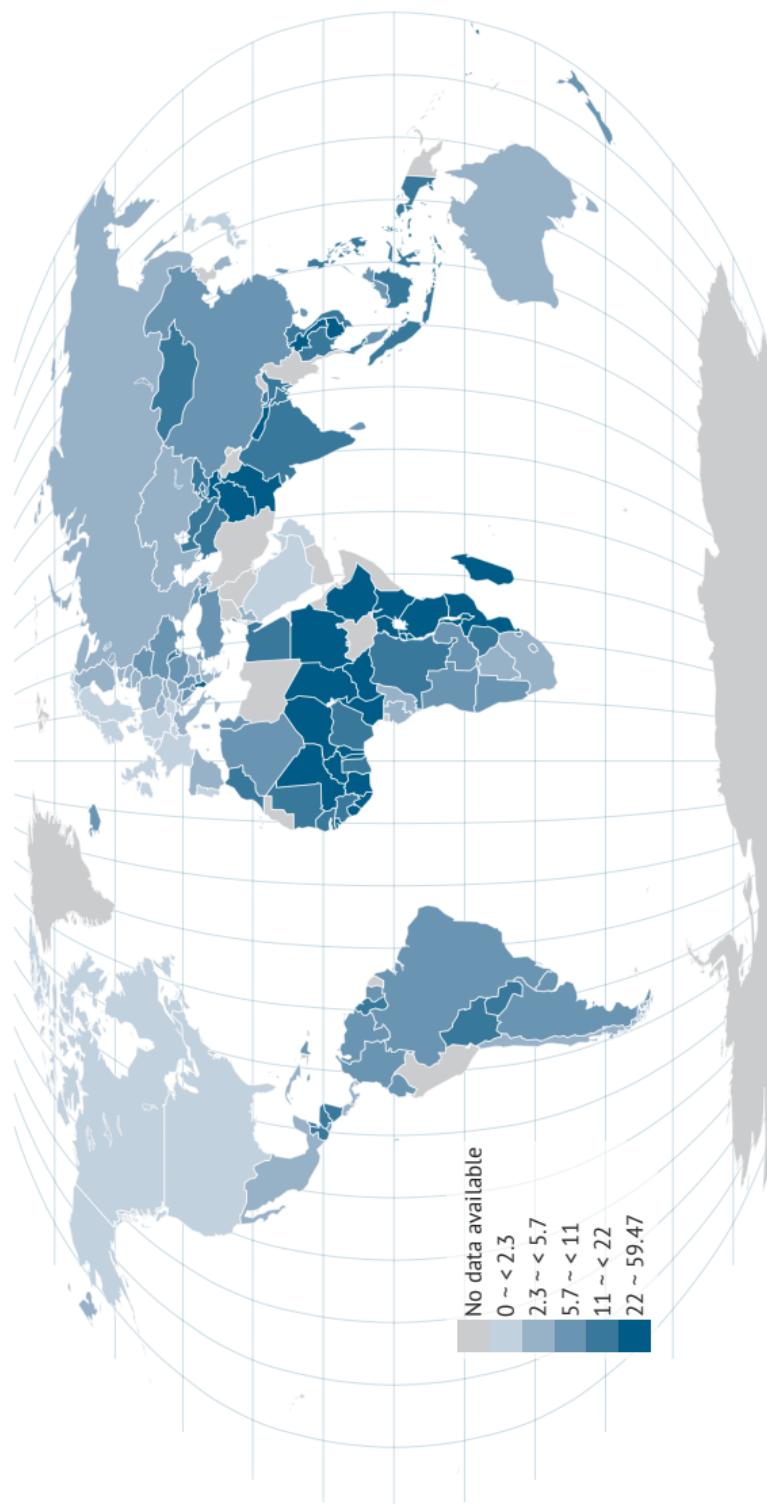


FIGURE 2: Value added in agriculture, share of GDP (percent, 2010 to 2013*)



Labour

A strong labour market is the foundation of sustained well-being and economic growth, inclusion and social cohesion. Therefore access to safe, productive and remunerated work is essential. Yet many workers, especially the most vulnerable, do not enter into formal wage employment but are instead self-employed or participate in unpaid family work, such as in agriculture. This is especially the case with subsistence farming. As a large share of the working poor are involved in agriculture, developments in this sector have a major impact on welfare.

CHART 9: Labour force participation rate by gender, ages 15+ (2013)

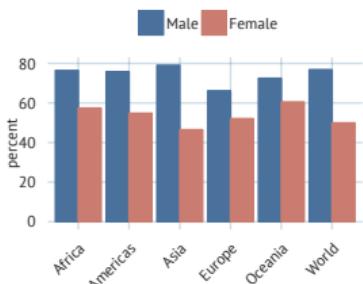


CHART 10: Female employment in agriculture, share of female employment (percent, 2012)



CHART 11: Male employment in agriculture, share of male employment (percent, 2012)



CHART 12: Female employment in agriculture, share of female employment (2000-2014)

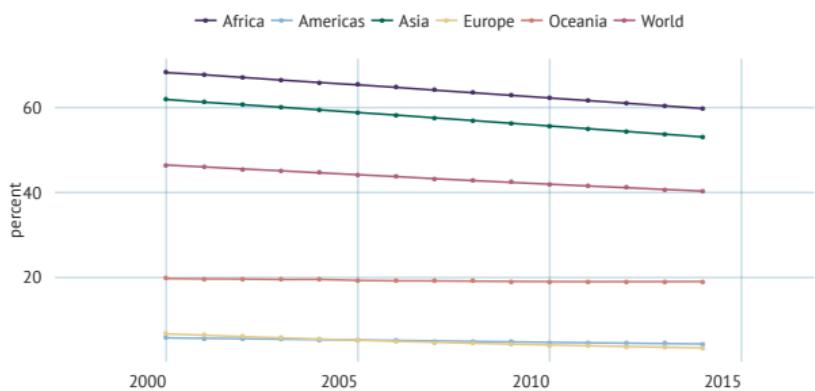
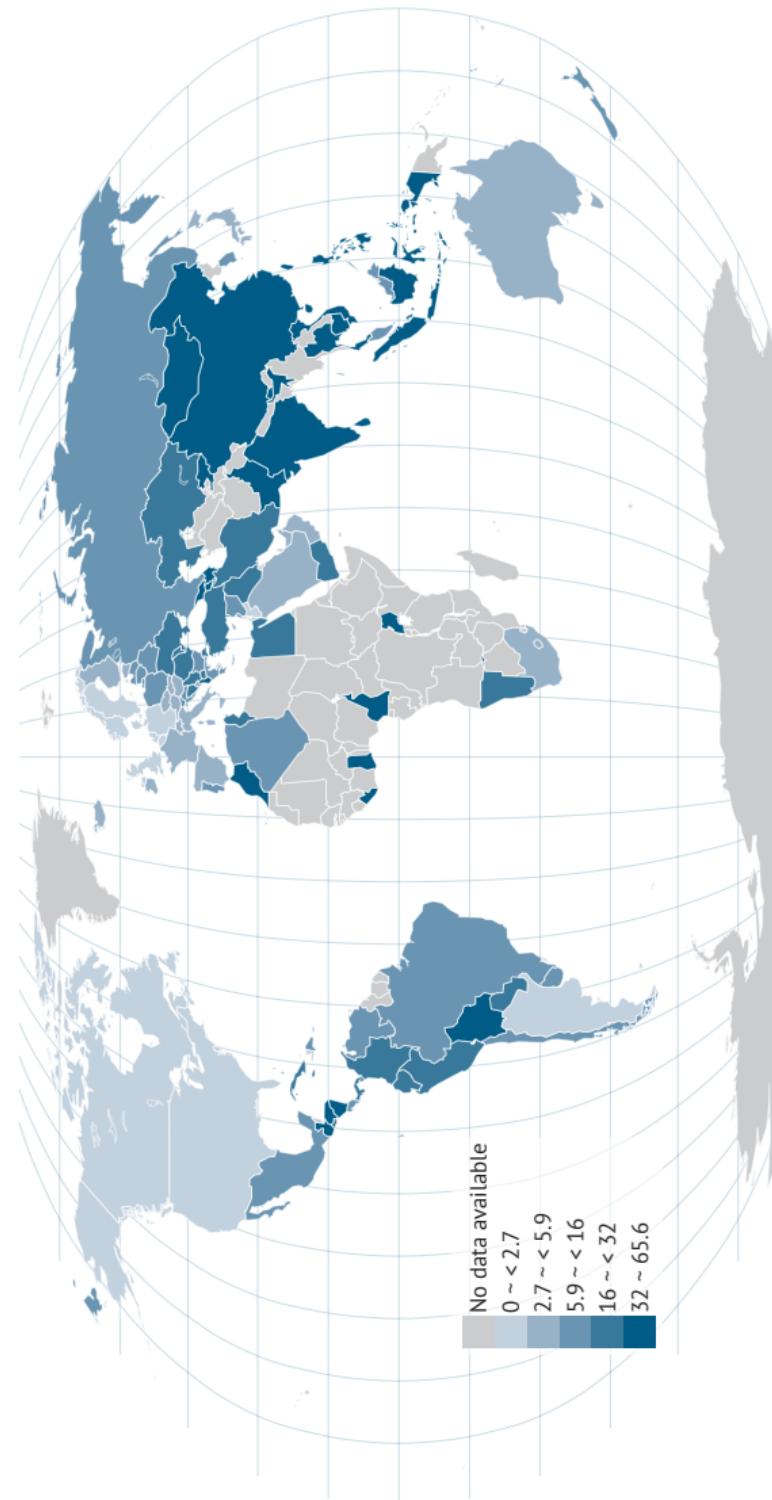


FIGURE 3: Employment in agriculture, share of total employment (percent, 2007 to 2012*)



Inputs

Adequate access to inputs, including land, pesticides and fertilizers, is vital for agricultural production and growth. Throughout Asia and in parts of Latin America, expanding seed and fertilizer use has been accompanied by investments in irrigation, rural roads, marketing infrastructure and financial services, paving the way for dynamic commercial input markets. In other regions, such as sub-Saharan Africa, the uptake of agricultural inputs is relatively low because it is often cheaper to expand cropland to have higher production.

CHART 13: Fertilizer consumption in nutrients per ha of arable land (2002 to 2012)

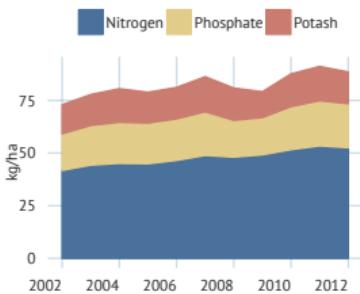


CHART 14: Nitrogen fertilizers consumption in nutrients per ha of arable land (2012)

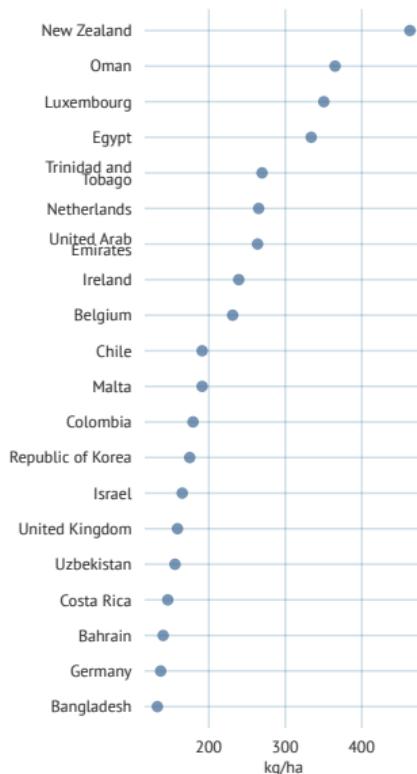


CHART 15: Phosphate fertilizers consumption in nutrients per ha of arable land (2012)



CHART 16: Fertilizer consumption in nutrients per ha of arable land (2012)

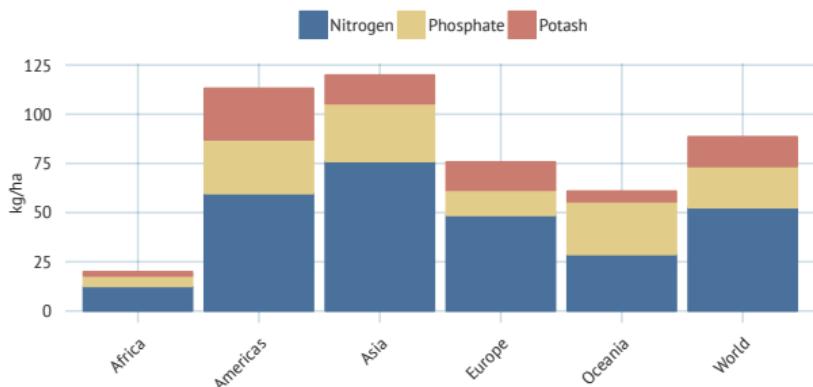
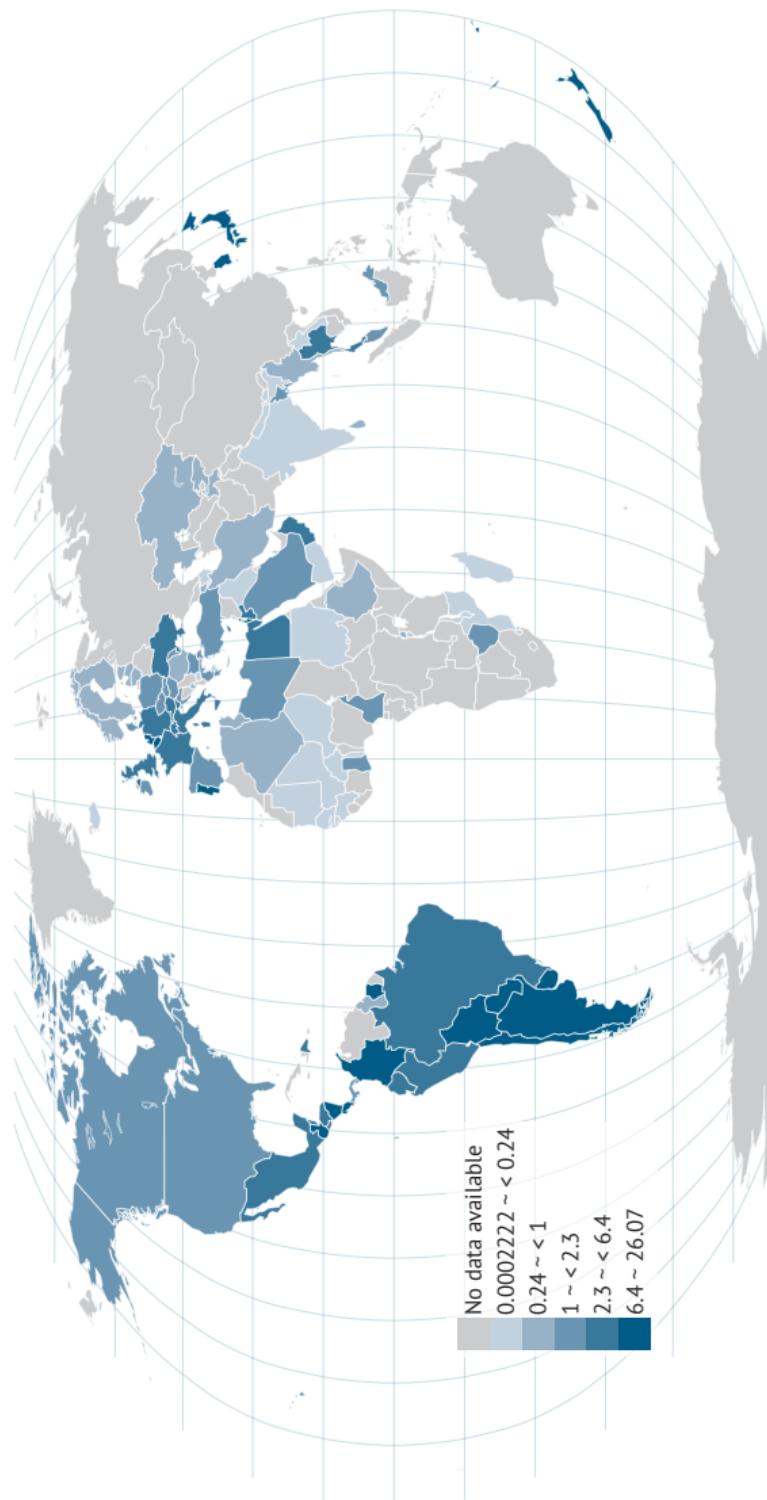


FIGURE 4: Pesticides per ha of arable land (kg/ha, 2007 to 2012*)



Investment

Investing in agriculture is one of the most effective strategies for reducing poverty and hunger, and promoting sustainability. The regions of the world where hunger and extreme poverty are most widespread today – South Asia and sub-Saharan Africa – have seen flat or declining rates of investment per worker in agriculture over the past thirty years. Farmers tend to be the largest investors in developing country agriculture, and therefore their investment decisions are paramount for any strategy aimed at improving agricultural investment.

CHART 17: Aid flows to agriculture, share of total aid (1995-2013)

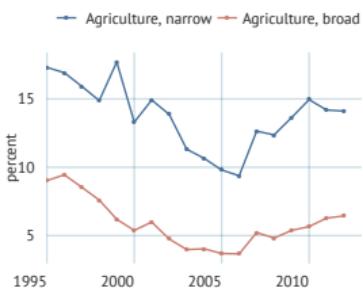


CHART 18: Total credit to agriculture, top 20 countries in 2014 (2000 and 2012)



CHART 19: Agri-Orientation Index, highest and lowest values (average 2008-2012)

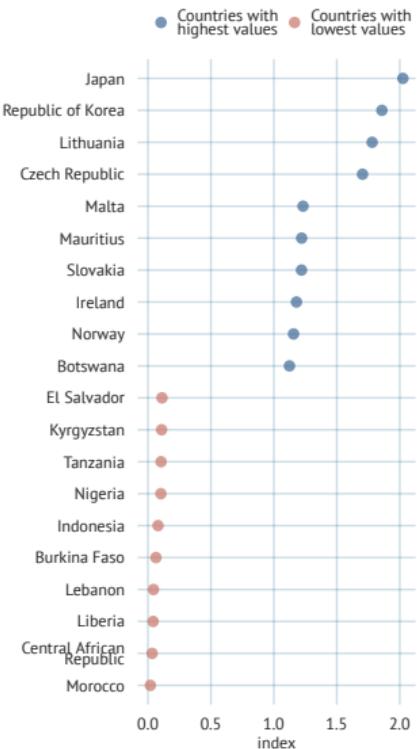


CHART 20: Aid flows to agriculture, broad (1995-2013)

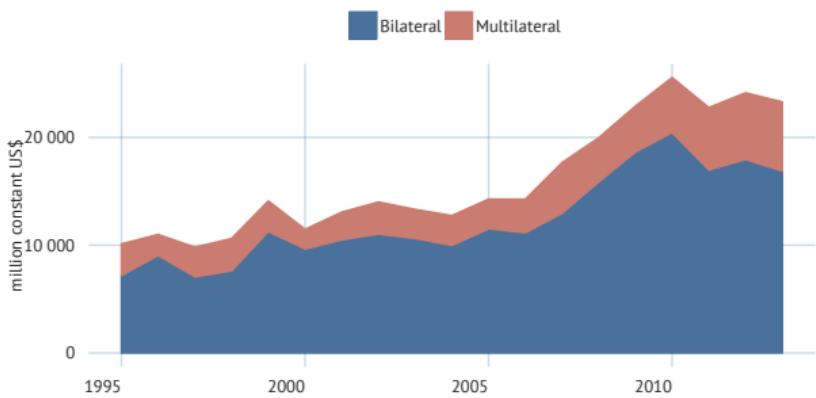
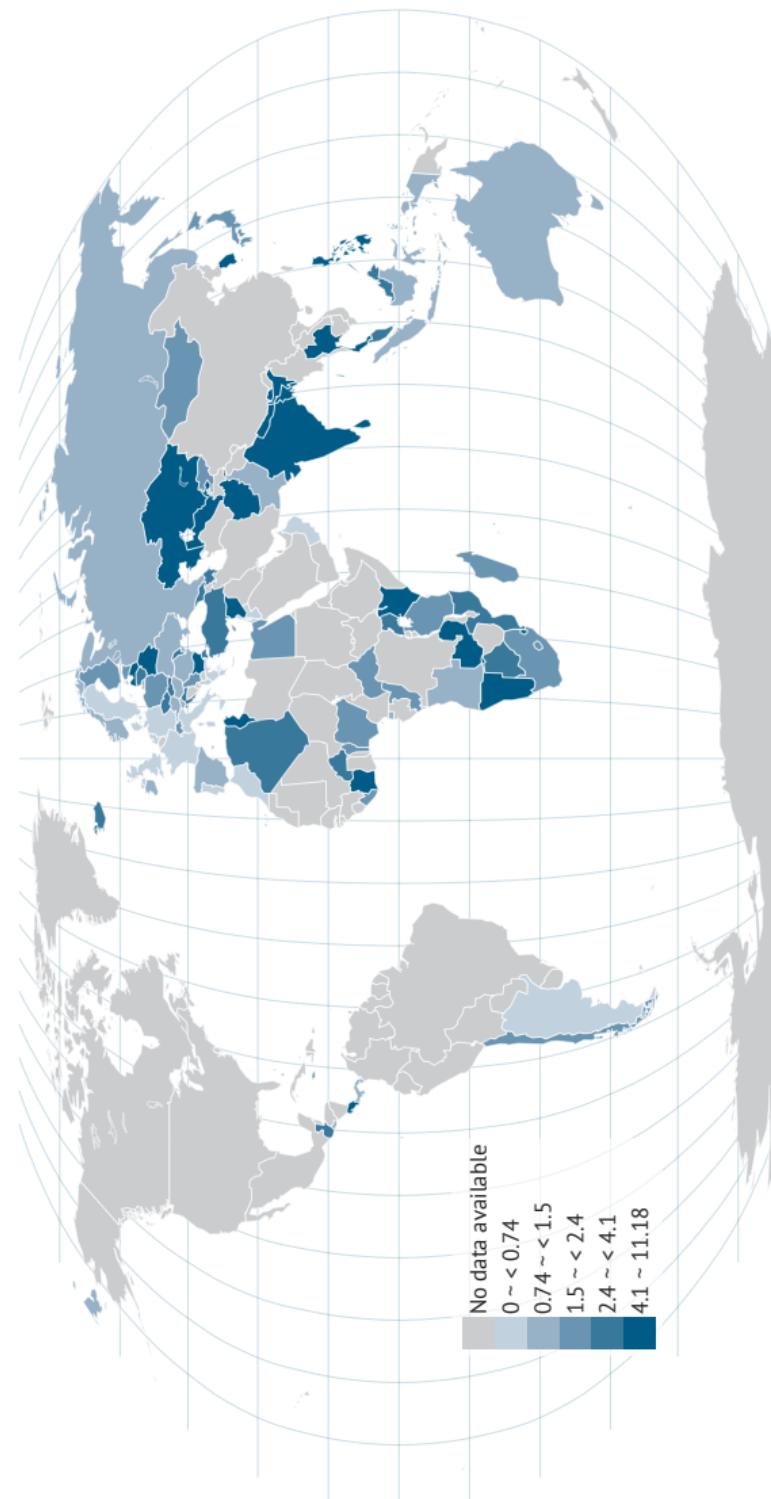


FIGURE 5: Share of government expenditure on agriculture, share of total outlays (percent, 2008 to 2012*)



Undernourishment

Undernourishment is a state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements. About 795 million people – just over one in every nine people – in the world still lack sufficient food for conducting an active and healthy life. Yet progress has been made, even in the presence of significant population growth. Two hundred and sixteen million fewer people suffer from undernourishment than 25 years ago and 167 million fewer than a decade ago.

TABLE 1: Prevalence of undernourishment (percent)

| | 1990-92 | 2014-16 |
|---------------------------------|---------|---------|
| World | 18.6 | 10.9 |
| Developed countries | <5.0 | <5.0 |
| Developing countries | 23.3 | 12.9 |
| Africa | 27.6 | 20.0 |
| Asia | 23.6 | 12.1 |
| Latin America and the Caribbean | 14.7 | 5.5 |
| Oceania | 15.7 | 14.2 |

CHART 21: Asian countries with the highest number of undernourished in 2014-16



CHART 22: African countries with the highest number of undernourished in 2014-16

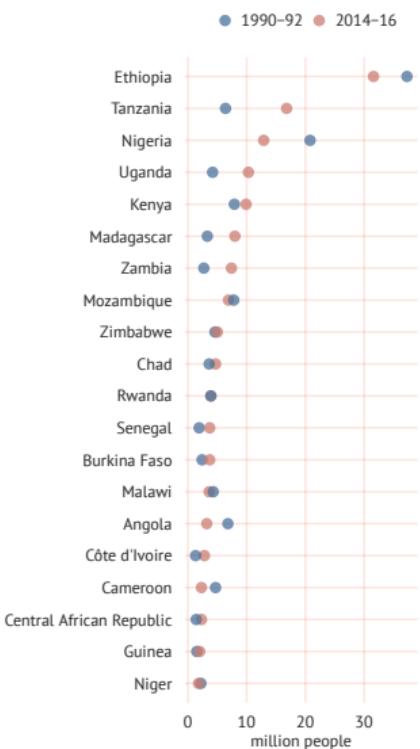


CHART 23: Number of people undernourished

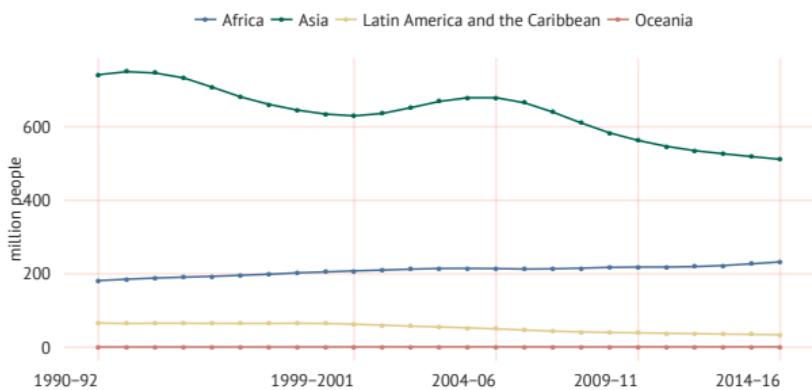
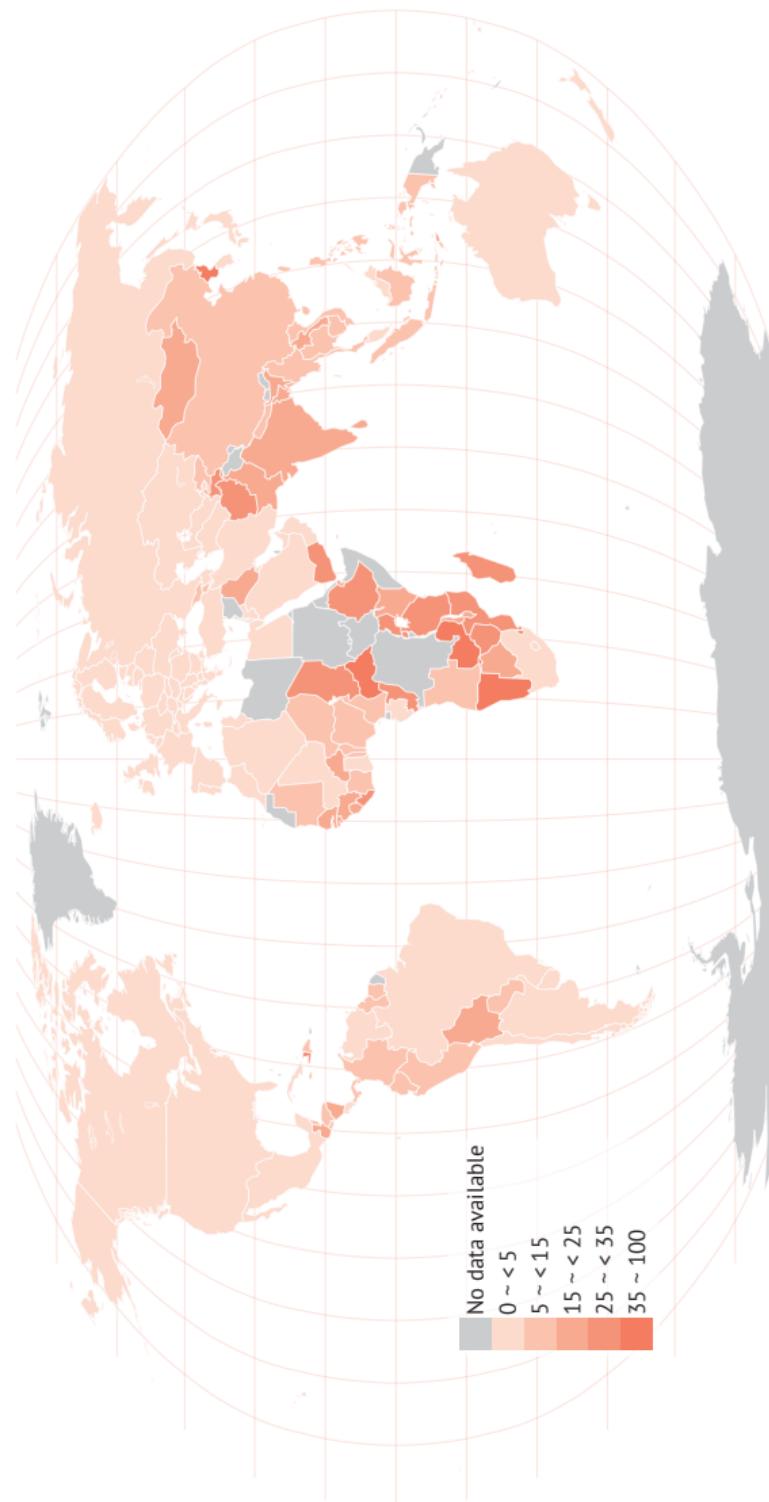


FIGURE 6: Prevalence of undernourishment (percent, 2014-16)



Food Availability

Availability is an important dimension of food security. Supplying enough food to the reference population is a necessary, but insufficient, condition for ensuring adequate access for individuals. Over recent decades, trends in food production per capita have been generally positive across most regions. However, growth rates in Africa have been lower for the last 20 years, despite notable exceptions. In most countries and regions, high food availability is associated with relatively low prevalence of undernourishment. However, outcome indicators show that high food availability does not always guarantee high food security.

CHART 25: Energy supply derived from cereals, roots and tubers, top 20 countries in 2009-2011

● 1999–2001 ● 2009–2011

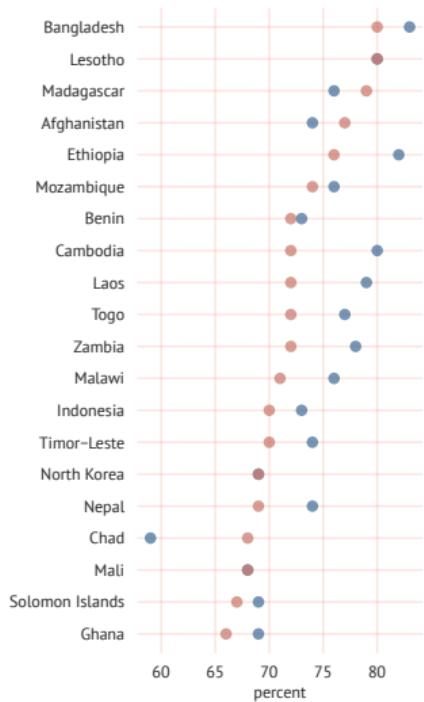


CHART 24: Average dietary energy supply adequacy, 3 year averages (1990 to 2015)

— Africa — Oceania
— Asia — World
— Latin Am. and the Carib.

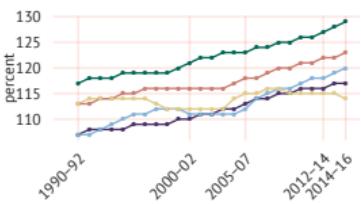


CHART 26: Average protein supply, top 20 countries in 2009–2011

● 1999–2001 ● 2009–2011

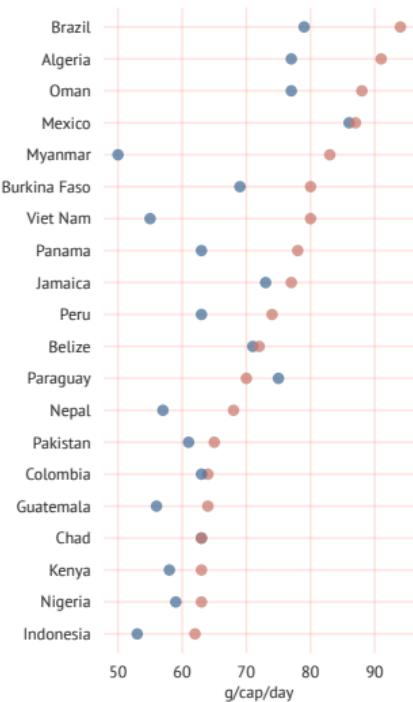


CHART 27: Average supply of protein of animal origin

— Africa — Oceania — Latin Am. and the Carib. — Asia — World

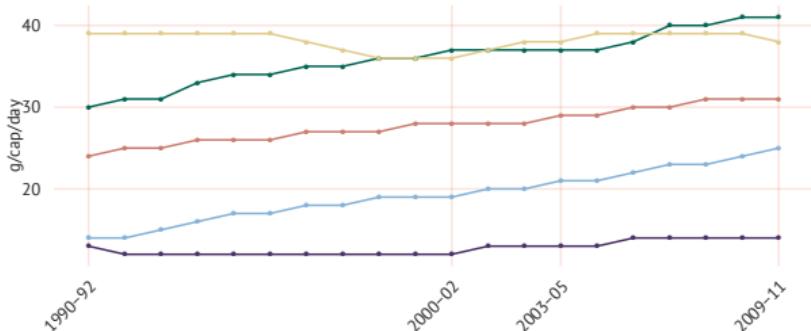
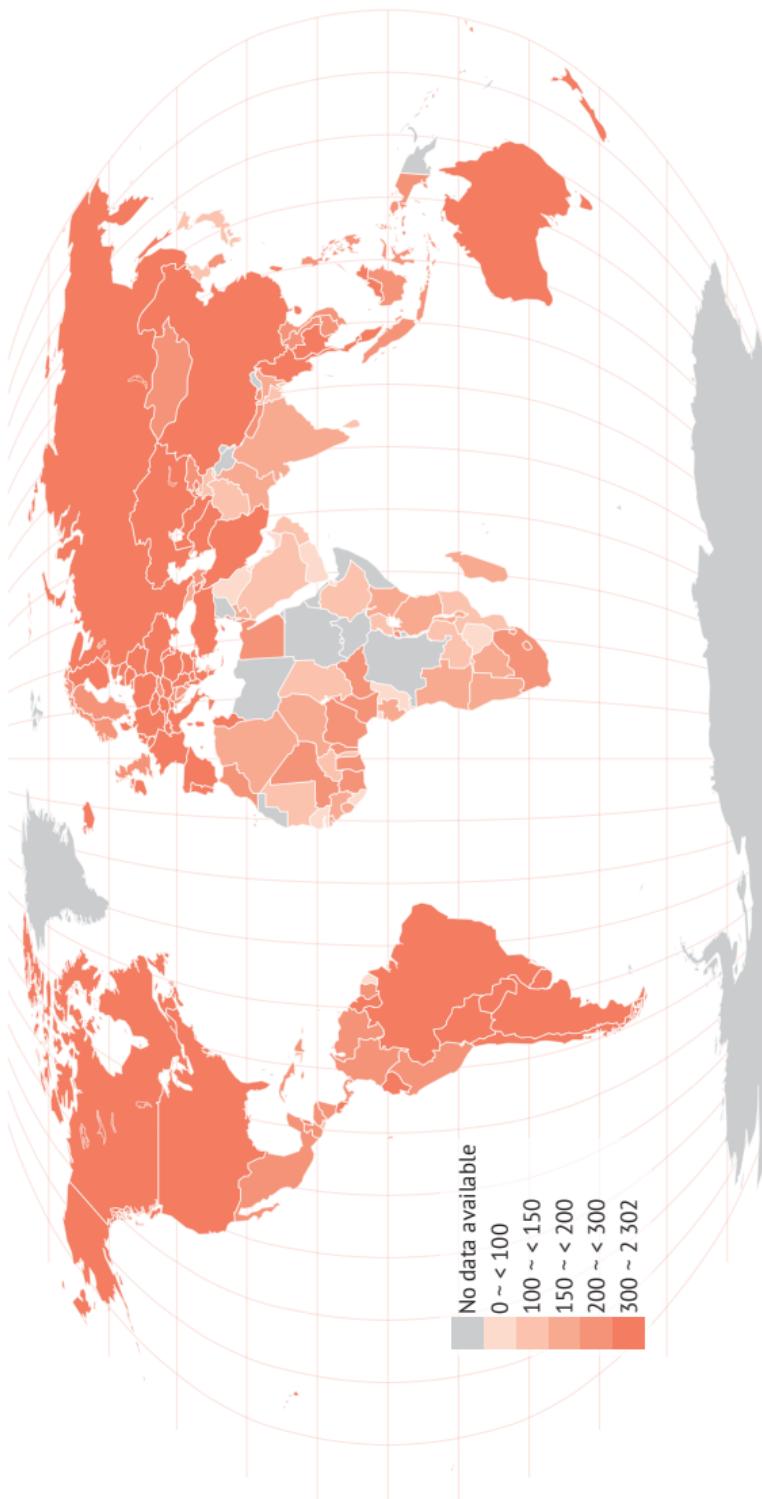


FIGURE 7: Average value of food production, constant 2004-2006 I\$ per person (3 year average, 2011-13)



Access

An adequate supply of food does not in itself guarantee household level food security. Access to food is primarily determined by incomes, food prices and the ability of households and individuals to obtain access to social support. Individuals' access to food is also heavily influenced by social variables, including gender positioning and power hierarchies within households. In addition to economic affordability, physical access to food is also facilitated by adequate infrastructure, such as railway lines and paved roads.

CHART 28: Depth of food deficit, kcal/capita/day (3 year averages)

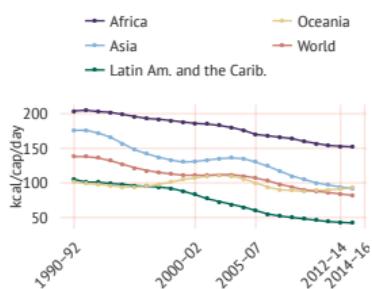


CHART 29: Domestic food price level index, top 20 countries in 2014 (2000 to 2014*)

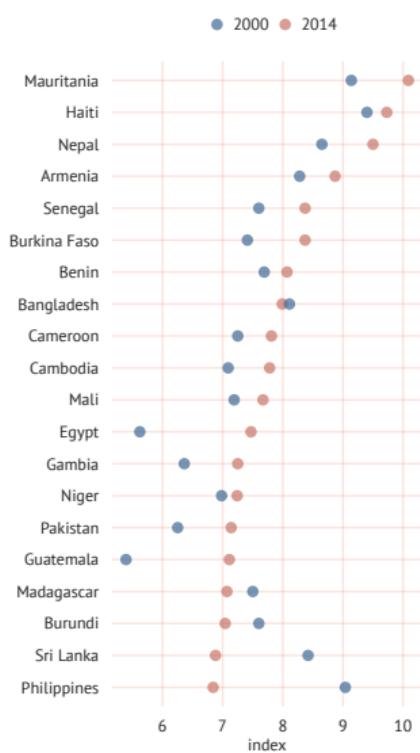


CHART 30: Prevalence of undernourishment, highest 20 countries in 2014-16 (3 year averages)

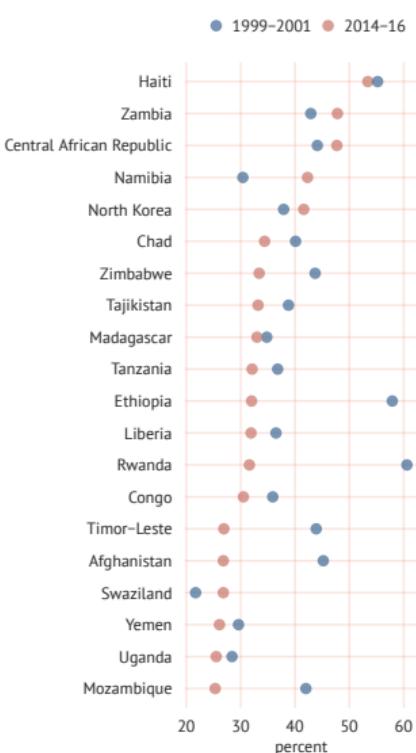


CHART 31: GDP per capita, PPP, constant 2011 international \$

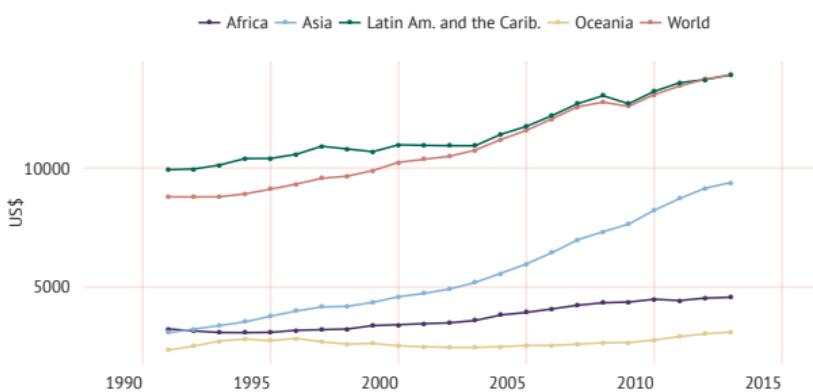
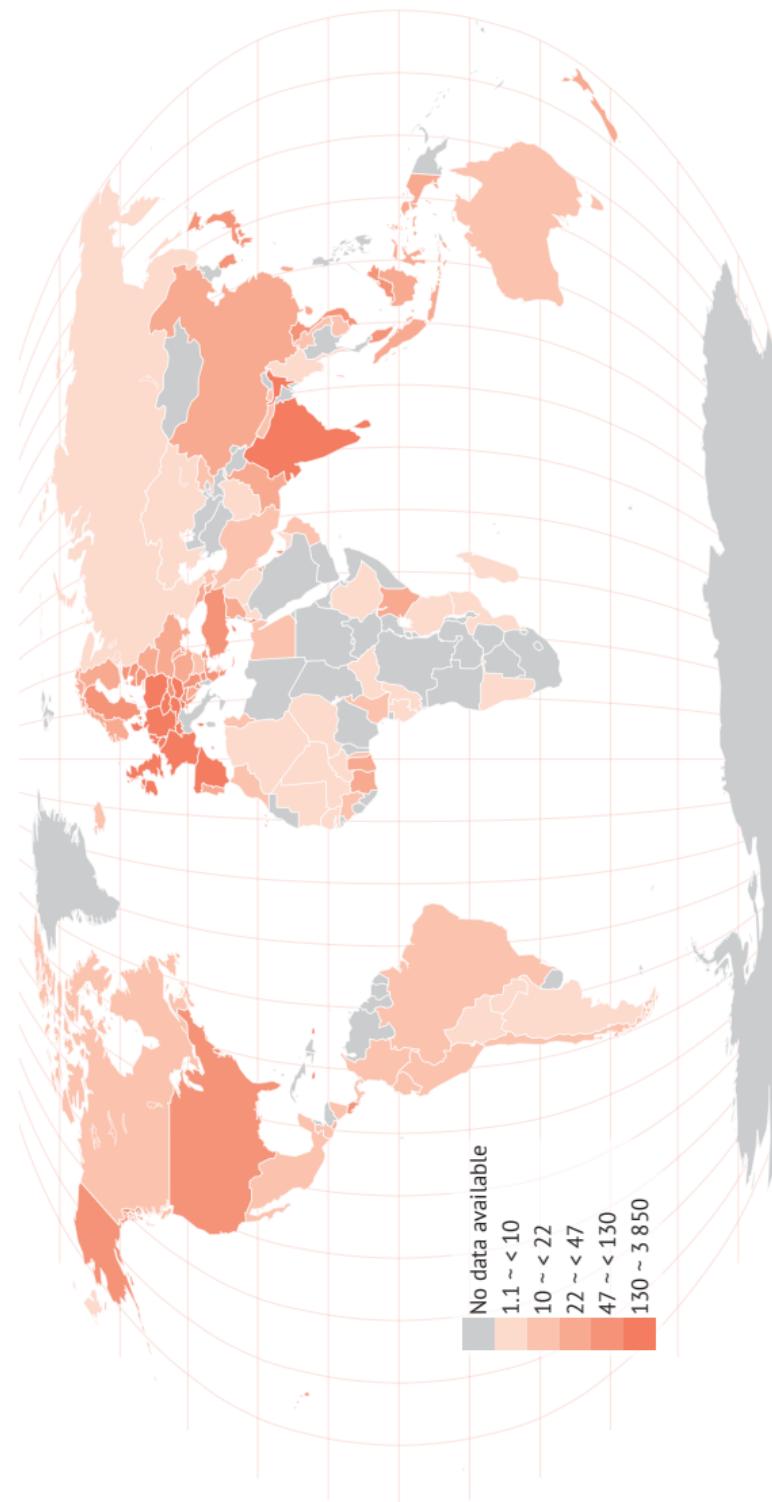


FIGURE 8: Road density, per 100 square km of land area (2007 to 2011*)



Stability

Over the last ten years, food and agricultural markets have entered an unexpectedly turbulent phase, characterized by large supply shortfalls, price swings. Political and economic uncertainties, coupled with extreme weather conditions, can have direct and adverse impacts on food security. The poorer the household, the stronger the impact of external shocks, as poor households spend a proportionally higher share of their incomes on food.

CHART 32: Per capita food production variability, constant 2004-2006 thousand international \$

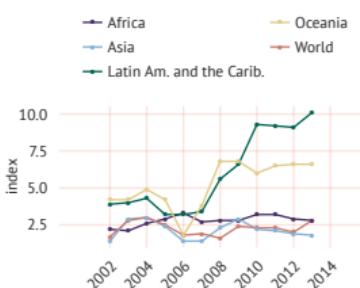


CHART 33: Per capita food supply variability, top 20 countries in 2011, kcal/capita/day

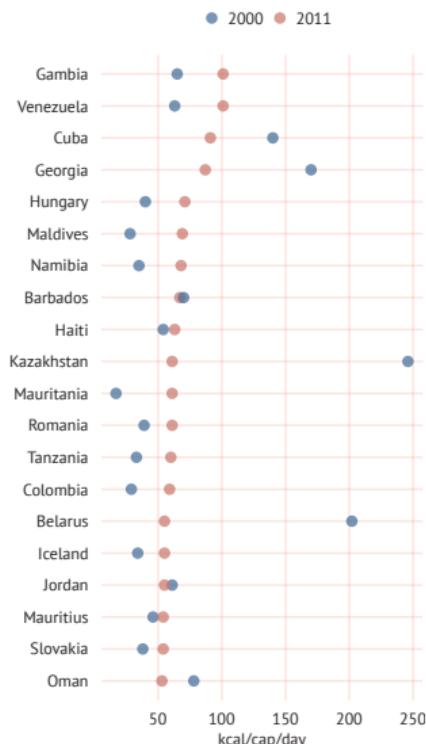


CHART 34: Domestic food price volatility index, top 20 countries in 2014

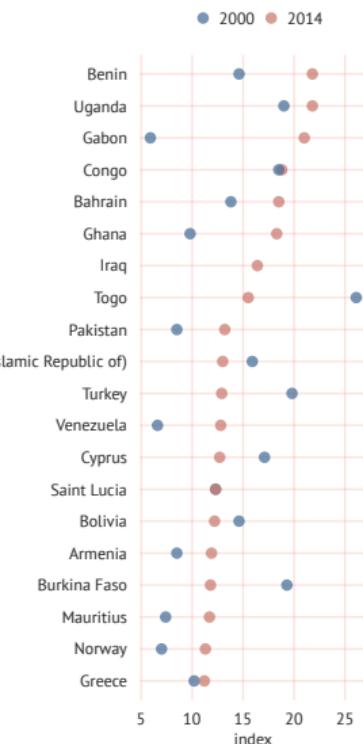


CHART 35: Value of food imports as a share of total merchandise exports (3 year averages)

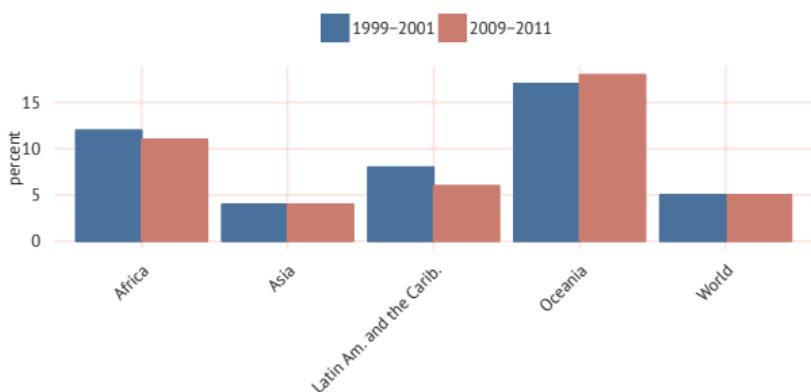
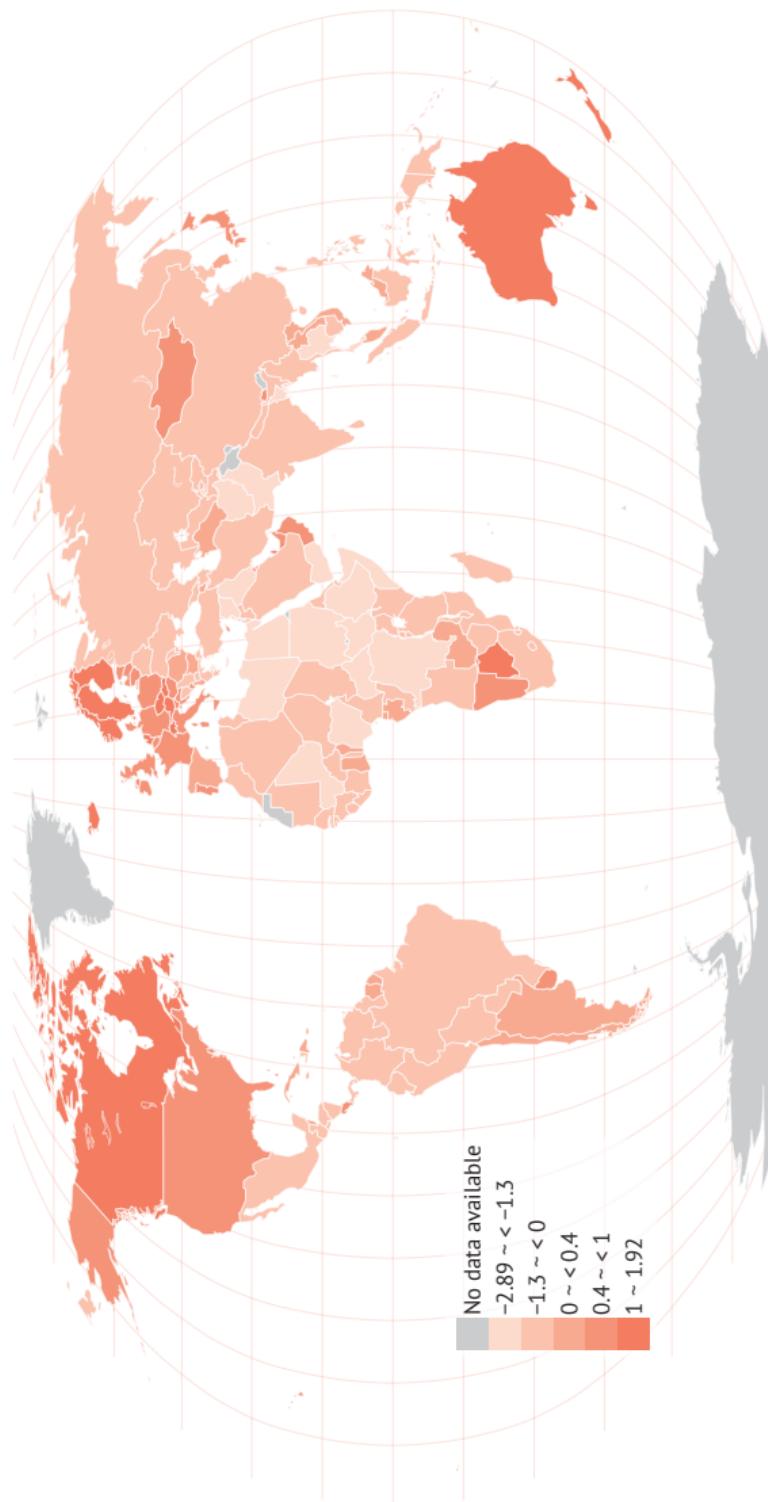


FIGURE 9: Political stability and absence of violence/terrorism, index (2013)



Utilization

Utilization emphasizes the nutritional aspects of food security. It is commonly understood as the way the body makes the most of nutrients from food. Sufficient energy and nutrient intake includes nutritious and safe diets, a clean environment, access to health care, diversity of a diet and intra-household distribution of food. Poor utilization within a population can impose economic and social costs in countries at all economic levels.

TABLE 2: Countries with highest share of children under 5 who are underweight, percent

| | Year | % |
|-------------|------|------|
| Timor-Leste | 2009 | 45.3 |
| Eritrea | 2010 | 38.8 |
| Niger | 2012 | 37.9 |
| Yemen | 2011 | 35.5 |
| Bangladesh | 2013 | 31.9 |

CHART 36: Percentage of children under 5 who are stunted, highest 20 countries (2006 - 2014*)

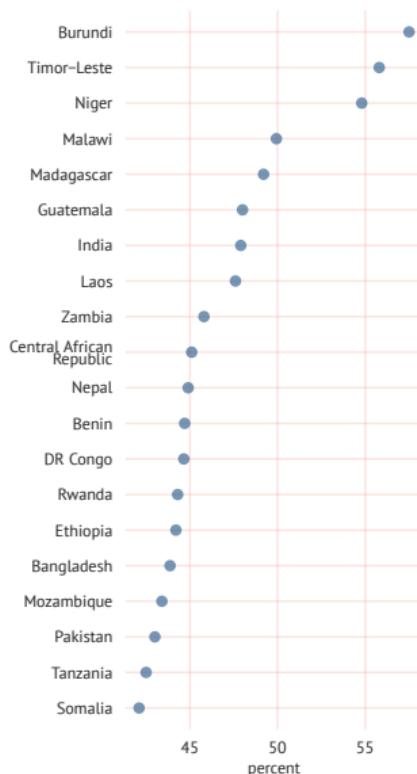


CHART 37: Percentage of children under 5 affected by wasting, highest 20 countries (2006 - 2014*)

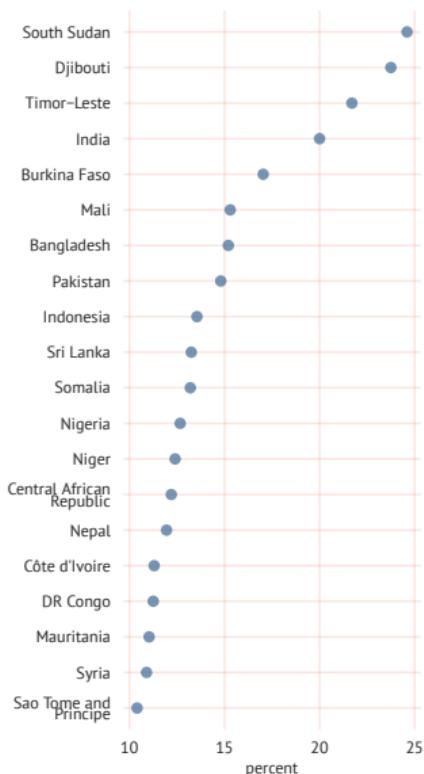


CHART 38: Access to improved water source and sanitation facilities

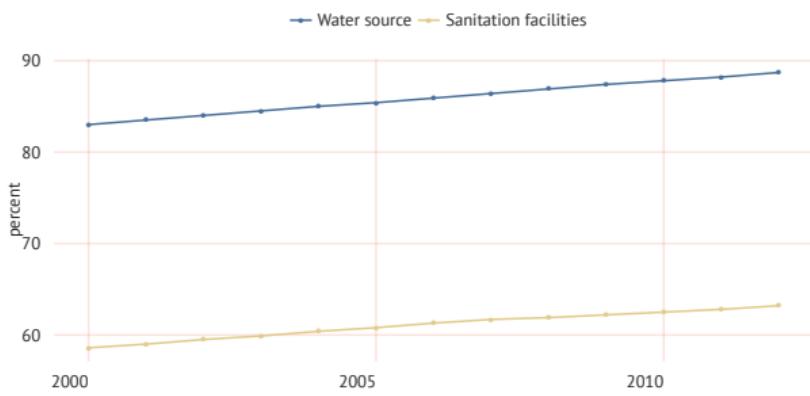
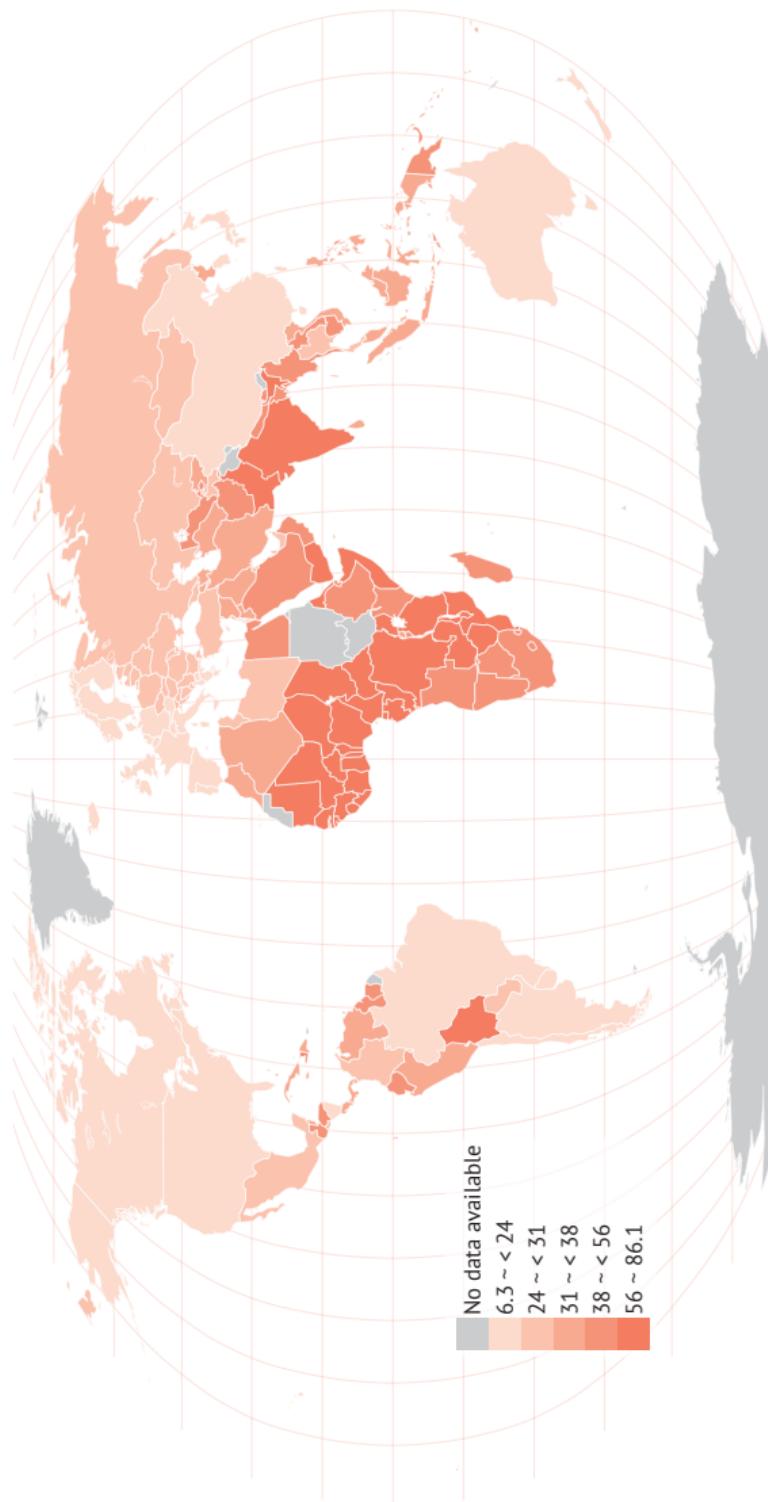


FIGURE 10: Percentage of anaemia among children under 5, percent (2011)



Dietary energy supply

The dietary energy supply (DES) is the food available for human consumption, expressed in kilocalories per person per day. At the country level, it is calculated as a measure of food available for human use after taking out all non-food utilization, including exports, industrial use, animal feed, seed, wastage and changes in stocks. In 1961 the average global calorie availability was as low as 2 196 kcal/cap/day; by 2011, it had reached 2 870 kcal/cap/day, and was centered more around a narrow base of staple grains as well as meat and dairy products.

CHART 39: Share of dietary energy supply, kcal/capita/day (2009-2011)

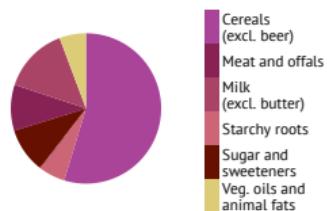


CHART 40: Dietary energy supply, top 20 countries in 2015

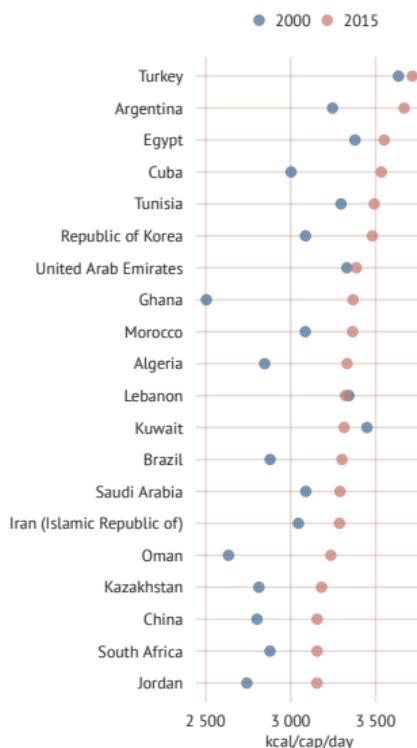


CHART 41: Dietary energy supply, bottom 20 countries in 2015

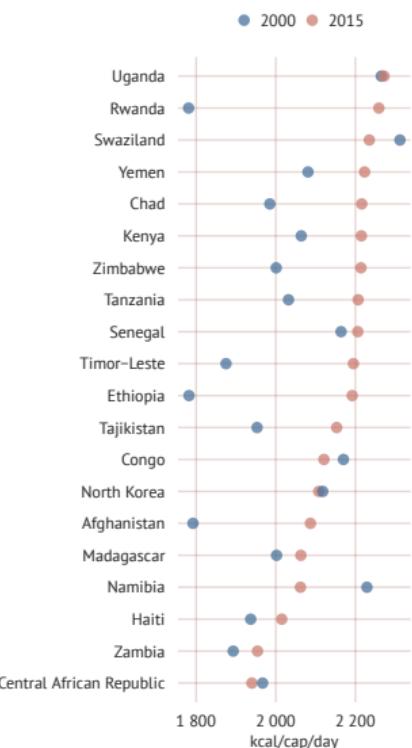


CHART 42: Dietary energy supply, kcal/cap/day

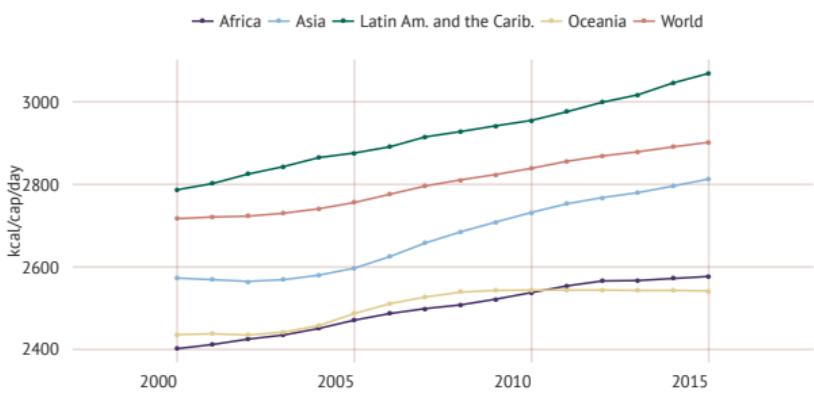
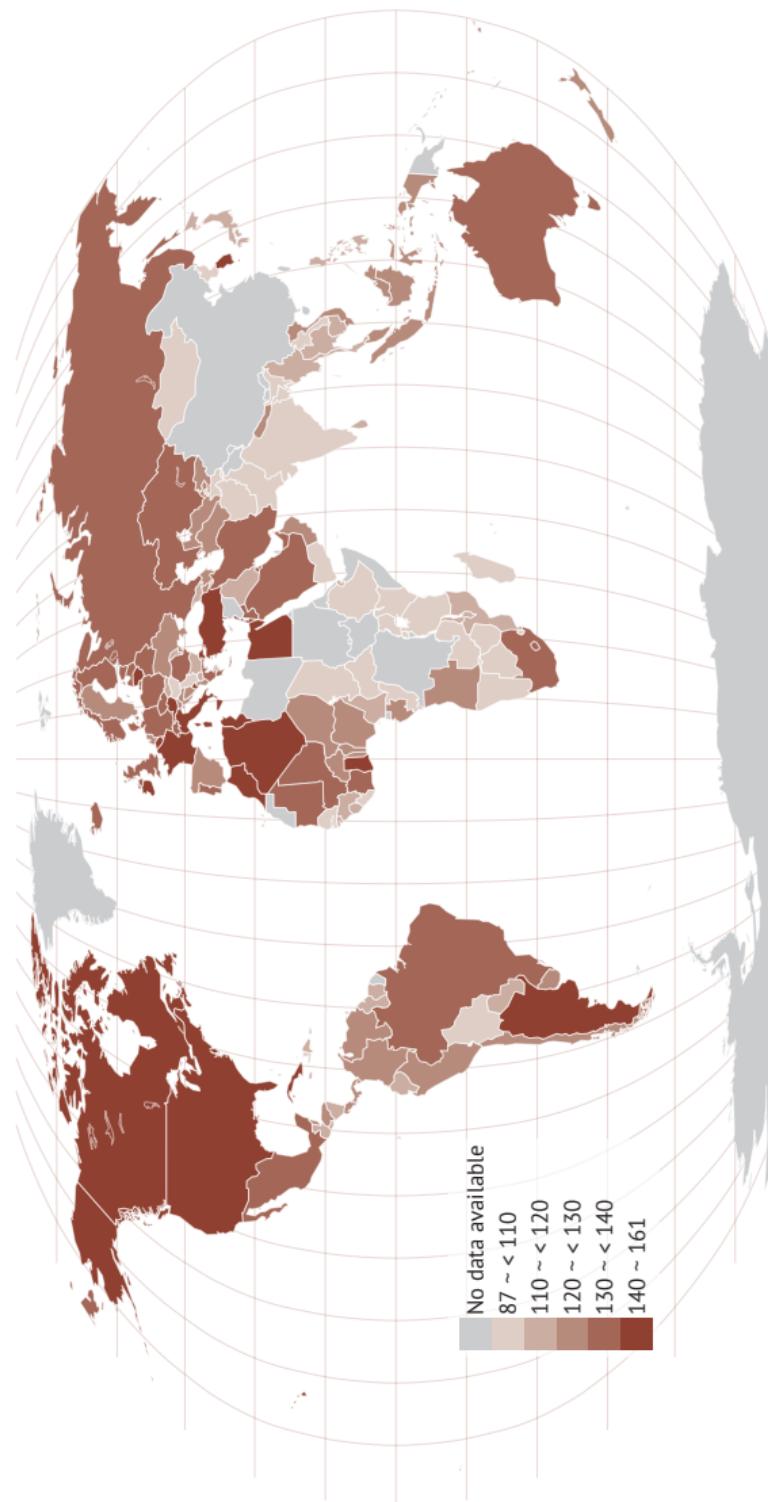


FIGURE 11: Average dietary energy supply adequacy, percent (2014–2016)



Growth in crop production

The majority of people in developing countries live in rural areas, and most of them depend on agriculture for their livelihoods. Over the past 50 years, growth in crop production has been driven largely by higher yields per unit of land, and crop intensification. Trends are not uniform across regions, however. Most of the growth in wheat and rice production in Asia and Northern Africa has been from gains in yield, while expansion of harvested land has led to production growth of maize in Latin America and in sub-Saharan Africa.

TABLE 3: Fastest growing products based on quantities (average annual growth rate, 2000 to 2013)

| | % |
|---------------|----|
| Jojoba seed | 19 |
| Peppermint | 14 |
| Bambara beans | 12 |
| Poppy seed | 9 |
| Pistachios | 9 |

CHART 43: Top 20 crop producing countries in 2012 based on net per capita crop production value

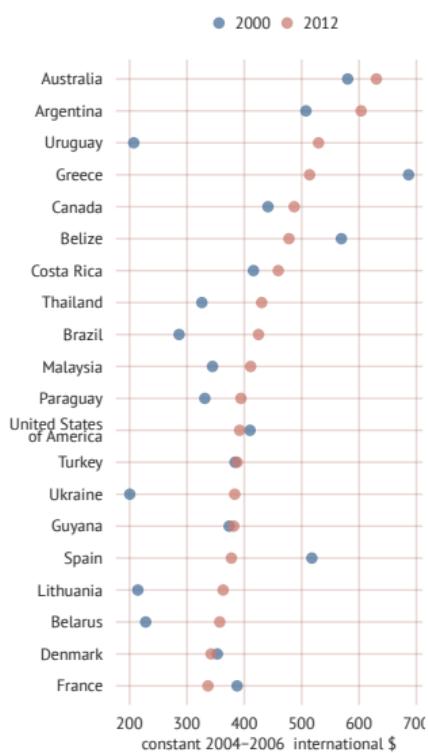


CHART 44: Top 20 food producing countries in 2012 based on net food per capita production value

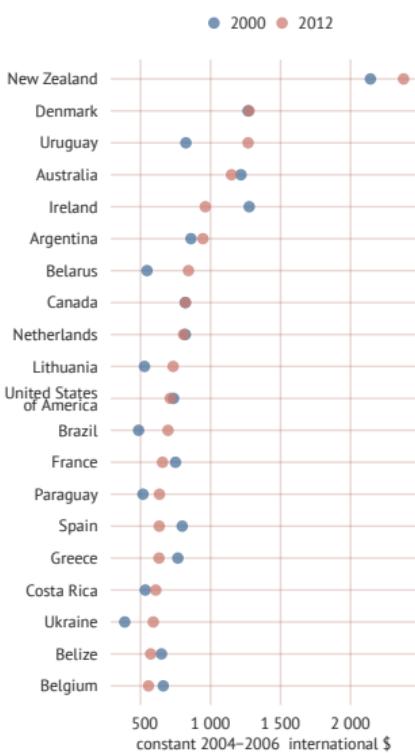


CHART 45: Average annual growth in cereals production (2000-13)

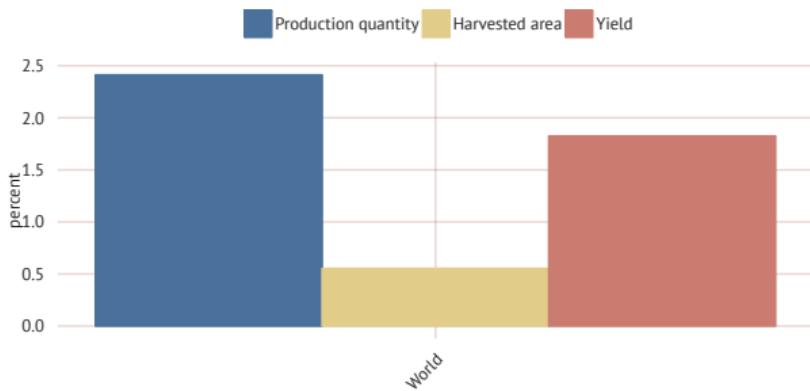
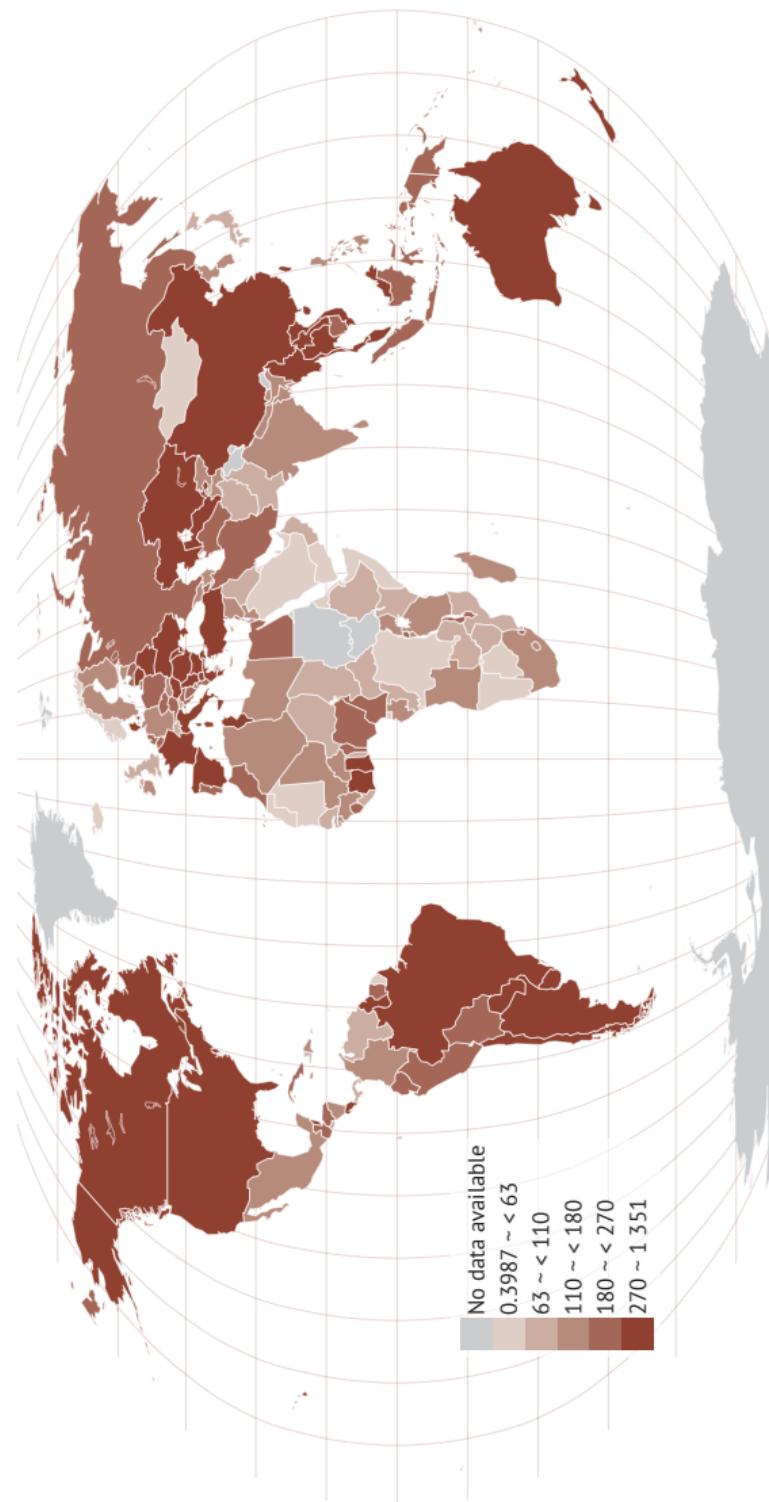


FIGURE 12: Crops, gross per capita production index (2004-06 = 100, 2013)



Crop sector

Cereals, which include wheat, rice, barley, maize, rye, oats and millet, make up the majority of the production of the crop sector. They continue to be the most important food source for human consumption. Yet external factors, such as rising incomes and urbanization, are causing diets to shift towards diets that are higher in protein, fats and sugar. In addition, livestock and biofuel production have and will most likely grow at a faster rate than crop production. This is causing a shift away from crops, like wheat and rice, towards coarse grains and oilseeds to meet demands for food, feed and biofuel.

TABLE 4: Top five items produced in 2013, thousand tonnes

| | 2000 | 2013 |
|-------------|-----------|-----------|
| Sugar cane | 1 256 380 | 1 877 110 |
| Maize | 592 479 | 1 016 740 |
| Rice, paddy | 599 355 | 745 710 |
| Wheat | 585 691 | 713 183 |
| Potatoes | 327 600 | 368 096 |

CHART 46: Top 20 rice producing countries, per capita

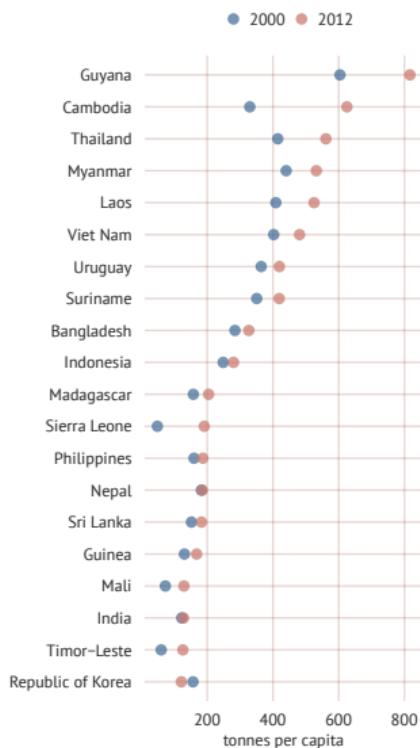


CHART 47: Top 20 wheat producing countries, per capita

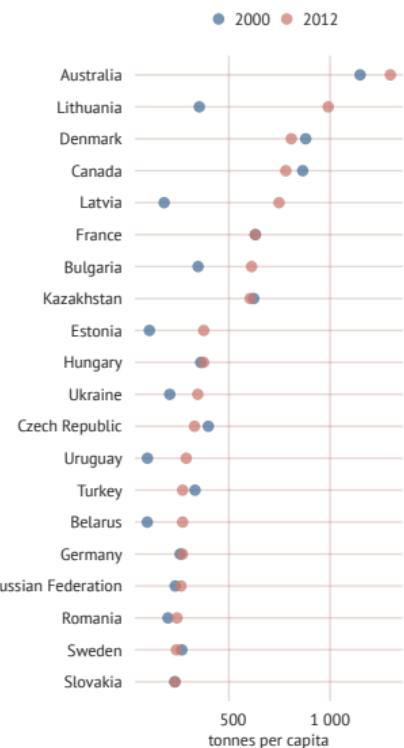


CHART 48: Cereals, yield

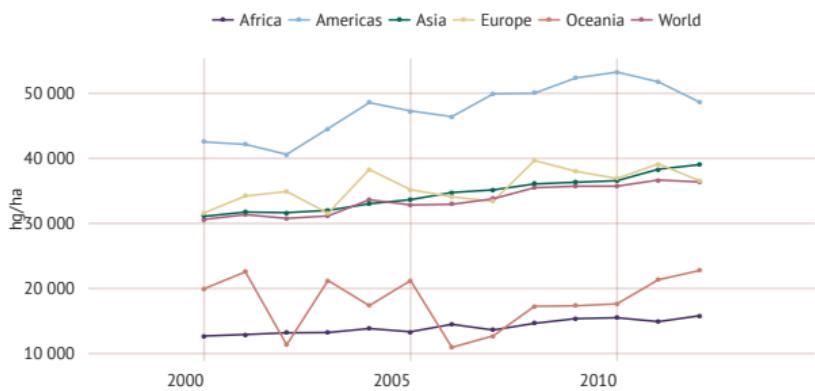
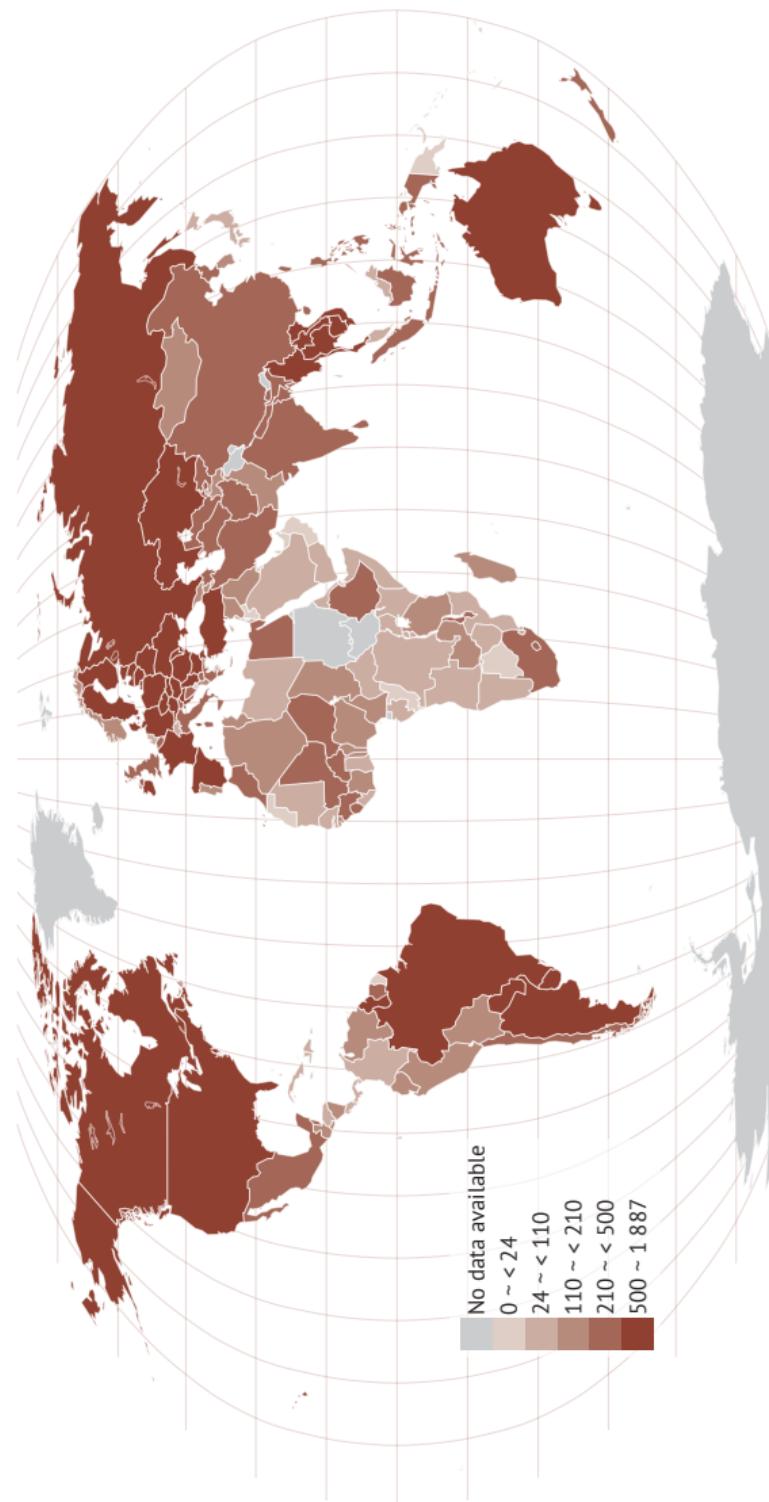


FIGURE 13: Cereal production, tonnes/cap (2013)



Livestock sector

The world food economy is being increasingly driven by the shift of diets towards animal-based products such as meat, milk and dairy. As a result, agriculture is being affected, not only through growth of livestock production, but also through linkages to other sectors that supply feeding stuffs, such as crops and fisheries. Globally livestock production is the largest user of agricultural land and therefore also leaves a significant imprint on the environment.

TABLE 5: Live animal production, top 5 in 2013 (thousand heads)

| | 2000 | 2013 |
|-----------|-----------|-----------|
| Cattle | 1 302 895 | 1 494 349 |
| Sheep | 1 059 082 | 1 172 833 |
| Goats | 751 632 | 1 005 603 |
| Pigs | 856 241 | 977 021 |
| Buffaloes | 164 114 | 199 784 |

CHART 49: Total milk production, top and bottom 10 countries (2012)

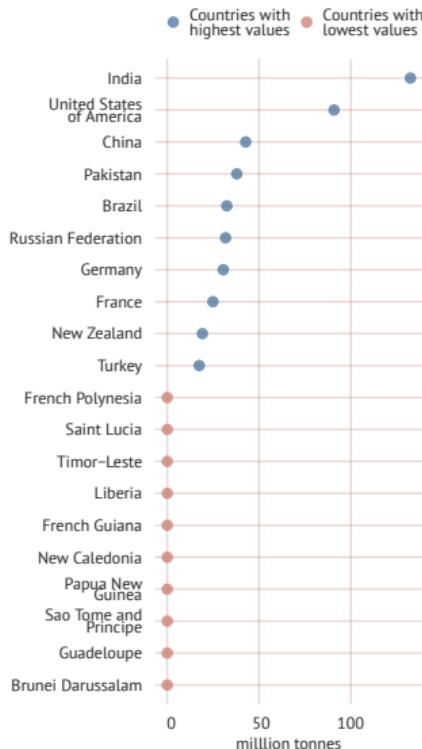


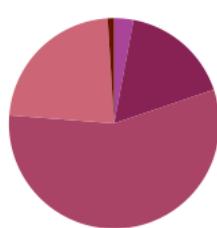
CHART 50: Total egg production, top and bottom 10 countries (2012)



CHART 51: Pig production (heads)

Africa Americas Asia Europe Oceania

2000



2013

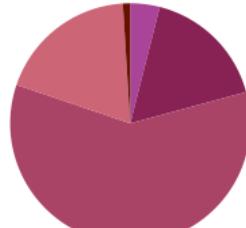
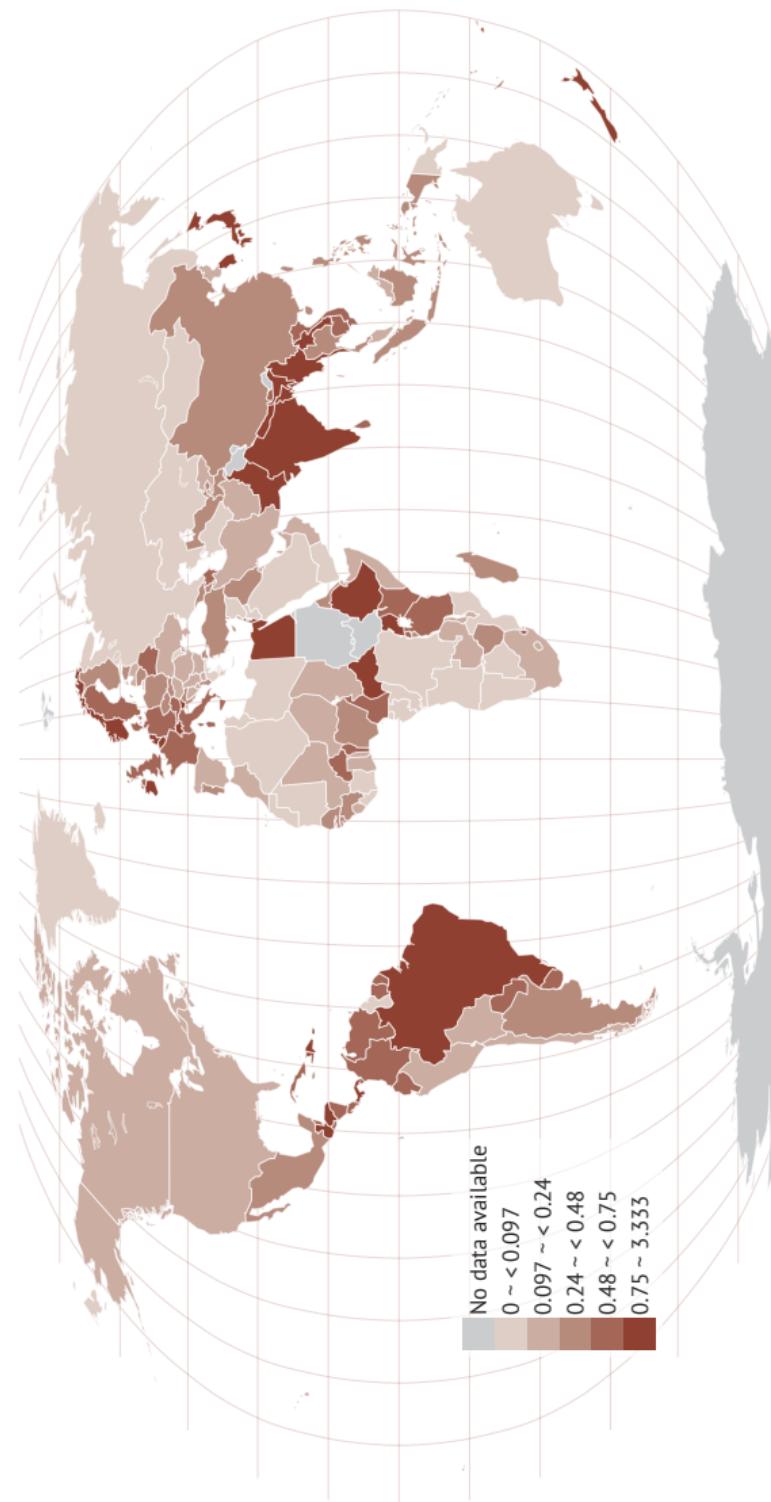


FIGURE 14: Cattle and buffaloes per ha of agricultural area, heads per ha (2012)



Fisheries sector

Fish is an important component in people's diets, providing about 3.1 billion people with almost 20 percent of their average intake of animal protein. Capture fisheries continue to dominate world output, but aquaculture accounts for a growing percentage of total fish supply. Fishery sectors are particularly important in developing countries, providing both food and livelihoods.

CHART 52: Per capita fish food supply

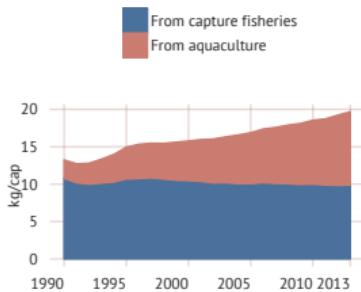


CHART 53: 20 countries with highest value of capture production (2013)

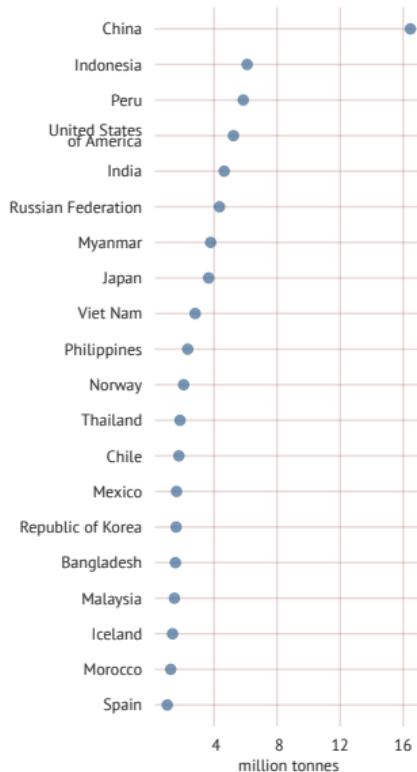


CHART 54: 20 countries with highest value of aquaculture production (2013)



CHART 55: State of the world's fishery stocks (1974 - 2011)

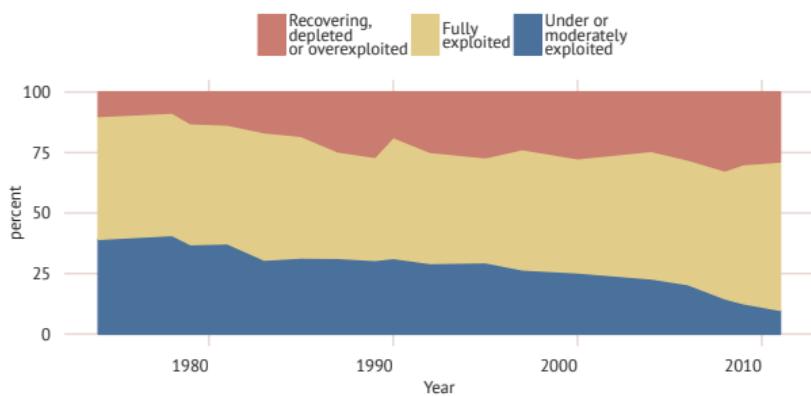
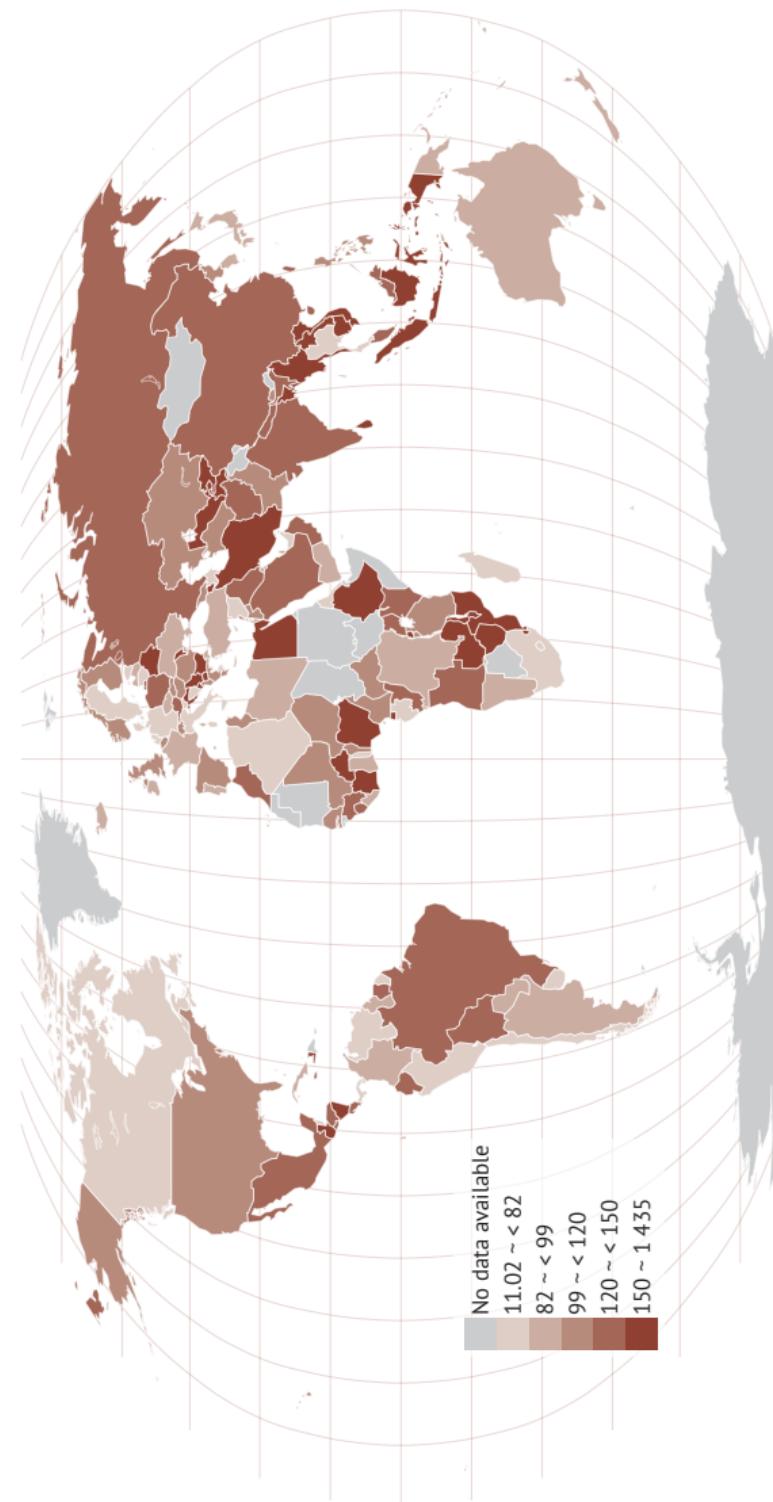


FIGURE 15: Fish production index (2004-06=100, 2013)



Agricultural trade

Most of the food consumed worldwide is grown locally. Where there is not enough local production to meet demand, trade has been instrumental in filling the gap. The scale of food and agricultural trade today is unprecedented. In real terms, the value of international flows has increased around fivefold over the past 50 years, reflecting global trends in the overall volume of trade. However, this expansion has been unevenly distributed across regions. High-income countries have generally outpaced developing regions, although several of the latter have comparative advantages in food and agricultural production.

TABLE 6: Exports and Imports of food, million US\$ (2012)

| | Export value | Import Value |
|----------|--------------|--------------|
| Europe | 403 | 418 |
| Asia | 160 | 264 |
| Americas | 266 | 159 |
| Africa | 29 | 64 |
| Oceania | 45 | 14 |

CHART 56: Top food importing countries in 2012

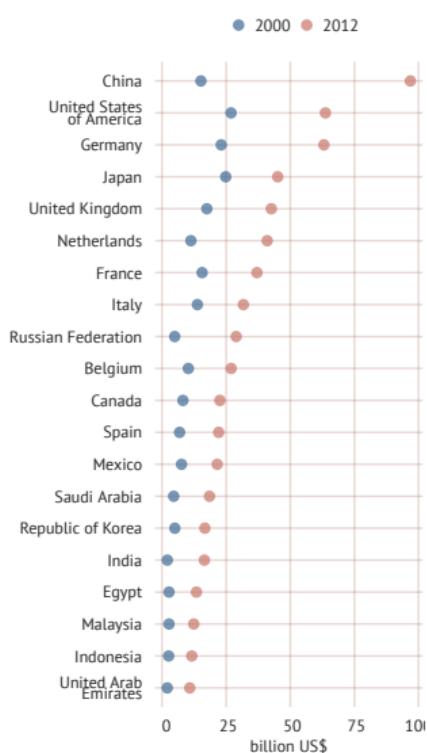


CHART 57: Top food exporting countries in 2012

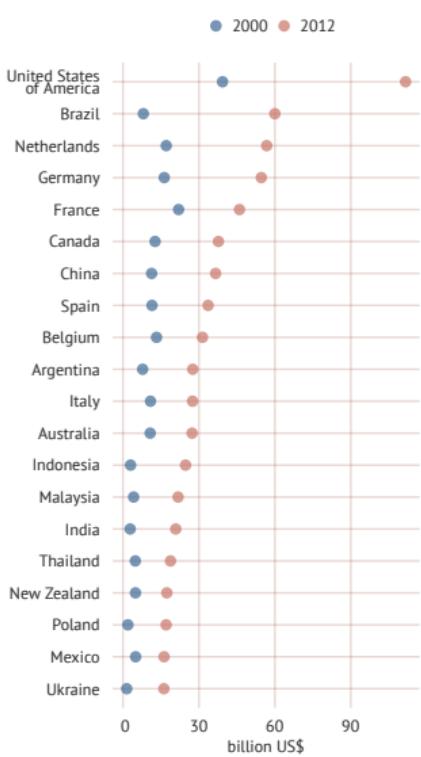


CHART 58: Cereal exports

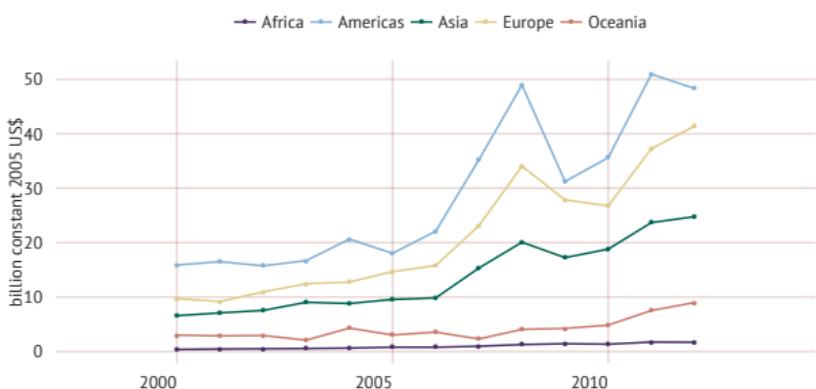
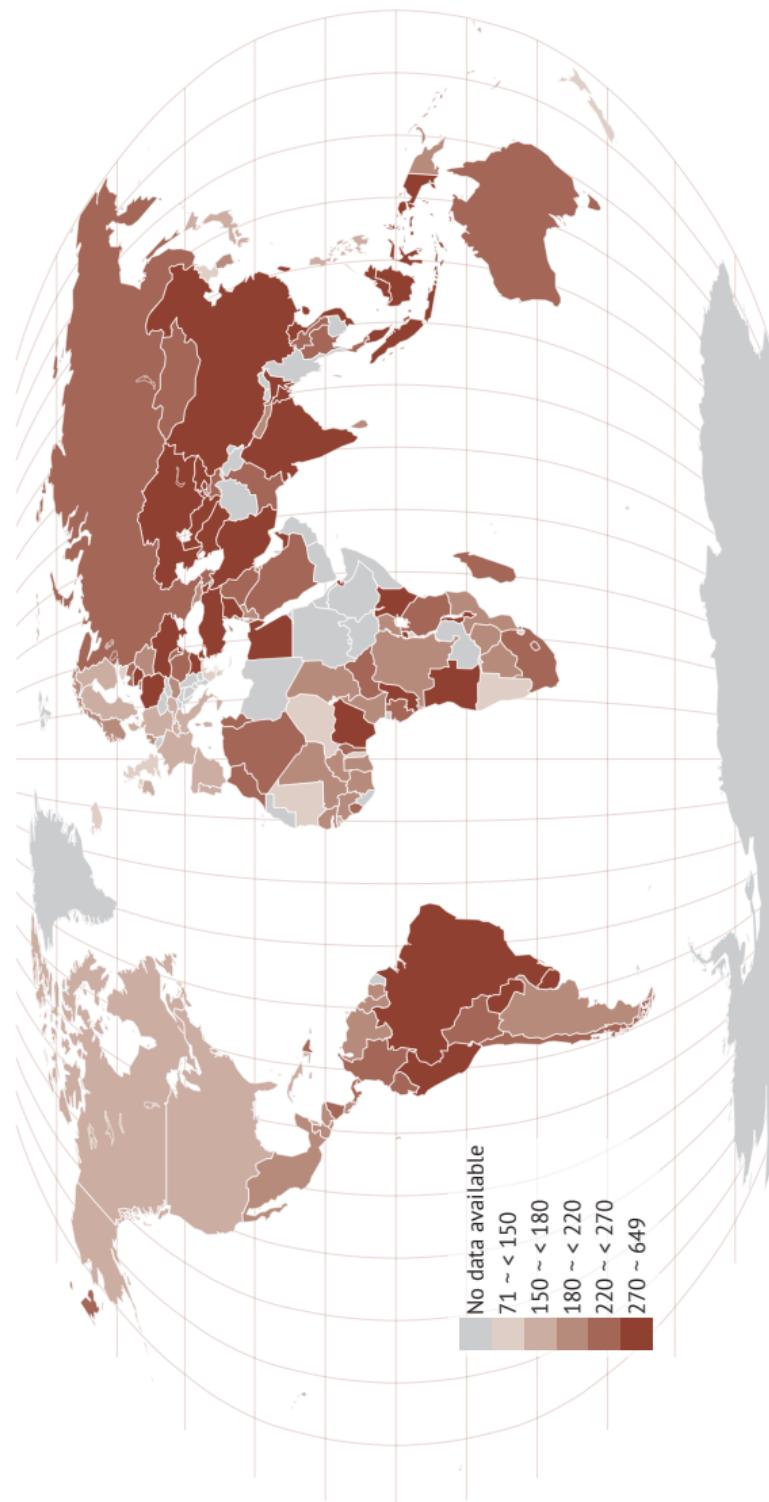


FIGURE 16: Import value index (2004-2006 = 100, 2011)



Land

Land is necessary for sustainable agricultural development, essential ecosystem functions and food security. More than 1.5 billion hectares – about 12 percent of the world's land area – are used for crop production. Although large amounts of land are potentially suitable for agriculture, much of it is covered by forests, protected for environmental reasons or are part of urban areas. Some 90 percent of agricultural land is in Latin America and sub-Saharan Africa. At the other extreme, there is almost none available for agricultural expansion in Southern Asia, the Western Asia and Northern Africa.

CHART 59: Land area

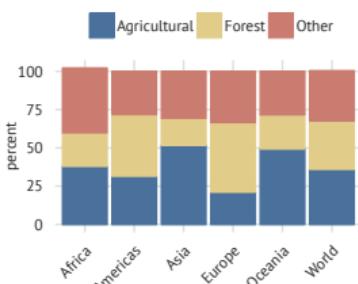


CHART 60: Arable land per capita, top 20 countries (2012)



CHART 61: Arable land per capita, bottom 20 countries (2012)



CHART 62: Agricultural area

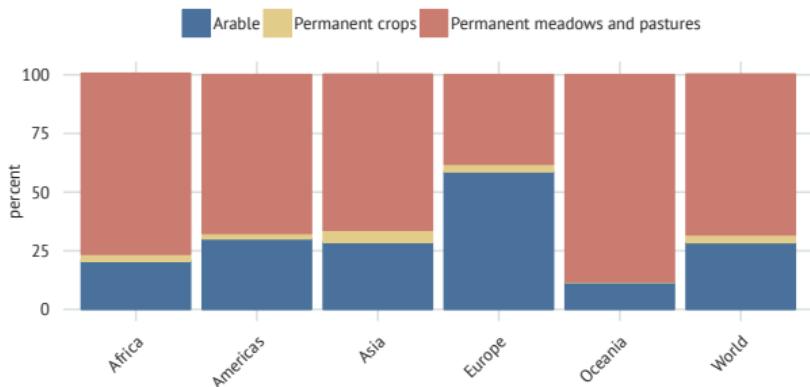
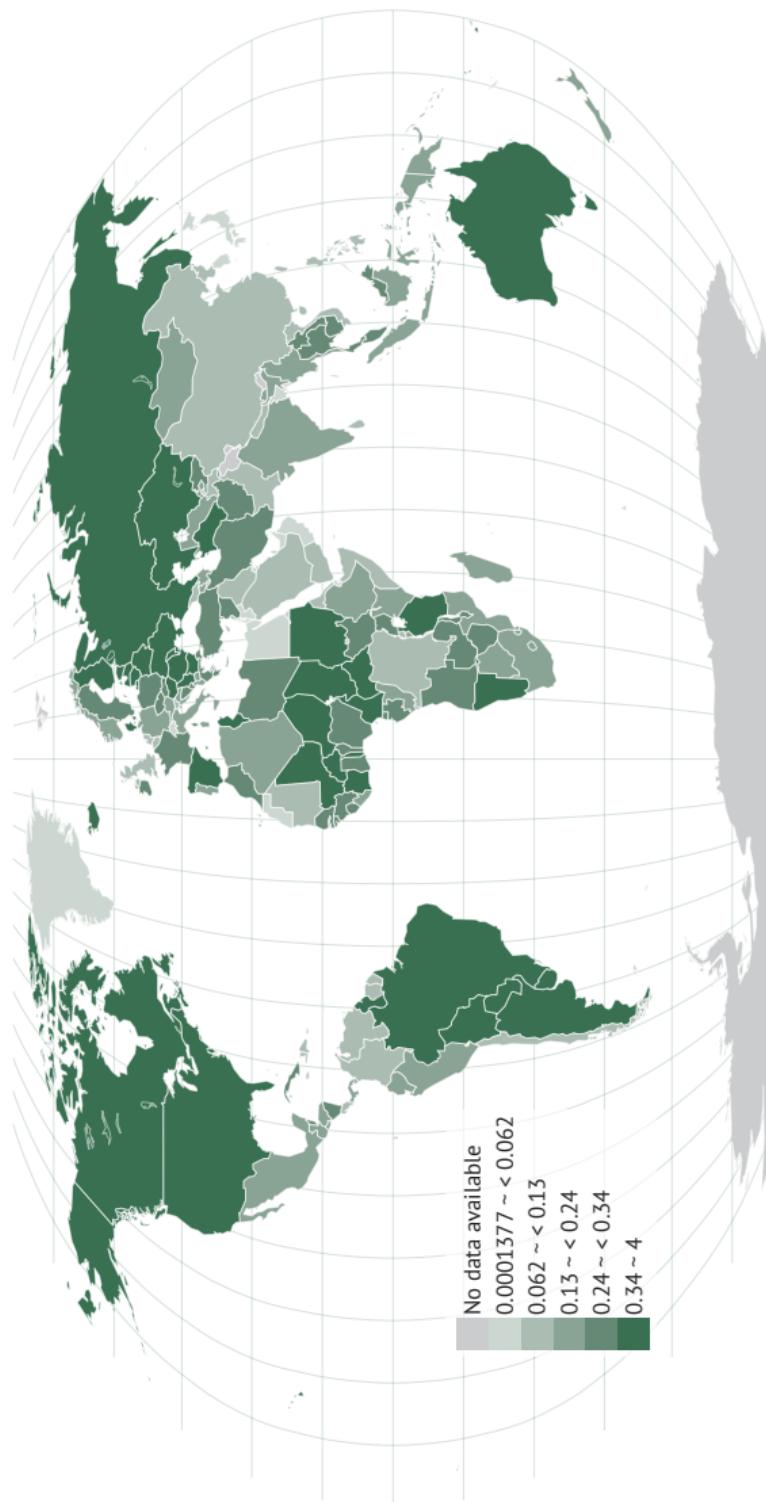


FIGURE 17: Cropland per capita, ha per cap (2012)



Water

Global demand for water has risen sharply over the last century. Total annual water withdrawal from agriculture, municipalities and industries rose from less than 580 km³ in 1900 to more than 3 900 km³ in 2010. Agriculture accounts for approximately 70 percent of total freshwater withdrawal in the world, mostly through irrigation. This has been crucial for gains in food production since irrigation reduces drought risk and encourages crop diversification, thus also enhancing rural incomes. While irrigated agriculture represents about 20 percent of the cultivated land, it contributes to 40 percent of global food production.

CHART 64: Freshwater withdrawal by industrial sector, share of total, highest 20 (1999 to 2013)

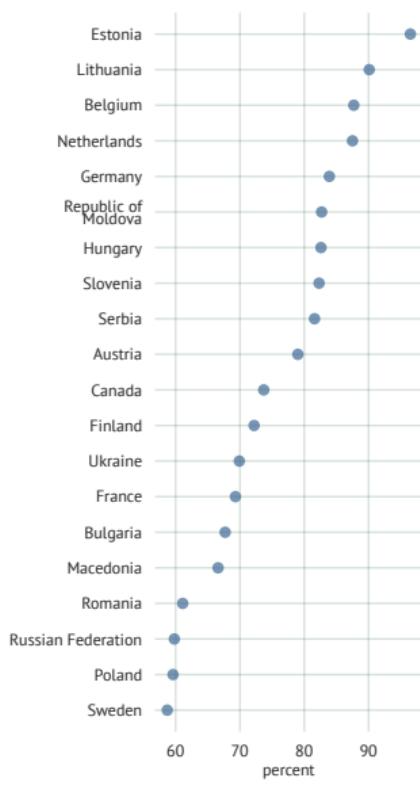


CHART 63: Countries with the lowest renewable water resources per capita

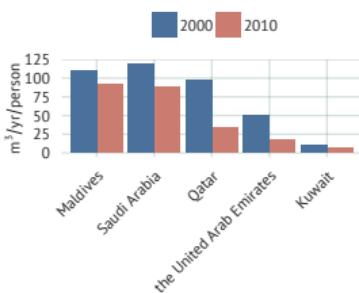


CHART 65: Freshwater withdrawal by agricultural sector, share of total, highest 20 (1999 to 2013)



CHART 66: Countries with the highest renewable water resources per capita

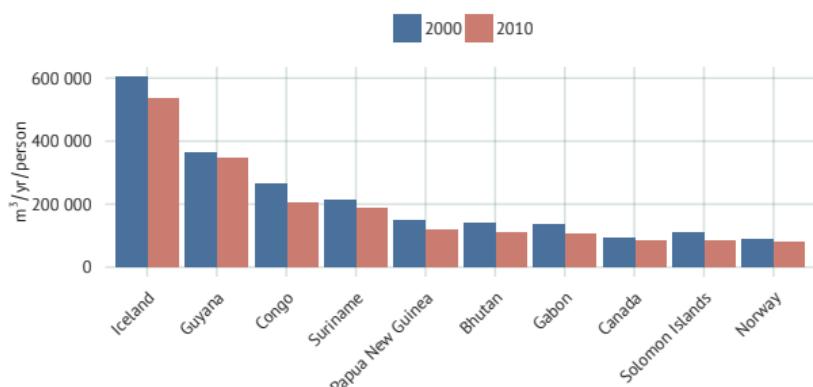
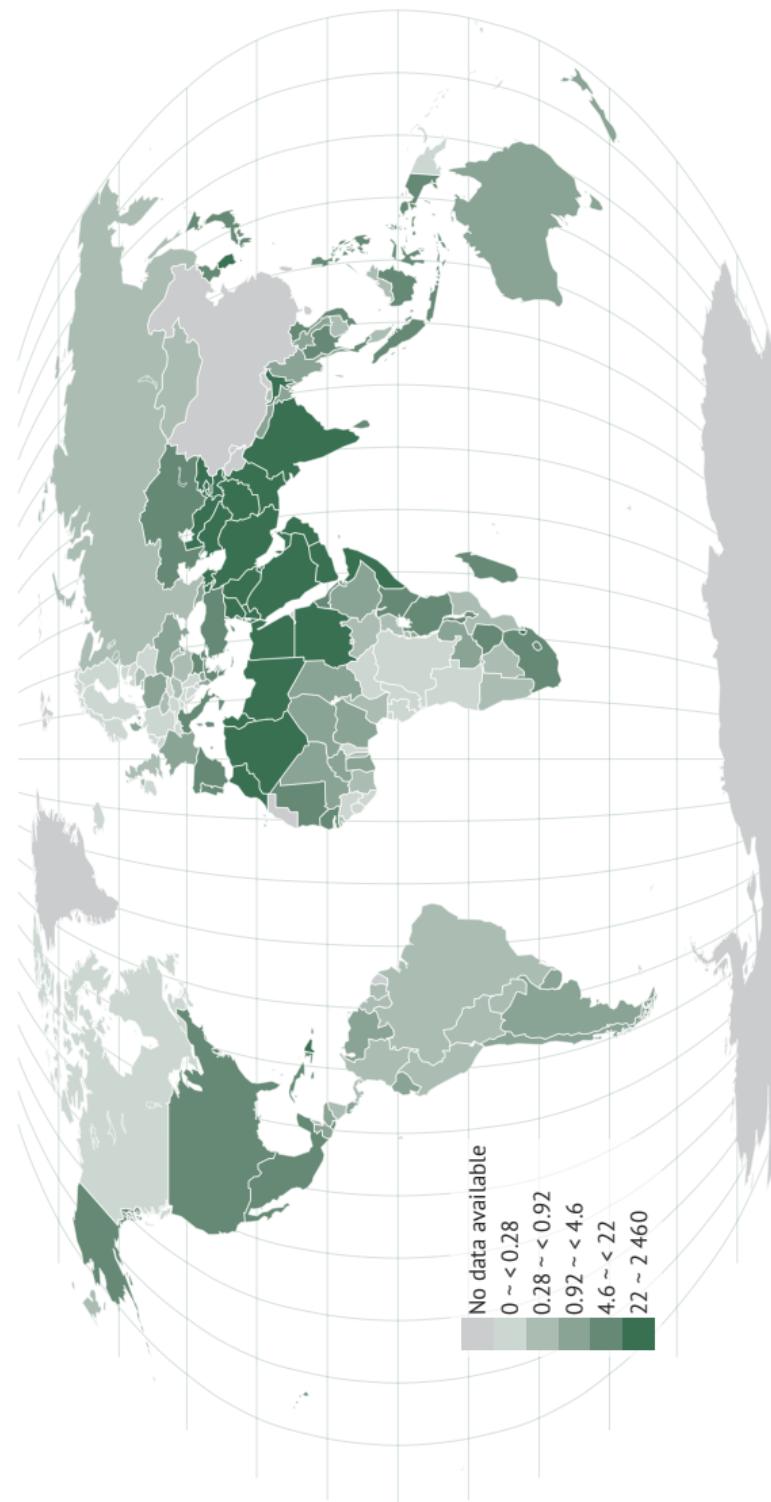


FIGURE 18: Freshwater resources withdrawn by agriculture (percent, 1999-2013*)



Energy

Energy is an important input for agri-food chain and is used to power agricultural machinery, to heat greenhouses, to power irrigation systems, among others, but also to manufacture equipment, fertilizers, pesticides and other agro-chemicals. The amount of energy consumed by agriculture is increasing worldwide as mechanization, especially in developing countries, increases, both in absolute terms and per unit of land. At the same time agriculture produces energy in the form of bioenergy. Bioenergy production increased sharply over the last years to meet the new demand for liquid biofuels for transport (e.g., ethanol and biodiesel) and solid biomass for power such as pellets or wood chips.

CHART 67: Global wood pellet production

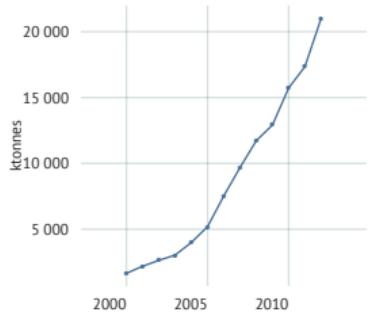


CHART 68: Total energy consumption in agriculture, top 20 countries (2012)

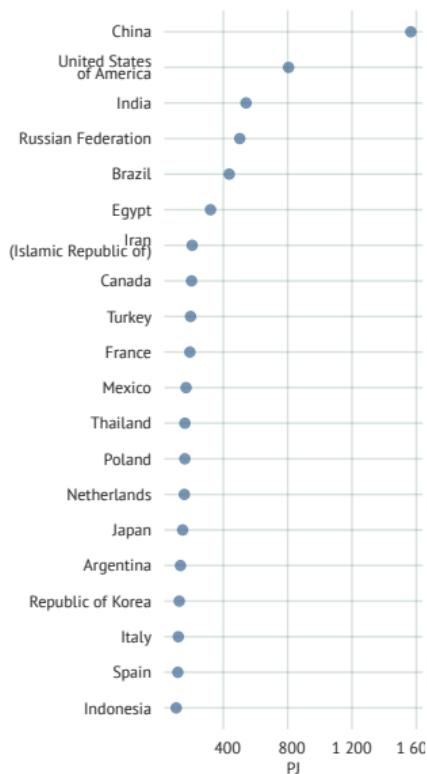


CHART 69: Bioenergy as a % of total renewable energy, selected countries (2012)



CHART 70: Biodiesel, biogas, biogasoline and other bio-oil consumption

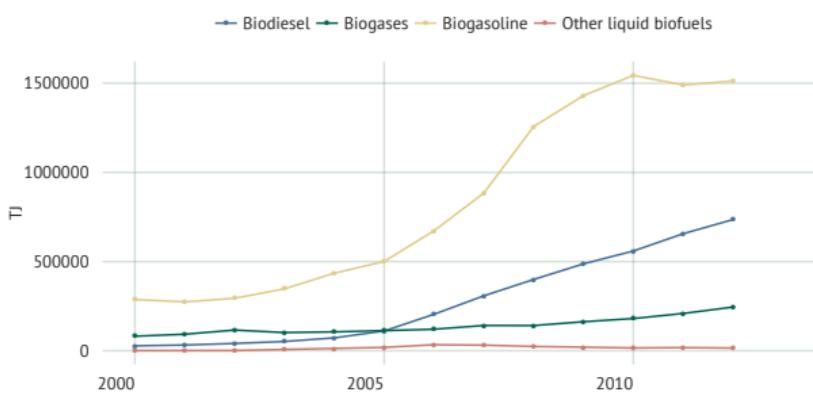
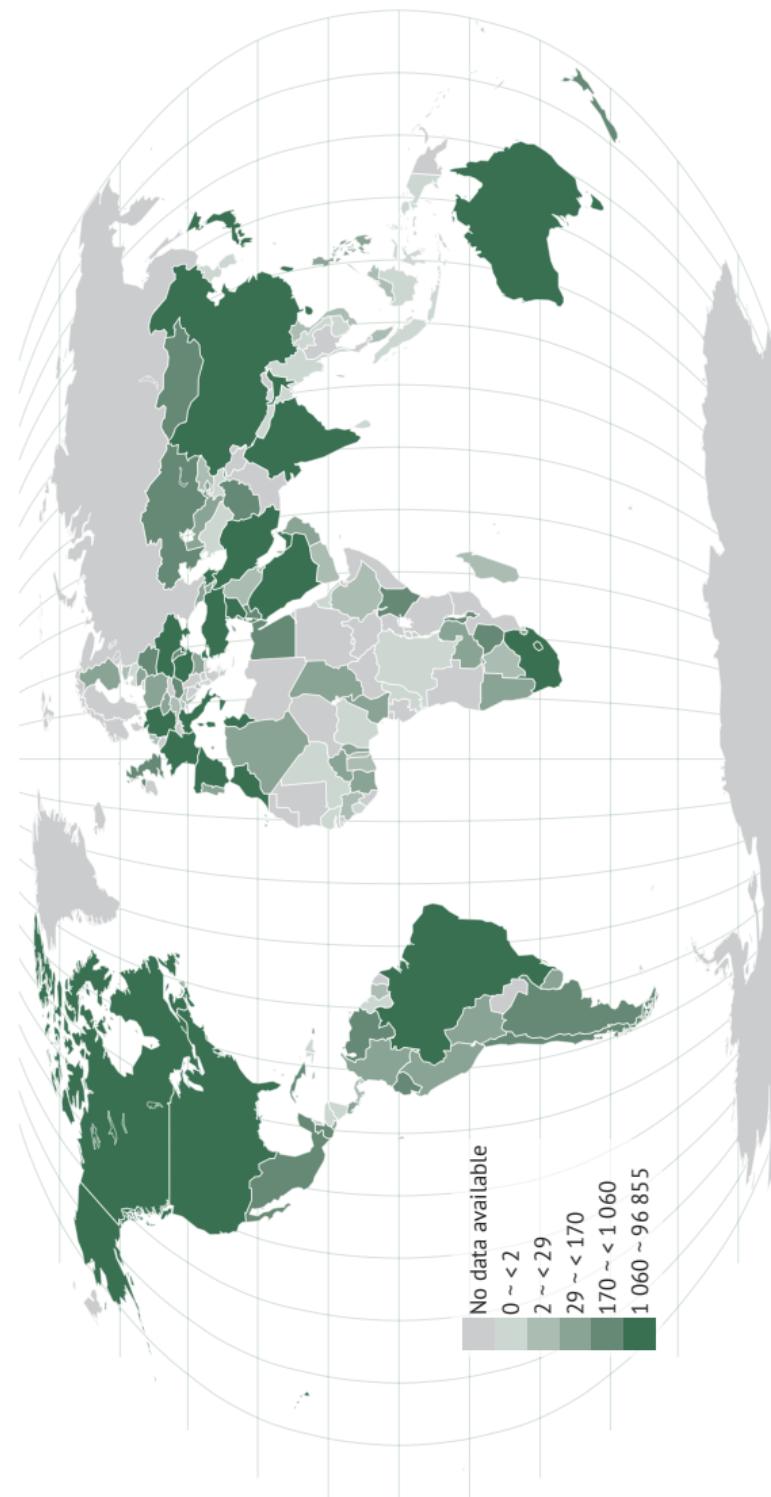


FIGURE 19: Energy consumption for power irrigation, million kWh (2011)



Forestry

Forests make vital contributions to biodiversity. They also sustain a range of economic activities and act as a source of food, medicine and fuel for more than a billion people. The latest estimate of the world's total forest area is more than 4 billion hectares, corresponding to about 30 percent of total land area. But today forests face unprecedented pressures. Changes in land cover have caused the most pressing environmental issue in recent decades. The impact of deforestation and land use intensification, especially on soil degradation, have been significant.

CHART 71: Production of selected forest products

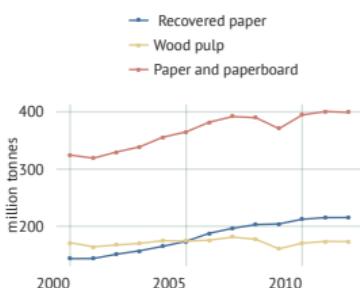


CHART 72: Top 20 exporters of forest products (2012)



CHART 73: Top 20 importers of forest products (2012)



CHART 74: Forest characteristics (2010)

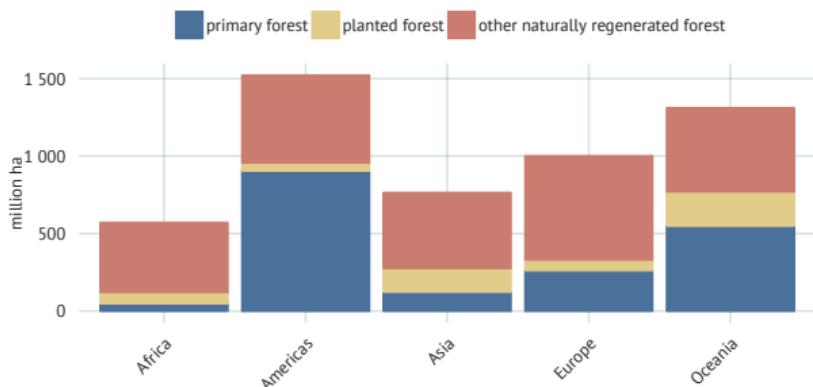
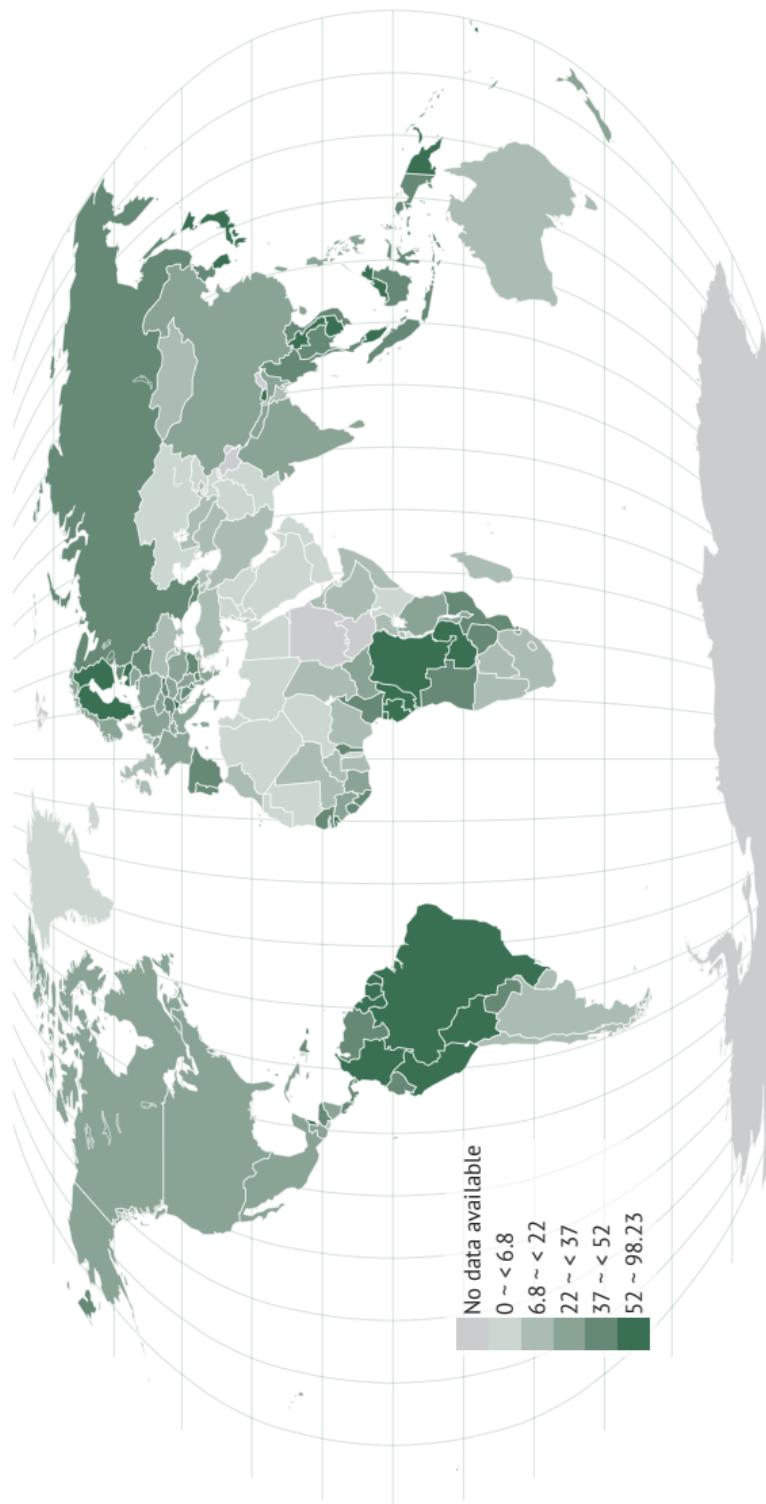


FIGURE 20: Forest area as share of total land area, percent (2012)



Climate change

The severity and speed of climate change is presenting an unprecedented challenge. Current global surface temperatures are now about 0.6 degrees Celsius higher than the average for the last century. This increase is consistent with model predictions of the effects of rising atmospheric concentrations of carbon dioxide (CO₂) and other GHGs, which are a result of human activity. The poorest and most food-insecure regions around the globe are the most vulnerable. Already scarce land and water resources will likely become even more scarce, and insufficient technical and financial means will make adaptation to a changing climate very difficult.

CHART 75: Greenhouse gas emissions in agriculture

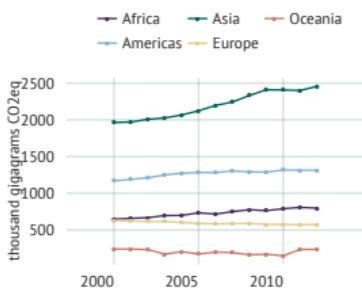


CHART 76: Greenhouse gas emissions in agriculture, highest 20 countries in 2012



CHART 77: Land use total emissions, highest 20 countries in 2012

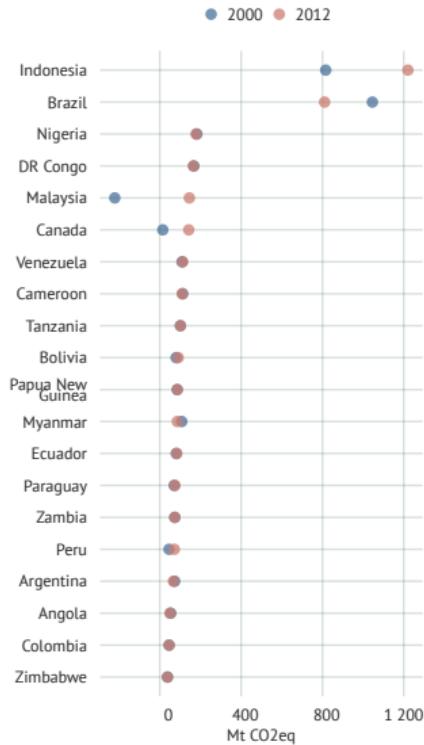


CHART 78: Emissions by subsectors in 2012

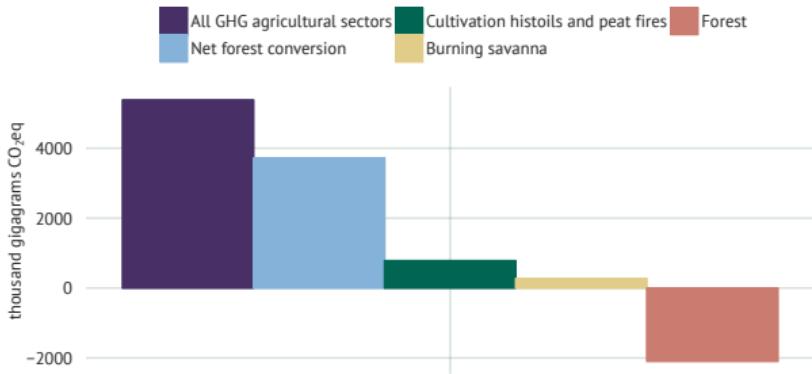


FIGURE 21: Total greenhouse gas emissions from agriculture, forestry and other land use, gigagrams CO₂ eq (2012)

