

What does “agriculture” mean today? Assessing old questions with new evidence.

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Introduction

One of global society's foremost structural changes underway is its rapid aggregate shift from farm-based to city-based economies. More than half of humanity now lives in urban areas, and more than two-thirds of the world's economies have a majority of their population living in urban settings.¹ Much of the gradual movement from rural to urban areas is driven by long-term forces of economic progress. But one corresponding downside is that city-based societies become increasingly disconnected—certainly physically, and likely psychologically—from the practicalities of rural livelihoods, especially agriculture, the crucial economic sector that provides food to fuel humanity.

The nature of agriculture is especially important when considering the tantalizingly imminent prospect of eliminating extreme poverty within a generation. The majority of the world's extremely poor people still live in rural areas, where farming is likely to play a central role in boosting average incomes. Agriculture is similarly important when considering environmental challenges like protecting biodiversity and tackling climate change. For example, agriculture and shifts in land use are responsible for roughly a quarter of greenhouse gas emissions.

As a single word, the concept of “agriculture” encompasses a remarkably diverse set of circumstances. It can be defined very simply, as at dictionary.com, as “the science or occupation of cultivating land and rearing crops and livestock.” But underneath that definition lies a vast array of landscape ecologies and climates in which different types of plant and animal species can grow. Focusing solely on crop species, each plant grows within a particular set of respective conditions. Some plants provide food—such as grains, fruits, or vegetables—that people or livestock can consume directly for metabolic energy. Other plants provide stimulants or medication that humans consume—such as coffee or Artemisia—but have no caloric value. Still others provide physical materials—like cotton or rubber—that provide valuable inputs to physical manufacturing.

One of the primary reasons why agriculture's diversity is so important to understand is that it defines the possibilities, and limits, for the diffusion of relevant technologies. Some crops, like wheat, grow only in temperate areas, so relevant advances in breeding or plant productivity might be relatively easy to diffuse across similar agro-ecological environments but will not naturally transfer to tropical environments, where most of the world's poor reside. Conversely, for example, rice originates in lowland tropical areas and it has historically been relatively easy to adopt farming technologies from one rice-growing region to another. But, again, its diffusion is limited by geography and climate. Meanwhile maize can grow in both temperate and tropical areas, but its unique germinating properties render it difficult to transfer seed technologies across geographies.

¹ According to the World Bank (2016), as of 2014, 53.4 percent of the world's population was living in urban areas and 133 of 212 economies with data had at least 50 percent of their population living in urban areas.

Given the centrality of agriculture in many crucial global challenges, including the internationally agreed Sustainable Development Goals recently established for 2030, it is worth unpacking the topic empirically to describe what the term actually means today. This short paper does so with a focus on developing country crops, answering five basic questions:

1. What types of crops does each country grow?
2. Which cereals are most prominent in each country?
3. Which non-cereal crops are most prominent in each country?
4. How common are “cash crops” in each country?
5. How has area harvested been changing recently?

Readers should note that the following assessments of crop prominence are measured by area harvested, and therefore do not capture each crop’s underlying level of productivity or overarching importance within an economy. For example, a local cereal crop might be worth only \$200 per ton of output in a country, but average yields might vary across a spectrum from around 1 to 6 tons per hectare (or even higher). Meanwhile, an export-oriented cash crop like coffee might be worth \$2,000 per ton, with potential yields ranging from roughly half a ton to 3 or more tons per hectare. Thus the extent of area harvested forms only one of many variables required for a thorough understanding of local agricultural systems.

The underlying analysis for this paper was originally conducted for a related book chapter on “Agriculture’s role in ending extreme poverty” (McArthur, 2015). That chapter addresses similar questions for a subset of 61 countries still estimated to be struggling with extreme poverty challenges as of 2011. Here we present data for a broader set of 140 developing countries.² All tables are also available online for download.

² Note that some variables have been updated since the results presented in McArthur (2015). In particular, all tree nuts, chilies, dried flowers, kola nuts, hops and gums are now included under Cash Crops rather than Other crops, and the Other category has been removed.

Methodology

Data for the analysis are drawn from the U.N. Food and Agriculture Organization's (FAO) online Crops Production dataset (FAO, 2014). Information is assessed for 140 developing countries with available data, all classified by the World Bank as low- or middle-income as of 2011. That year Russia was still officially listed as a developing country, but was also a member of the Group of Eight industrialized nations. It is therefore excluded from the sample.

As described in more detail in Appendix 1, the dataset provides information on area harvested for individual crops and major crop aggregates. For reasons of data availability, this paper focuses on crops for human use, separate from fodder crops. The underlying measurements are not presumed to be precise, in line with Jerven (2010), but they are nonetheless assumed to provide a useful approximation of current crop distribution and medium-term changes since 2000.

The area harvested variable provides a snapshot of each country's general composition of crops. Note that this measure is distinct from area planted, which would include both harvested area and additional area with failed crops. The paper does not look at measures of production volume, since it is difficult to aggregate comparable units across crops that each has its own norms for shape, weight, caloric density, and value per unit of land. Instead, underlying FAO data are synthesized to estimate a simple area harvested variable for each of six mutually exclusive crop categories:

- cereals (e.g., maize, rice, wheat)
- roots and tubers (e.g., cassava, potatoes)
- oils (e.g., soybean, groundnut, rapeseed)
- pulses (e.g., dry beans, lentils, chick-peas)
- fruits and vegetables (e.g., cabbage, tomato, banana)
- “cash crops” (e.g., cocoa, coffee, rubber, cotton, tobacco, spices)

Values for area harvested are estimated for each country for both 2000 and 2010. To avoid potential year-to-year aberrations, observations are calculated as three-year averages, i.e., 1999–2000–2001 and 2009–2010–2011. Note that current information on crops harvested does not pre-define which crops could suitably be planted in each location in the future. Site-specific measures of agronomic potential are required for that type of assessment.

A general caveat should be noted regarding the country-level form of data presented here. Maps plotting crops by sovereign political boundaries rather than by specific agricultural growing area can lead to considerable visual distortions, especially in countries where farmland is geographically concentrated. For more precise geospatial representations of global crop areas, interested readers are encouraged to consult studies like Beddow and colleagues (2010), Monfreda and colleagues (2008), and Fischer and colleagues (2014).

Results

1. What types of crops does each country grow?

Table 1 shows the distribution of major crop categories as a share of total area harvested in each sample country, organized by World Bank geographic region. The chart shows that cereals most commonly account for the plurality—and often the majority—of area harvested. However, it also indicates considerable cross-country variation, even within regions. For example, roots and tubers are the most prevalent crop (again, measured by area harvested) in countries like the Central African Republic, the Republic of Congo, the Democratic Republic of Congo, Gabon, and Rwanda. Pulses and other cash crops are spread unevenly around the world. Meanwhile, fruits and vegetables are most prevalent in only a limited number of countries—including Burundi, Lebanon, Montenegro, and Uganda—in addition to a handful of small island states like Dominica, Grenada, Maldives, Papua New Guinea, and Tonga.

Figure 1 presents a map of the most prevalent crop category in each developing country. The common dominance of cereals is visually striking. So too, however, is the prominence of roots and tubers in central Africa; the prevalence of oils in much of South America; and the very limited number of countries with major concentrations of cash crops.

Figure 1: Crop with largest share of area harvested, 2010

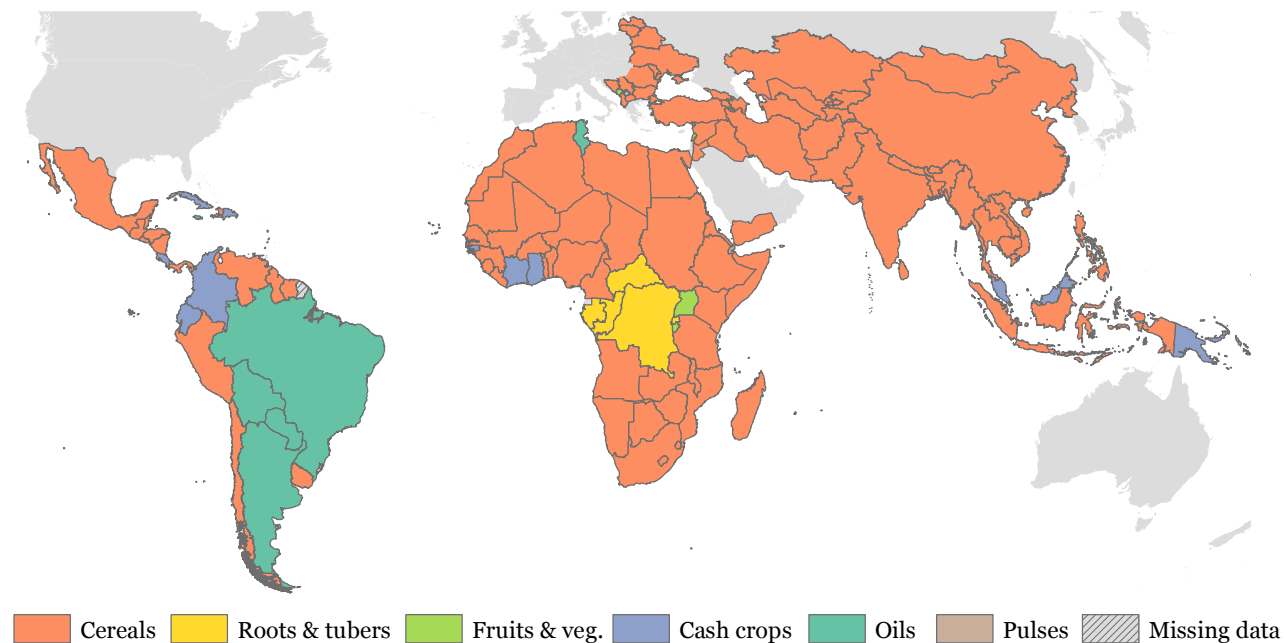


Table 1: Share of area harvested by major crop groups, 2010 (3 year period average)

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Sub-Saharan Africa						
Angola	41	8	27	17	6	2
Benin	37	15	15	5	4	24
Botswana	77	5	4	12	3	
Burkina Faso	59	15		17	1	7
Burundi	19	2	18	22	35	4
Cabo Verde	49	3	2	40	4	2
Cameroon	29	11	10	10	16	24
Central African Republic	21	29	34	3	8	5
Chad	66	21	3	5	1	4
Comoros	20	32	15	13	11	9
Congo	9	16	43	4	16	13
Côte d'Ivoire	11	4	17	1	10	57
Democratic Republic of the Congo	32	11	35	7	8	7
Eritrea	75	10	3	9	3	
Ethiopia	65	6	6	10	3	10
Gabon	10	10	37		32	11
Gambia	63	32	1	2	1	2
Ghana	25	7	24	4	7	33
Guinea	56	8	6	2	14	14
Guinea-Bissau	31	9	4	2	6	48
Kenya	49	5	5	25	6	10
Lesotho	84		3	9	4	
Liberia	44	3	13	1	10	30
Madagascar	53	3	20	3	8	12
Malawi	48	11	10	18	5	8
Mali	75	12		5	2	5
Mauritania	61	1	1	34	3	
Mauritius		1	2		10	87
Mozambique	38	16	20	17	3	7
Namibia	81		11	4	4	
Niger	62	6		31	1	
Nigeria	38	11	20	7	9	15
Rwanda	21	5	26	20	25	3
Sao Tome and Principe	3	29	10		15	43
Senegal	50	39	1	5	3	2
Seychelles		26	1		31	42

Table 1 continued

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Sierra Leone	43	8	29	8	6	7
Somalia	69	12	1	9	6	3
South Africa	64	19	2	1	8	6
Sudan (former)	70	22	1	3	3	1
Swaziland	37	6	8	4	10	34
Tanzania	40	18	13	12	9	8
Togo	49	9	13	12	2	15
Uganda	21	16	14	15	27	7
Zambia	53	20	12	3	3	9
Zimbabwe	62	18	2	2	2	14
South Asia						
Afghanistan	86	2	1	2	7	2
Bangladesh	79	3	3	2	6	7
Bhutan	57	2	7	3	18	13
India	49	20	1	13	7	11
Maldives	2	24	11	2	51	10
Nepal	70	9	4	6	8	3
Pakistan	56	15	1	7	5	17
Sri Lanka	49	19	2	1	8	22
East Asia & Pacific						
American Samoa		44	44		11	1
Cambodia	81	4	7	2	4	2
China	51	16	5	2	20	6
Democratic People's Republic of Korea	47	11	6	13	19	4
Fiji	3	43	13	3	4	35
Indonesia	43	11	4	1	4	37
Kiribati		89	4		5	1
Lao People's Democratic Republic	73	4	2	1	13	7
Malaysia	11	4			2	83
Marshall Islands		100				
Micronesia (Federated States of)	1	85	7		7	
Mongolia	90	2	5		3	1
Myanmar	48	21		21	4	5
Papua New Guinea		21	20		23	35
Philippines	51	26	3	1	14	7
Samoa		62	11		22	6

Table 1 continued

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Solomon Islands	1	52	14	5	2	26
Thailand	64	2	6	1	8	19
Timor-Leste	44	9	10	4	6	27
Tonga		42	9		47	2
Tuvalu		92			8	
Vanuatu	1	89	5		2	2
Viet Nam	64	4	5	3	10	14
Middle East & North Africa						
Algeria	68	8	3	2	19	1
Djibouti				53	44	3
Egypt	56	6	3	2	23	9
Iran (Islamic Republic of)	69	4	1	6	14	6
Iraq	77	3	1	1	18	1
Jordan	33	31	3	2	31	2
Lebanon	21	25	6	2	39	7
Libya	46	27	2	1	17	7
Morocco	72	12	1	5	7	3
Syrian Arab Republic	61	18	1	5	7	8
Tunisia	32	48	1	3	10	7
West Bank and Gaza	18	56	1	2	18	3
Yemen	71	4	2	4	14	6
Latin America & Caribbean						
Antigua and Barbuda	1	18	4		59	18
Argentina	29	64		1	2	3
Belize	35	1		10	25	30
Bolivia	30	42	7	2	7	11
Brazil	29	37	3	6	4	22
Chile	47	3	4	3	37	5
Colombia	28	2	9	4	19	38
Costa Rica	14	1	10	4	33	39
Cuba	22	1	13	7	27	29
Dominica	1	12	19	1	42	25
Dominican Republic	22	3	4	8	18	45
Ecuador	32	3	3	3	25	35
El Salvador	48	2	1	13	6	30
Grenada	4	20	8	7	36	25
Guatemala	41	3	1	12	11	32
Guyana	59	9	2	1	8	22

Table 1 continued

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Haiti	42	3	20	10	14	10
Honduras	41		1	11	8	39
Jamaica	1	31	8	1	29	29
Mexico	61	4		9	13	13
Nicaragua	46	4	2	25	5	19
Panama	52	2	3	6	14	24
Paraguay	29	61	4	2	2	3
Peru	40	2	15	7	18	19
Saint Lucia		32	13		49	6
Saint Vincent and the Grenadines		7	21	3	51	17
Suriname	84	1			8	7
Uruguay	52	44	1		2	
Venezuela	54	8	4	3	12	20
Europe & Central Asia						
Albania	47	14	3	7	25	4
Armenia	59		11	1	28	1
Azerbaijan	71	4	5	1	16	4
Belarus	67	10	10	3	5	5
Bosnia and Herzegovina	49	1	6	2	41	2
Bulgaria	60	31			6	3
Georgia	50	3	5	2	32	7
Kazakhstan	88	9	1		1	1
Kyrgyzstan	63	9	9	3	11	5
Latvia	77	16	4		2	
Lithuania	74	16	3	3	2	1
Macedonia	50	4	4	6	28	8
Montenegro	11	5	23	3	57	1
Republic of Moldova	55	22	2	2	17	2
Romania	69	18	3	1	8	1
Serbia	64	12	3	2	17	3
Tajikistan	42	18	3	2	17	18
Turkey	64	11	1	5	12	9
Turkmenistan	40	26	2		4	28
Ukraine	61	27	6	1	3	2
Uzbekistan	32	28	1		10	28

Source: FAOSTAT (2014)

Note: Figures are rounded to nearest percentage point. Values less than 0.5 percent not included.

2. Which cereals are most prominent in each country?

Figure 2 maps the concentration of cereal area harvested by country. This matches the “total” column on the far right of Table 2, which presents a decomposition of area harvested to cereals in each country, with emphasis on the three most common cereals: rice, maize, and wheat. A fourth column in the same table indicates the extent of “other” cereals. In cases where “other” accounts for at least 10 percent of area harvested, the leading individual crops under that category are also listed. The same column is further unpacked in Table 3, which lists the specific types of cereals for the subset of countries where “other” cereals account for at least 10 percent of area harvested. Figure 3 then maps the major cereal for each country where a single cereal accounts for at least 20 percent of area harvested.

Figure 2: Degree of cereal intensity
Percent of total area harvested to cereals in 2010

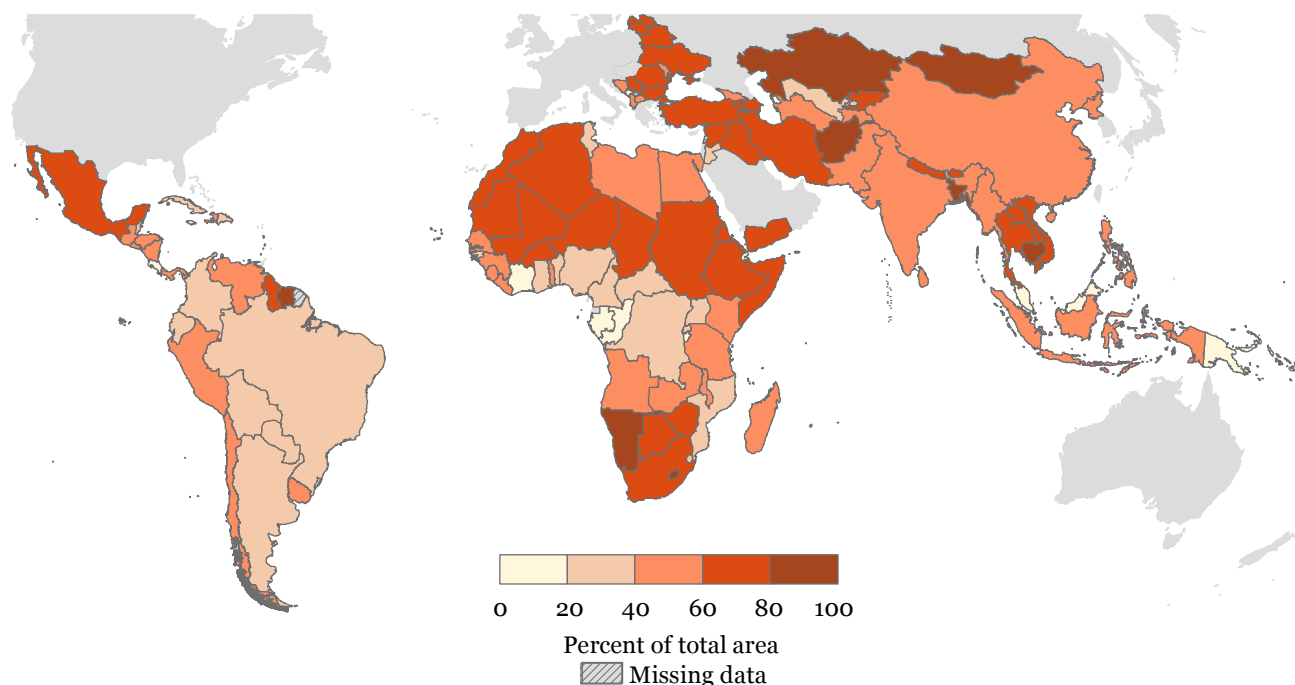


Table 2: Share of area harvested by major cereal crops, 2010 (3 year period average)

Country	Rice	Maize	Wheat	Other (Largest)	TOTAL
Sub-Saharan Africa					
Angola	1	36		5	41
Benin	2	30		5	37
Botswana		40		36 (sorghum)	77
Burkina Faso	2	11		47 (sorghum)	59
Burundi	2	10	1	6	19
Cabo Verde		49			49
Cameroon	2	14		14 (sorghum)	29
Central African Republic	2	13		6	21
Chad	3	6		57 (millet, sorghum)	66
Comoros	18	2			20
Congo	1	4		5	9
Côte d'Ivoire	5	4		2	11
Democratic Republic of the Congo	7	24		1	32
Eritrea		3	4	67 (sorghum)	75
Ethiopia		13	11	41 (sorghum)	65
Gabon		10			10
Gambia	15	9		38 (millet)	63
Ghana	3	15		7	25
Guinea	25	14		17 (fonio)	56
Guinea-Bissau	20	3		8	31
Kenya		39	3	7	49
Lesotho		63	9	12 (sorghum)	84
Liberia	44				44
Madagascar	45	8			53
Malawi	2	43		3	48
Mali	13	10		52 (millet)	75
Mauritania	6	6		49 (sorghum)	61
Mauritius					
Mozambique	3	24		10 (sorghum)	38
Namibia		8	1	72 (millet)	81
Niger				62 (millet)	62
Nigeria	6	11		21 (sorghum)	38
Rwanda	1	10	2	7	21
Sao Tome and Principe		3			3
Senegal	5	5		40 (millet)	50
Seychelles					

Table 2 continued

Country	Rice	Maize	Wheat	Other (Largest)	TOTAL
Sierra Leone	36	2		4	43
Somalia		23		45 (sorghum)	69
South Africa		48	11	5	64
Sudan (former)			2	68 (sorghum)	70
Swaziland		36		1	37
Tanzania	8	23	1	9	40
Togo	3	30		17 (sorghum)	49
Uganda	1	13		7	21
Zambia	1	47	1	4	53
Zimbabwe		45		16 (sorghum, millet)	62
South Asia					
Afghanistan	6	5	69	7	86
Bangladesh	76	1	2		79
Bhutan	21	24	2	9	57
India	21	4	14	10 (millet)	49
Maldives		1		1	2
Nepal	31	18	15	6	70
Pakistan	11	4	38	3	56
Sri Lanka	46	2			49
East Asia & Pacific					
American Samoa					
Cambodia	75	6			81
China	17	18	14	2	51
Democratic People's Republic of Korea	20	18	2	6	47
Fiji	2				3
Indonesia	33	10			43
Kiribati					
Lao People's Democratic Republic	59	15			73
Malaysia	11				11
Marshall Islands					
Micronesia (Federated States of)					1
Mongolia			87	2	90
Myanmar	43	2	1	2	48
Papua New Guinea					
Philippines	32	19			51
Samoa					
Solomon Islands	1				1

Table 2 continued

Country	Rice	Maize	Wheat	Other (Largest)	TOTAL
Thailand	57	5		1	64
Timor-Leste	18	26			44
Tonga					
Tuvalu					
Vanuatu		1			1
Viet Nam	55	8			64
Middle East & North Africa					
Algeria			42	26 (barley)	68
Djibouti					
Egypt	10	17	24	5	56
Iran (Islamic Republic of)	4	3	50	12 (barley)	69
Iraq	2	4	45	26 (barley)	77
Jordan		1	9	23 (barley)	33
Lebanon		1	15	6	21
Libya			18	28 (barley)	46
Morocco		3	40	28 (barley)	72
Syrian Arab Republic		1	32	29 (barley)	61
Tunisia			19	13 (barley)	32
West Bank and Gaza			12	6	18
Yemen		4	11	55 (sorghum)	71
Latin America & Caribbean					
Antigua and Barbuda		1			1
Argentina	1	9	13	6	29
Belize	5	23		7	35
Bolivia	6	11	6	7	30
Brazil	4	20	3	2	29
Chile	2	10	23	11 (oats)	47
Colombia	13	14		1	28
Costa Rica	12	2			14
Cuba	11	11			22
Dominica		1			1
Dominican Republic	20	2			22
Ecuador	15	14		2	32
El Salvador	1	35		13 (sorghum)	48
Grenada		4			4
Guatemala		39		1	41
Guyana	58	1			59
Haiti	4	28		10 (sorghum)	42
Honduras	1	35		5	41

Table 2 continued

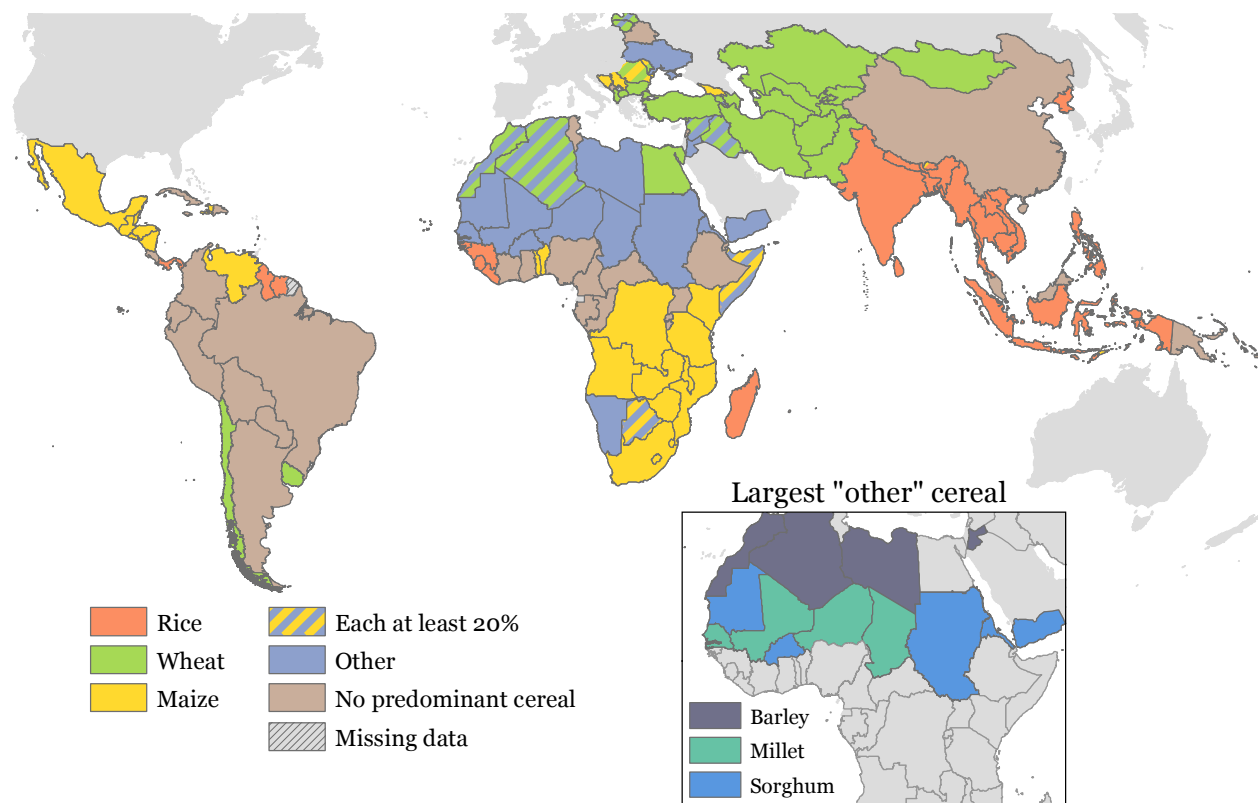
Country	Rice	Maize	Wheat	Other (Largest)	TOTAL
Jamaica		1			1
Mexico		43	5	13 (sorghum)	61
Nicaragua	8	34		4	46
Panama	35	17			52
Paraguay	1	16	11		29
Peru	12	16	5	7	40
Saint Lucia				(sorghum)	
Saint Vincent and the Grenadines					
Suriname	84				84
Uruguay	9	5	28	10 (barley)	52
Venezuela	12	30		12 (sorghum)	54
Europe & Central Asia					
Albania		18	24	5	47
Armenia		1	31	27 (barley)	59
Azerbaijan		2	49	19 (barley)	71
Belarus		4	17	47 (barley)	67
Bosnia and Herzegovina		31	10	8	49
Bulgaria		11	39	9	60
Georgia		31	13	6	50
Kazakhstan	1	1	76	11 (barley)	88
Kyrgyzstan	1	8	41	13 (barley)	63
Latvia			44	33 (barley)	77
Lithuania		1	36	37 (barley)	74
Macedonia	1	9	24	15 (barley)	50
Montenegro		6	2	3	11
Republic of Moldova		26	21	8	55
Romania		31	28	10 (barley)	69
Serbia		41	17	6	64
Tajikistan	1	1	33	7	42
Turkey	1	3	43	17 (barley)	64
Turkmenistan	3	1	34	2	40
Ukraine		11	27	22 (barley)	61
Uzbekistan	1	1	29	2	32

Source: FAOSTAT (2014)

Note: In cases where “Other” crops account for at least 10 percent of area harvested, the leading individual crops under that category are also listed. Figures are rounded to nearest percentage point. Values less than 0.5 percent not included.

Figure 3: Predominant cereal

Where each cereal accounts for at least 20% of area harvested in 2010



Several patterns stand out in these tables and figures. First, there are some clear geographic commonalities in terms of which cereals are most common in each region, as shown in Figure 3. Maize is most prominent in Mexico, much of Central America, plus Eastern and Southern Africa. Across the Sahelian region, millet and sorghum are more dominant and in South America no single cereal stands out. Rice is more prominent in South and Southeast Asian countries with extensive lowland tropical areas. Wheat is prominent in the more temperate regions of the Middle East and North Africa plus Europe and Central Asia.

Looking more closely at Table 2, sub-Saharan Africa has very little wheat production and only a handful of countries with significant rice production, including Madagascar plus a few West African countries like Guinea, Liberia, and Sierra Leone. A small number of large countries have a mix of major cereals, linked to their domestic geographic diversity. For example, cereals account for nearly half of India's area harvested, spread broadly across rice (21 percent), wheat (14 percent), maize (4 percent) and other crops (10 percent). In China, just over half the harvested area is to cereals, comprised of 18 percent as maize, 17 percent rice, 14 percent wheat, and 2 percent other crops.

Table 3: Share of area harvested by “other” cereals in countries with more than 10% other, 2010 (3 year period average)

Country	Barley	Buckwheat	Fonio	Millet	Oats	Rye	Sorghum	Triticale	Unspecified	TOTAL
Sub-Saharan Africa										
Botswana				4			31		1	36
Burkina Faso				19			27			47
Cameroon				1			13			14
Chad				25			24		8	57
Eritrea	9			9			42		7	67
Ethiopia	7			3			12		18	41
Gambia				30			7		1	38
Guinea			10	7			1			17
Lesotho	1						11			12
Mali			1	29			22			52
Mauritania				3			46			49
Mozambique				2			9			10
Namibia				67			5			72
Niger				44			18			62
Nigeria				9			12			21
Senegal				34			6			40
Somalia							45			45
Sudan (former)				18			50			68
Togo				4			12			17
Zimbabwe				7			9			16
South Asia										
India				6			4			10
Middle East & North Africa										
Algeria	25				2					26
Iran (Islamic Republic of)	12									12
Iraq	25						1			26
Jordan	23						1			23
Libya	27			1						28
Morocco	28									28
Syrian Arab Republic	29									29
Tunisia	12									13

Table 3 continued

Country	Barley	Buckwheat	Fonio	Millet	Oats	Rye	Sorghum	Triticale	Unspecified	TOTAL
Yemen	4			11			41			55
Latin America & Caribbean										
Chile	2				8			2		11
El Salvador							13			13
Haiti							10			10
Mexico	2						11			13
Uruguay	6				1		2			10
Venezuela							12			12
Europe & Central Asia										
Armenia	24								2	27
Azerbaijan	19									19
Belarus	18	1			5	10		13		47
Kazakhstan	8				1				1	11
Kyrgyzstan	13									13
Latvia	15	1			9	6		2		33
Lithuania	18	2			4	4		8		37
Macedonia	13				1	1				15
Romania	6				3			1		10
Turkey	16					1				17
Ukraine	18	1			1	1				22

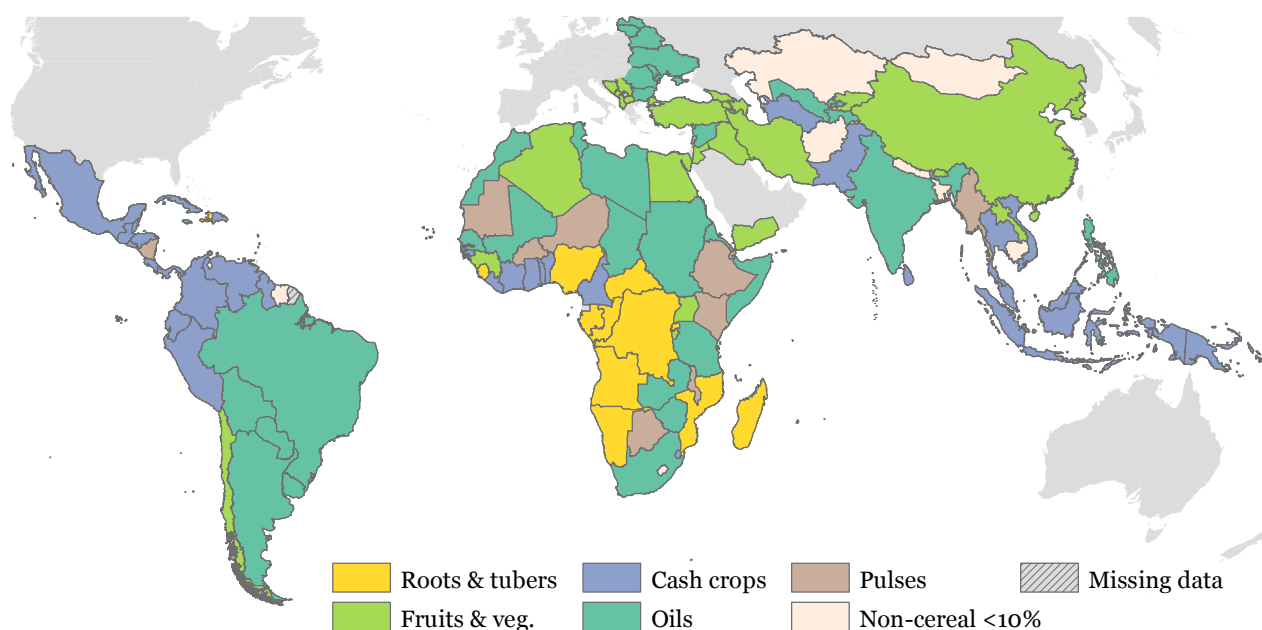
Source: FAOSTAT (2014)

Note: Figures are rounded to nearest percentage point. Values less than 0.5 percent not included.

3. Which non-cereal crops are most prominent in each country?

Figure 4 draws from the information in Table 1 to show the non-cereal crop category with the largest share of area harvested in 2010, subject to it accounting for at least 10 percent of area harvested. Noting again that cereals are varyingly prominent in each country, the map in Figure 4 represents a relative rather than absolute measure of other crop categories' prominence. In that context, the geographic patterns are less pronounced compared to the previous figures. Oil crops play a considerable role in many regions around the world. Roots and tubers are significant in many parts of Southern Africa. Fruits and vegetables are relatively prominent in only a small number of countries. Cash crops have a significant relative presence in Southeast Asia, parts of West Africa, and much of Central America and northern South America. Oil crops play a considerable role in many regions around the world. Roots and tubers are significant in many parts of Southern Africa. Fruits and vegetables are relatively prominent in only a small number of countries. Cash crops have a significant relative presence in Southeast Asia, parts of West Africa, and much of Central America and northern South America.

Figure 4: Largest non-cereal crop category
By share of area harvested in 2010



4. How prominent are “cash crops” in each country?

As consumers, people living in advanced economies are likely to think about directly consumed products like coffee, tea, and cocoa, when considering questions of developing country agriculture. However, these types of export-oriented cash crop products often comprise only a small share of developing countries’ agricultural systems. In many of the poorest countries, where agriculture accounts for the largest share of the labor force, most crops are staple foods and there is very little cash crop production at all. This is evident in Table 1 and Table 4, the latter showing the decomposition of area harvested to major cash crops in 2010. It is also apparent in Figure 5, which highlights the countries where all cash crops combined account for at least 15 percent of total area harvested.

The regional exception to the rule is Latin America and the Caribbean, where 20 of 29 developing countries have at least 15 percent of their agricultural area harvested to cash crops, including a significant amount of sugar, coffee, and cocoa. At the other end of the spectrum, only three countries in Europe and Central Asia are above the 15 percent threshold—cotton-producing Tajikistan, Turkmenistan, and Uzbekistan—while no countries in the Middle East and North Africa reach that level. The South Asia countries with the most significant cash crop concentration are Sri Lanka (22 percent, driven largely by tea and rubber), Pakistan (17 percent, largely cotton and sugar), and India (11 percent, again mainly by cotton and sugar). East Asia and the Pacific has a range of concentrated cash crop producers too, including Malaysia (83 percent, driven mostly by oil palm in addition to some rubber), Fiji (35 percent, mostly sugar), Indonesia (37 percent, including oil palm, rubber, cocoa, coffee, and tree nuts), and Papua New Guinea (35 percent, comprised of cocoa, oil palm, coffee, rubber, sugar, and tree nuts).

In sub-Saharan Africa, the small number of cash crop producers are mainly concentrated in coastal West Africa. Cote d’Ivoire and Ghana are the major cocoa exporters, Guinea-Bissau and Benin produce cashews, and Liberia is a significant rubber producer. More than 20 percent of Cameroon’s harvested area is comprised of various of cash crops, as is the case in Swaziland (mostly sugar) and in the island economies of Mauritius (sugar), Seychelles (cinnamon), and Sao Tome e Principe (largely cocoa).

Table 4: Share of area harvested by major cash crops, 2010 (3 year period average)

Country	Cocoa	Coffee	Oil Palm	Rubber	Cotton	Sugar	Tea	Tobacco	Tree nuts	Other	TOTAL
Sub-Saharan Africa											
Angola		1	1								2
Benin			1		6				16	1	24
Botswana											
Burkina Faso					6						7
Burundi		2	1				1				4
Cabo Verde						2					2
Cameroon	11	3	2	1	2	2			2		24
Central African Republic		1			2	1					5
Chad					4						4
Comoros		1								8	9
Congo	1	3	3	1		5					13
Côte d'Ivoire	30	5	3	2	2				13		57
Democratic Republic of the Congo		1	3	1	1	1					7
Eritrea											
Ethiopia		3			1					5	10
Gabon	2		2	6		2					11
Gambia			1								2
Ghana	25		5						2		33
Guinea	1	2	9		1						14
Guinea-Bissau			2		1				45		48
Kenya		3			1	1	3		1	1	10
Lesotho											
Liberia	8	1	3	13		5					30
Madagascar		4				3				4	12
Malawi					2	1	1	4			8
Mali					5						5
Mauritania											
Mauritius						86	1				87
Mozambique					3	1		1	2		7
Namibia											
Niger											
Nigeria	3		8	1	1				2		15
Rwanda		2					1				3
Sao Tome and Principe	39		4								43
Senegal					1				1		2
Seychelles							5			37	42

Table 4 continued

Country	Cocoa	Coffee	Oil Palm	Rubber	Cotton	Sugar	Tea	Tobacco	Tree nuts	Other	TOTAL
Sierra Leone	3	1	2						2		7
Somalia					2	1					3
South Africa						5					6
Sudan (former)					1	1					1
Swaziland					1	32					34
Tanzania		1			3			1	2	1	8
Togo	8	2	1		4						15
Uganda	1	4			1	1					7
Zambia					5	1		3			9
Zimbabwe					9	1		3		1	14
South Asia											
Afghanistan					1						2
Bangladesh						1			1	4	7
Bhutan									7	5	13
India					6	2			1	2	11
Maldives									10		10
Nepal						1				1	3
Pakistan					12	4					17
Sri Lanka				6		1	10		2	3	22
East Asia & Pacific											
American Samoa						1					1
Cambodia				1							2
China					3	1	1	1			6
Democratic People's Republic of Korea					1			2		1	4
Fiji						33				1	35
Indonesia	4	3	14	9		1		1	2	2	37
Kiribati									1		1
Lao People's Democratic Republic		4				1		1		1	7
Malaysia			65	17							83
Marshall Islands											
Micronesia (Federated States of)											
Mongolia									1		1
Myanmar				1	2	1				1	5
Papua New Guinea	14	5	12	1		1			1		35
Philippines		1		1		3				1	7
Samoa	5										6

Table 4 continued

Country	Cocoa	Coffee	Oil Palm	Rubber	Cotton	Sugar	Tea	Tobacco	Tree nuts	Other	TOTAL
Solomon Islands	13		13								26
Thailand			3	9		5				1	19
Timor-Leste	1	26									27
Tonga										2	2
Tuvalu											
Vanuatu	2										2
Viet Nam		4		3		2	1		3	1	14
Middle East & North Africa											
Algeria									1		1
Djibouti										3	3
Egypt					3	2				3	9
Iran (Islamic Republic of)					1				3	1	6
Iraq					1						1
Jordan								1			2
Lebanon								3	3		7
Libya									7		7
Morocco									2	1	3
Syrian Arab Republic					4				2	2	8
Tunisia									6	1	7
West Bank and Gaza									3		3
Yemen		3			2			1			6
Latin America & Caribbean											
Antigua and Barbuda					18						18
Argentina					1	1				1	3
Belize						29			1		30
Bolivia		1			4	5			1		11
Brazil	1	3			2	14		1	1	1	22
Chile									2	3	5
Colombia	2	20	4		1	9				1	38
Costa Rica	1	18	10			10					39
Cuba		2				26		1		1	29
Dominica	21	3				1				1	25
Dominican Republic	17	15	2			10		1	1		45
Ecuador	16	6	8			4				1	35
El Salvador		20				9			1	1	30
Grenada	11				2	2				11	25
Guatemala		12	3	3		11				3	32

Table 4 continued

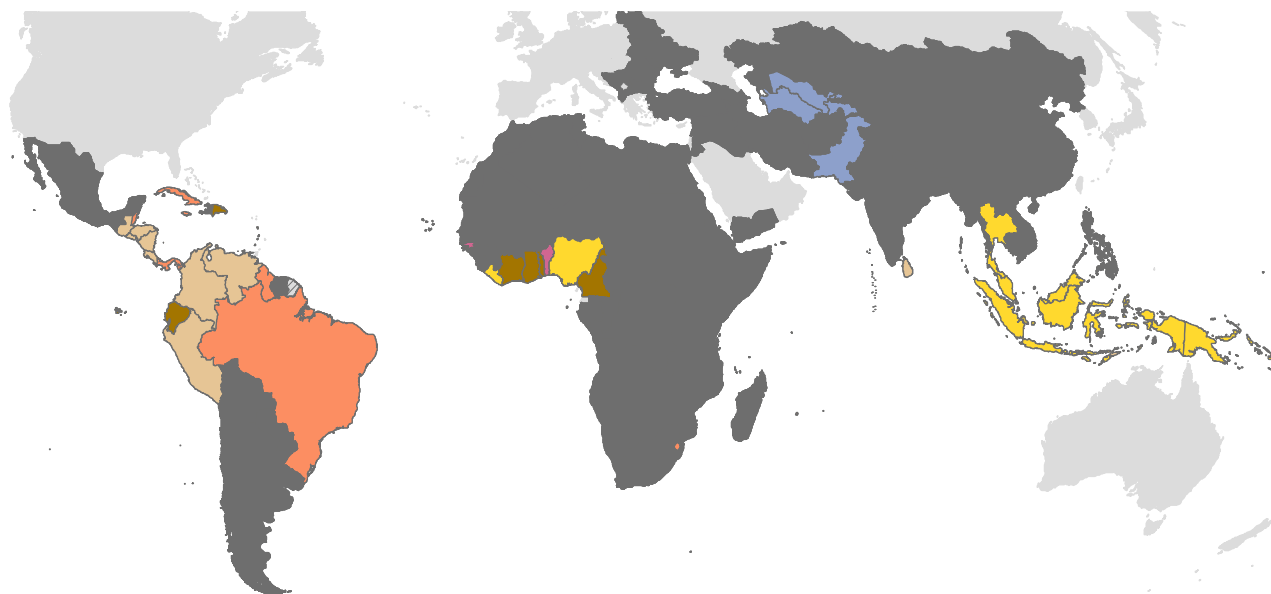
Country	Cocoa	Coffee	Oil Palm	Rubber	Cotton	Sugar	Tea	Tobacco	Tree nuts	Other	TOTAL
Guyana						21					22
Haiti	2	6				1				1	10
Honduras		22	9			6					39
Jamaica	2	8				17		1		1	29
Mexico	1	5			1	5			1	1	13
Nicaragua	1	11				5				1	19
Panama	1	9	2			10					24
Paraguay						2					3
Peru	2	11	1		1	2				1	19
Saint Lucia	1									5	6
Saint Vincent and the Grenadines	5	3				5				4	17
Suriname		1	1			5					7
Uruguay											
Venezuela	2	9	1		1	6					20
Europe & Central Asia											
Albania									2	1	4
Armenia									1	1	1
Azerbaijan					2				2		4
Belarus										4	5
Bosnia and Herzegovina									1	1	2
Bulgaria								1		2	3
Georgia							1		5	1	7
Kazakhstan					1						1
Kyrgyzstan					3				1	1	5
Latvia											
Lithuania										1	1
Macedonia								6	2		8
Montenegro									1		1
Republic of Moldova										1	2
Romania										1	1
Serbia										2	3
Tajikistan					17				1		18
Turkey					3				3	2	9
Turkmenistan					26					1	28
Ukraine										2	2
Uzbekistan					27						28

Source: FAOSTAT (2014)

Note: Figures are rounded to nearest percentage point. Values less than 0.5 percent not included.

Figure 5: Lead cash crop

In countries with cash crops accounting for at least 15% of area harvested in 2010



Oil palm or rubber
 Sugar
 Coffee or tea
 Cotton
 Cocoa
 Tree nuts
 Missing data

Note: Individual crops might not each account for 15% of area harvested. See Table 3 for details.

5. How has area harvested been changing recently?

The figures and tables above offer a snapshot of the composition of area harvested across developing countries, but they do not capture the underlying changes over time. As Deininger and colleagues (2011) have previously shown, agricultural land expansion presents major opportunities and challenges around many parts of the world. Table 5 presents both the absolute and percentage change in area harvested for each sample country between 2000 and 2010, ranked by the absolute change (still using three-year averages for both periods). Figure 6 maps the proportionate changes only.

Some of the information in Table 5 suggests extraordinary changes within only a decade. Brazil and India saw the two largest absolute expansions over the period, each growing by more than 16 million hectares. The next largest expansions took place in China (11.4 million hectares), Indonesia (8.2 million), Tanzania (6.1 million), Argentina (5.7 million), and Myanmar (5.0 million). Tanzania’s growth was particularly notable on a proportionate basis, representing an 82 percent change. But not all change took the form of expansion. Ten countries saw their estimated area harvested decline by at least 100,000 hectares: Belarus, Cuba, Georgia, Iraq, Mexico, Moldova, Nigeria, Romania, Turkey, and Uzbekistan.

Figure 6: Percent change in area harvested
2000 to 2010

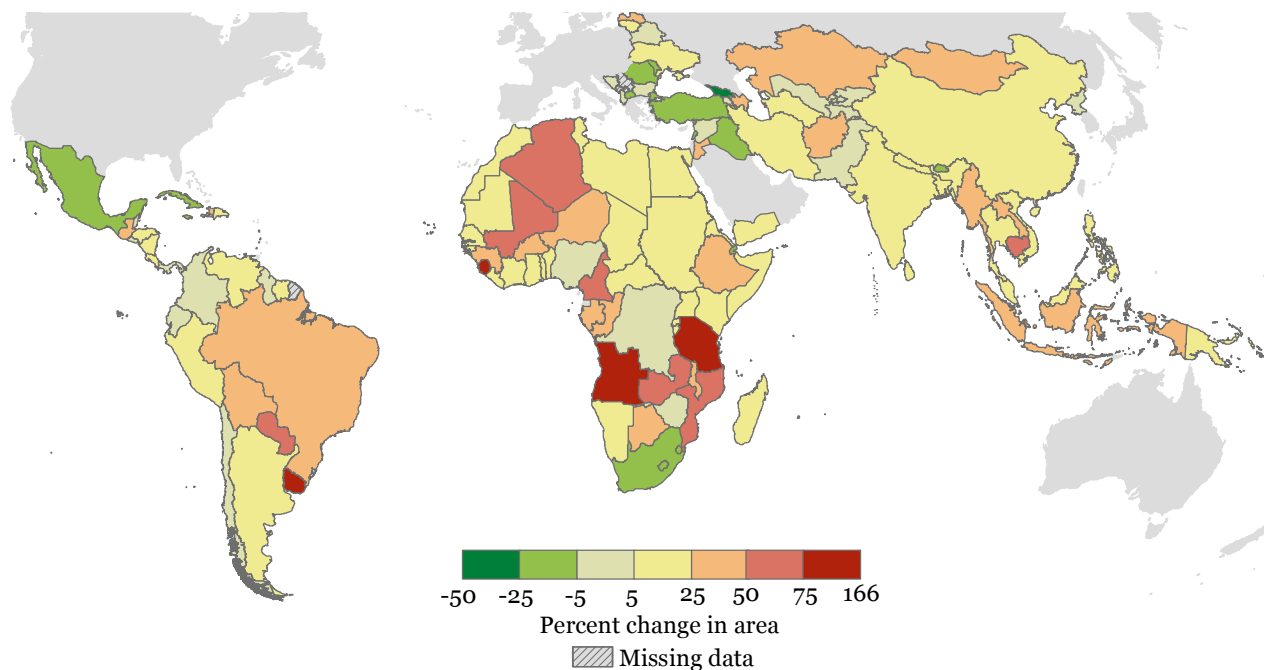


Table 6 shows the percentage point change for each major crop category between 2000 and 2010. It suggests that expansion in total area harvested is not necessarily linked to large changes in crop shares. However, 27 countries saw at least one crop category shift by at least 10 percentage points or more. In Cameroon and Mali, for example, the growth in cereals' share was driven by sorghum and maize, while in Bulgaria and Ukraine the growth in oils came from an increase in land for sunflowers. In Latin America, Argentina presents the most prominent example of a more general, regional shift from cereal production towards oils, driven by gains in soybean cultivation and a decline in wheat. This is consistent with previous evidence presented by Beddow and colleagues (2010), which highlights Latin America's shift away from cereals towards oils.

Table 5: Change in total area harvested, 2000 to 2010 (3 year period averages, hectares)

Country	Area Harvested 2000	Area Harvested 2010	Percent Change	Absolute Change
Sub-Saharan Africa				
Tanzania	7,438,327	13,557,300	82%	6,118,973
Niger	11,346,098	15,900,187	40%	4,554,089
Ethiopia	11,120,610	14,628,492	32%	3,507,882
Mozambique	4,121,221	7,106,372	72%	2,985,151
Angola	1,998,960	4,357,873	118%	2,358,913
Cameroon	3,713,324	5,956,170	60%	2,242,845
Mali	4,035,196	6,118,068	52%	2,082,873
Burkina Faso	4,534,090	6,524,364	44%	1,990,274
Ghana	5,274,281	6,527,416	24%	1,253,135
Côte d'Ivoire	6,326,005	7,527,420	19%	1,201,415
Sudan (former)	11,842,929	12,999,262	10%	1,156,333
Uganda	6,563,451	7,704,137	17%	1,140,686
Sierra Leone	584,284	1,532,787	162%	948,503
Malawi	2,998,342	3,863,484	29%	865,142
Zambia	1,371,448	2,208,280	61%	836,831
Guinea	2,521,436	3,332,599	32%	811,164
Kenya	4,431,267	5,186,982	17%	755,716
Madagascar	2,832,351	3,446,599	22%	614,248
Rwanda	1,557,767	1,858,151	19%	300,385
Benin	2,612,678	2,910,109	11%	297,431
Senegal	2,548,979	2,837,315	11%	288,336
Togo	1,571,824	1,772,491	13%	200,668
Chad	3,388,886	3,568,968	5%	180,082
Democratic Republic of the Congo	6,112,755	6,275,887	3%	163,132
Gambia	286,133	441,505	54%	155,371
Burundi	1,121,869	1,262,230	13%	140,361
Zimbabwe	3,182,190	3,309,368	4%	127,178
Somalia	731,097	831,385	14%	100,288
Congo	245,695	344,420	40%	98,725
Liberia	482,537	573,833	19%	91,296
Central African Republic	899,820	968,736	8%	68,916
Guinea-Bissau	436,066	488,209	12%	52,143
Gabon	201,662	253,684	26%	52,022
Botswana	158,312	206,430	30%	48,118
Mauritania	334,435	369,126	10%	34,691

Table 5 continued

Country	Area Harvested 2000	Area Harvested 2010	Percent Change	Absolute Change
Eritrea	573,282	604,653	5%	31,371
Namibia	357,600	379,831	6%	22,231
Comoros	100,608	106,889	6%	6,281
Sao Tome and Principe	47,291	47,356	0%	65
Seychelles	4,500	2,251	-50%	-2,249
Cabo Verde	70,527	65,262	-7%	-5,265
Mauritius	81,997	68,458	-17%	-13,539
Swaziland	193,041	161,108	-17%	-31,933
Lesotho	247,274	209,060	-15%	-38,214
Nigeria	41,718,528	40,748,544	-2%	-969,984
South Africa	6,706,859	5,240,428	-22%	-1,466,431
South Asia				
India	185,928,192	202,321,184	9%	16,392,992
Pakistan	22,975,346	24,023,124	5%	1,047,778
Bangladesh	14,389,018	15,375,516	7%	986,498
Afghanistan	2,748,877	3,463,122	26%	714,245
Nepal	4,503,497	4,898,354	9%	394,857
Sri Lanka	2,059,026	2,242,922	9%	183,896
Maldives	6,200	4,488	-28%	-1,712
Bhutan	130,588	111,969	-14%	-18,619
East Asia & Pacific				
China	164,319,744	175,692,848	7%	11,373,104
Indonesia	31,649,174	39,897,868	26%	8,248,694
Myanmar	13,324,216	18,393,804	38%	5,069,588
Thailand	18,088,878	20,564,964	14%	2,476,086
Viet Nam	12,137,207	13,568,825	12%	1,431,618
Cambodia	2,370,942	3,765,908	59%	1,394,965
Philippines	12,583,495	13,910,663	11%	1,327,168
Malaysia	5,709,551	6,414,386	12%	704,836
Lao People's Democratic Republic	1,012,880	1,418,176	40%	405,296
Papua New Guinea	909,804	1,069,172	18%	159,368
Democratic People's Republic of Korea	2,732,537	2,813,546	3%	81,009
Mongolia	237,318	301,948	27%	64,629
Solomon Islands	67,294	99,869	48%	32,575
Vanuatu	86,698	111,016	28%	24,318
Timor-Leste	186,227	206,769	11%	20,542

Table 5 continued

Country	Area Harvested 2000	Area Harvested 2010	Percent Change	Absolute Change
Samoa	38,020	44,526	17%	6,506
Kiribati	28,144	32,640	16%	4,496
Tonga	22,559	24,587	9%	2,028
American Samoa	4,401	5,879	34%	1,478
Tuvalu	1,712	1,912	12%	200
Marshall Islands	8,000	8,000	0%	0
Micronesia (Federated States of)	20,056	19,525	-3%	-531
Fiji	143,535	141,276	-2%	-2,259
Middle East & North Africa				
Iran (Islamic Republic of)	11,535,947	13,288,527	15%	1,752,580
Algeria	2,692,235	4,230,483	57%	1,538,247
Egypt	4,906,852	5,450,993	11%	544,142
Morocco	7,014,235	7,401,263	6%	387,029
Tunisia	3,266,163	3,581,814	10%	315,652
Yemen	968,618	1,133,205	17%	164,587
Libya	664,878	768,479	16%	103,601
Jordan	152,247	199,709	31%	47,461
Djibouti	14,009	11,100	-21%	-2,909
Syrian Arab Republic	4,790,066	4,782,667	-0%	-7,400
Lebanon	255,468	234,363	-8%	-21,104
West Bank and Gaza	172,449	114,107	-34%	-58,342
Iraq	3,479,195	2,787,349	-20%	-691,846
Latin America & Caribbean				
Brazil	51,362,488	67,390,856	31%	16,028,368
Argentina	26,128,618	31,779,294	22%	5,650,676
Paraguay	2,916,843	4,985,109	71%	2,068,266
Uruguay	695,144	1,827,386	163%	1,132,242
Bolivia	2,254,057	3,120,206	38%	866,149
Guatemala	1,608,937	2,161,488	34%	552,551
Peru	2,743,921	3,129,585	14%	385,664
Haiti	1,117,092	1,441,475	29%	324,383
Venezuela	1,803,683	2,015,477	12%	211,794
Honduras	955,935	1,154,524	21%	198,589
Nicaragua	889,273	1,032,531	16%	143,258
Colombia	3,817,878	3,885,885	2%	68,007
Costa Rica	500,753	563,385	13%	62,632
Dominican Republic	855,827	917,301	7%	61,474

Table 5 continued

Country	Area Harvested 2000	Area Harvested 2010	Percent Change	Absolute Change
Panama	303,035	311,312	3%	8,277
Suriname	59,247	65,466	10%	6,220
Belize	83,202	86,871	4%	3,668
Saint Vincent and the Grenadines	12,238	15,872	30%	3,634
Dominica	20,707	22,082	7%	1,375
Antigua and Barbuda	2,969	3,295	11%	326
Guyana	225,740	223,152	-1%	-2,588
Grenada	14,345	9,568	-33%	-4,778
Saint Lucia	14,578	9,744	-33%	-4,834
El Salvador	763,820	756,377	-1%	-7,443
Jamaica	170,323	159,129	-7%	-11,194
Ecuador	2,505,691	2,486,678	-1%	-19,013
Chile	1,219,258	1,188,089	-3%	-31,169
Cuba	2,173,860	1,774,242	-18%	-399,618
Mexico	16,449,907	15,178,168	-8%	-1,271,739
Europe & Central Asia				
Kazakhstan	13,168,859	18,061,680	37%	4,892,821
Ukraine	19,685,608	24,335,574	24%	4,649,966
Azerbaijan	1,096,200	1,428,779	30%	332,579
Turkmenistan	1,956,518	2,148,730	10%	192,212
Latvia	518,550	683,731	32%	165,180
Lithuania	1,302,041	1,435,968	10%	133,927
Bulgaria	2,919,328	3,005,392	3%	86,064
Bosnia and Herzegovina	591,560	612,761	4%	21,201
Armenia	268,235	270,133	1%	1,898
Albania	316,802	310,232	-2%	-6,570
Tajikistan	1,060,955	1,029,107	-3%	-31,848
Kyrgyzstan	974,137	940,858	-3%	-33,279
Macedonia	382,730	333,378	-13%	-49,352
Republic of Moldova	1,709,123	1,589,363	-7%	-119,761
Belarus	3,748,318	3,621,448	-3%	-126,870
Uzbekistan	5,069,564	4,879,597	-4%	-189,967
Georgia	651,914	367,118	-44%	-284,796
Romania	7,993,811	7,525,072	-6%	-468,739
Turkey	21,644,572	18,921,196	-13%	-2,723,376
Montenegro	N/A	45,002		
Serbia	N/A	2,982,281		

Source: FAOSTAT (2014)

Note: Figures are rounded to nearest percentage point. Values less than 0.5 percent not included.

Table 6: Percentage point change in share of area harvested by crop category, 2000 to 2010 (3 year period average)

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Sub-Saharan Africa						
Angola	-5	3	-3	6	1	-2
Benin	3	-5	1			2
Botswana	9		-3	-4	-1	
Burkina Faso	-6	2		4	-1	1
Burundi	1	1	-1	-3	3	
Cabo Verde	5			-7	1	1
Cameroon	10	-3	-1	2	-1	-7
Central African Republic	2		3			-4
Chad	10	-6				-5
Comoros	3	-1	1		-1	-3
Congo	3	-3	2	-1	-1	
Côte d'Ivoire	-1	-2	3		-3	2
Democratic Republic of the Congo	-1			1		
Eritrea	11	2	-4	-9	1	
Ethiopia	-3	2		-1	1	1
Gabon	2				1	-3
Gambia	15	-12	-1	-2		
Ghana	-1	1		1	-2	1
Guinea	10	-1	-1	-1	-4	-3
Guinea-Bissau	-4	3	1	1		
Kenya	4			-2		-1
Lesotho	-4		1	1	1	
Liberia	14	-1	-2		-3	-8
Madagascar	4	-1	1			-4
Malawi	-4	4	-2	2		
Mali	14	-6		-3		-5
Mauritania	-1	-1		4	-1	
Mauritius			1		2	-3
Mozambique	-6	-2	-4	12	1	-1
Namibia	-3	-1	2	1	2	
Niger	-5	3		2	1	
Nigeria	-4	2	2	-2		2
Rwanda	3	2	-1	-1	-3	
Sao Tome and Principe	1	3	2		3	-9
Senegal	1	-1			1	-1

Table 6 continued

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Seychelles		9			23	-32
Sierra Leone	-2	1	19	-4	-5	-8
Somalia	-3	1		1	1	
South Africa	-7	6			2	
Sudan (former)	8	-9		1	1	-1
Swaziland	2	-9	3		4	1
Tanzania	8	1	-3	-3	-2	-1
Togo	4	-5	1	3	-1	-1
Uganda		2	-1	2	-1	-2
Zambia	1	3	-4		-1	1
Zimbabwe	7	-5				-3
South Asia						
Afghanistan	1	-2		1		-1
Bangladesh	-1	-1	1	-2	3	
Bhutan	-10	-4	2	2	6	4
India	-6	1		2	2	1
Maldives		-39	-7	1	41	4
Nepal	-3		1		2	
Pakistan	2	-1			1	-2
Sri Lanka	7	-4			-1	-2
East Asia & Pacific						
American Samoa		-4	10		-5	
Cambodia	-5	1	6	1	-2	-1
China	-2	-1	-1	-1	4	1
Democratic People's Republic of Korea			-2	1	2	
Fiji	-2	3	8	2		-12
Indonesia	-5	-3	-1			10
Kiribati		-1	1			
Lao People's Democratic Republic	-3	1			1	1
Malaysia	-2	-1				3
Marshall Islands						
Micronesia (Federated States of)		3	-2		-1	
Mongolia	-3		1			
Myanmar	-6	3		3		
Papua New Guinea		-5				5

Table 6 continued

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Philippines	-2				2	
Samoa		3	-1		-2	-1
Solomon Islands		-3	-2			5
Thailand	1	-2		-1	-1	2
Timor-Leste	3	6	-4	1	1	-7
Tonga		2	-1			
Tuvalu		-1			1	
Vanuatu	-1	2				
Viet Nam	-5		1		1	3
Middle East & North Africa						
Algeria	2			-1	-1	
Djibouti				-8	7	1
Egypt	1	-3	1	-1	3	-1
Iran (Islamic Republic of)	7			-3	-1	-3
Iraq	2	-1		-3	2	-1
Jordan	16	-11		-1	-3	-1
Lebanon	1	2	1	-1		-3
Libya	-5	6	1	-1		-1
Morocco	-3	3			1	
Syrian Arab Republic	-2	2		-1	1	
Tunisia	-4	3				-1
West Bank and Gaza	2	2		-1	-3	-1
Yemen	5	-2		-1	-1	-1
Latin America & Caribbean						
Antigua and Barbuda		-2	2		2	-2
Argentina	-13	14				
Belize	10				-11	1
Bolivia	-4	5	-1	1	-3	2
Brazil	-6	8	-1	-2	-1	2
Chile	-1		-1	-1	5	-2
Colombia	-1				1	
Costa Rica	-1		3	-2	2	-2
Cuba	8		5	3	8	-23
Dominica		-5	5		-12	12
Dominican Republic	4	-1			2	-4
Ecuador	-3	-1			5	-2
El Salvador	-2	-1		3	2	-2
Grenada	2	2	3	3	13	-23

Table 6 continued

Country	Cereals	Oils	Roots & Tubers	Pulses	Fruits & Vegetables	Cash Crops
Guatemala		-2		3	3	-4
Guyana	1		-2			1
Haiti		-1	3		-4	2
Honduras	-6					6
Jamaica		4		-1	-4	
Mexico	-2			-2	2	2
Nicaragua	-2		1			
Panama	1		1	-1		-1
Paraguay	8	7	-5	-1	-1	-8
Peru	-2	-2	-1	1	1	2
Saint Lucia		4	3		-8	1
Saint Vincent and the Grenadines	-1	-2	4	-1	2	-2
Suriname	5	-1			-4	
Uruguay	-22	31	-1	-1	-6	
Venezuela	7	2	-1	1	-3	-7
Europe & Central Asia						
Albania	-8	2	-1	-2	9	
Armenia	-5		-1		5	1
Azerbaijan	13	-6				-7
Belarus	4	5	-7	-2		1
Bosnia and Herzegovina	-12		-2		15	
Bulgaria	-5	12	-1	-1	-5	
Georgia	-2	-3			5	
Kazakhstan	-4	5				-1
Kyrgyzstan	-1	-1	2	2	1	-3
Latvia	-3	14	-6		-3	-3
Lithuania	-1	11	-6		-2	-2
Macedonia	-6		1	3	2	1
Montenegro						
Republic of Moldova		8	-2	-1	-3	-3
Romania	-3	5			-1	
Serbia						
Tajikistan	6	-5	1	1	4	-6
Turkey	-1	2		-3	2	
Turkmenistan	1	-1	1		1	-2
Ukraine	-4	12	-2	-1	-2	-3
Uzbekistan	1	-2			2	-2

Source: FAOSTAT (2014)

Note: Figures are rounded to nearest percentage point. Values less than 0.5 percent not included.

Conclusion

Agriculture is too often presumed to be a “simple” sector. The data outlined in this paper underscore that the opposite is true. As an umbrella term, agriculture encompasses a vast array of species growing across a wide range of physical environments. The biophysical aspects of the sector are distinct by crop type and geography. Therefore, researchers and policymakers aiming to support international agricultural progress need to do so with a keen eye to understanding the underlying crop-specific complexities. This paper and its accompanying data tables aim to help inform that process.

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Appendix: Notes On Methodology

The data for this analysis draws from the FAO's online Crops Production dataset, using "area harvested" to individual crops and major crop aggregates. Due to limitations in available data, crops included here are those primarily for human use and consumption and do not account for area harvested for fodder crops or pasturelands. The 140 countries included in the sample are all developing economies, as classified by the World Bank in 2011. Most countries have area harvested data for multiple crop groups in each year and all countries have data for at least one major crop aggregate in 2009, 2010, or 2011. Sudan (former) is included in its pre-partition form, since South Sudan was not created until July 2011.

To create the variables presented in this paper, the FAO data are first transformed to create mutually exclusive, aggregate crop categories. Cash crops are defined here as generally export-oriented non-staple crops such as coffee, cotton, palm oil, sugar, spices, tea, tobacco, and tree nuts.³ Cash crops are then defined as a general category and subtracted from each non-cash crop category to avoid double-counting. This generates six aggregate crop categories: cereals, roots and tubers, pulses, fruits and vegetables, oil crops, and cash crops.

The total area harvested for each aggregate crop category in each country is estimated for both 2000 and 2010, using three-year averages to smooth for any annual swings; i.e., the respective averages across 1999, 2000, and 2001 and across 2009, 2010, and 2011. For both 2000 and 2010, each country's estimated area harvested for each crop category is then summed to calculate total area harvested and the corresponding shares for each category.

Tables 2 through 4 apply the same three-year averaging process to individual crops rather than aggregate crop categories. Figure 3 uses that calculation to identify the "predominant" cereal, which is defined as any individual cereal crop (e.g., maize, rice, wheat) with a harvest area accounting for at least 20 percent of the country's total area harvested. Some countries have two crops meeting that threshold and are presented accordingly in the figure. Countries without a single predominant cereal, such as China, have a large share of area generally harvested to cereals but no single crop crossing the 20 percent threshold.

Figure 5 first identifies countries with at least 15 percent of total area harvested to cash crops. The crop with the highest single share within that category is then highlighted using data from Table 3, although the highlighted crop might not individually meet the 15 percent threshold.

³ Specifically, the cash crop category includes the following items from the FAO database: agave fibres not elsewhere specified (nes); almonds, with shell; anise, badian, fennel, coriander; areca nuts; bastfibres, other; brazil nuts, with shell; cashew nuts, with shell; chestnut; chillies and peppers, dry; cinnamon (canella); cloves; cocoa, beans; coffee, green; coir; cotton lint; fibre crops nes; flax fibre and tow; ginger; gums, natural; hazelnuts, with shell; hemp tow waste; hops; jute; kola nuts; kapok fruit; kapok fibre; manila fibre (abaca); maté; nuts, nes; nutmeg, mace and cardamoms; oil, palm fruit; pepper (piper spp.); peppermint; pistachios; pyrethrum, dried; ramie; rubber, natural; seed cotton; sisal; spices, nes; sugar beet; sugar cane; sugar crops, nes; tea; tobacco, unmanufactured; vanilla; and walnuts, with shell.

