Box 2
Situation in the Colombian Agricultural Sector

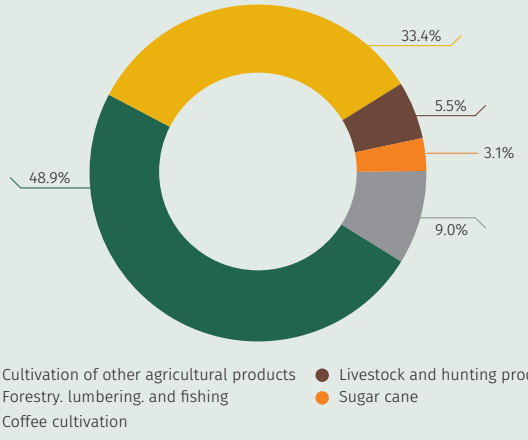
The agricultural sector accounted for 6.3% of the national gross domestic product (GDP) in 2017. The cycles of growth and contraction of the GDP for this sector are largely determined by the performance in the production of coffee, which contributes 9% of the total value of the agricultural aggregate. The production of sugarcane is 3.0% of that aggregate1[1] while the rest of the agricultural production provides 49% and has shown an average growth of 2.6% since the year 2000. The performance of the agricultural sector was outstanding in 2017 when it registered an annual increase of 8.1%. Livestock operations, in turn, contributed 33% to the total production of this sector. This sub-sector has grown at 2.5% on average since the year 2000 and in 2017, it grew at 4.1% (Graphs B2.1 and B2.2).

Agricultural subsector

The recent growth in agricultural production may be the result of increases in either the area cultivated or the crop productivity. Likewise, the way in which new volumes of production are traded on the domestic and international markets is a fundamental determiner of their profitability and the sustainability of their growth in the long term. The recent trends in both the acreage cultivated and the crop yields as well as the share that the agricultural production coming from different regions of the country has in the domestic and foreign markets is shown below.

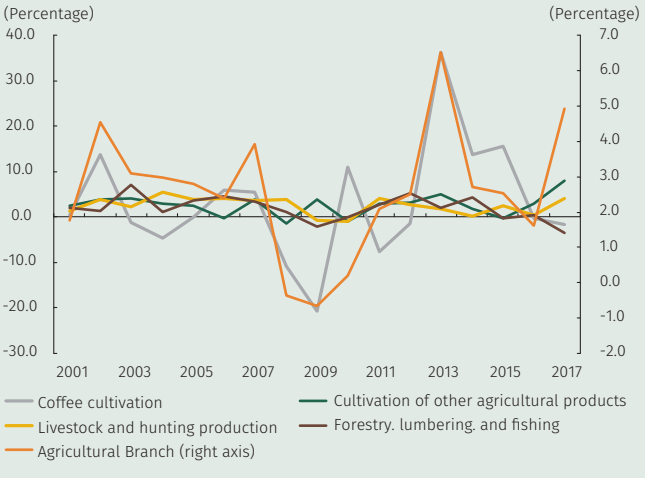
Of the total acreage of perennial crops planted in Colombia, 32.5% is concentrated in the Central region2[2] followed by 28.2% in the Eastern region, and 21.8% in the Pacific region. There has been a continuing increase in the acreage of perennial crops planted in every region of the country

Graph B2.1
Share held by Various Sub-branches in Agricultural Production, 2016[a/]



a/ Provisional values for 2016.
Source: DANE (balance between supply/use of products, classification to six digits), calculations by *Banco de la República.*

Graph B2.2
Annual Growth of the Real Agricultural GDP and its Components (seasonally adjusted)



Source: DANE, estimates by *Banco de la República.*

since 2015. The departments in the Atlantic and Eastern regions as well as other departments had the highest growth rates between 2015 and 2017. In the Atlantic region, this growth was driven by an expansion in the acreage of oil palm in 2016 and fruit trees in 2017. In the Eastern region, the increase in the acreage of plantains, sugar cane, and rubber, and in other departments, the acreages sown with oil palm (Casanare and Vichada) and cocoa (Arauca and Vichada) were significant (Table B2.1).3[3]

In terms of total acreage cultivated nationally, there was an expansion in the acreage of fruit trees and cocoa

1 Only includes the production of sugar cane. It does not include the production cost of refined sugar.

2 For the analysis that follows, the departments were classified into the following regions: Atlantic: Atlantico, Bolivar, Cesar, Cordoba, La Guajira, Magdalena, and Sucre. Eastern: Boyaca, Cundinamarca, Meta, Norte de Santander, and Santander. Central: Antioquia, Caldas, Caqueta, Huila, Quindio, Risaralda, and Tolima. Pacific: Cauca, Choco, Nariño, and Valle del Cauca. Other departments: Amazonas, Arauca, Casanare, Guainia, Guaviare, Putumayo, San Andres and Providencia, Vaupes and Vichada.

3 The analysis of acreage cultivated and production presented in this box uses the results of the municipal agricultural evaluations (EVA in Spanish) as a primary source. These collect information through the consensus of agricultural technical assistance units (Umata in Spanish), associations, and other important stakeholders in the municipalities.

planted which, in spite of having a relatively low share of the total area of perennial crops, showed high growth rates in all of the regions. In 2017 the acreage sown with these products grew 7.6%. This trend was mainly driven by the expansion of the acreages of avocado, pineapple, mango and passion flowers. The sustained growth of the acreage of avocado and pineapple plantings since 2010 was especially noteworthy.

The Atlantic and Eastern regions account for 52% of the acreage sown with annual crops in the country. As was the case with the perennial crops, the amount of area with annual crop plantings rose in every region and for most of the crops during 2017. The expansion of the acreage cultivated with grains other than rice and with vegetables, legumes, and tubers in all regions of the country was also significant (Table B2.2).

During the first and second half of 2015, there was a decrease in the number of fields with annual crops in the Atlantic region. It is possible that this trend reflects a pre-emptive response on the part of the farmers to the negative effects that El Niño has on crop yields. In 2016, the acreage planted in this region rebounded and reached levels higher than those registered in 2014. This was driven by a growth of 51.1% in the acreage of rice crops cultivated and of 21.1% in the area of vegetable, legume, and tuber plantings (Table B2.2).

The increases in the volume of production derived from the expansion of the acreage planted are reflected in the larger supply of annual crops in the main domestic markets4[4] and in the higher export levels of some agricultural products. The Eastern region was the one that contributed the most to the growth of the total volume in the provision of agricultural products between the first half of 2016 and the first half of 2017, with a growth of 22.1% and a 52% share in the total supply. In addition, tubers and plantains are the types of crops for which the supply increased the most in the wholesale markets between the first half of 2016 and the first half of 2017 with an annual growth of 25.3%. There was also a significant increase in the available supply of vegetables between May and September 2016. However, this trend was reversed during the last quarter of 2016 (Graph B2.3, panels A and B).

With regards to exports of agricultural products, there has been a sustained growth in the quantity and value of avocado and pineapple exports since 2015. As mentioned, these crops have been growing in terms of area cultivated since 2010. The positive performance of the exports of these crops is expected to continue to the extent that more hectares of those planted in prior years begin to produce and yield a harvest and the commercial links with buyers from the United States become strengthened.

The volume of coffee exports, for both the beans and processed coffee, has also presented a growing trend since 2012. However, there are no significant increases in their value as a result of the deterioration in the international prices for coffee beans. Likewise, there are no increases in the quantity and value of exports of products that belong to the banana, cotton, and flower production chains (Graph B2.4, panels A and B).

The competitiveness of Colombian agricultural exports on international markets depends, along with other factors, on their yields per hectare and per worker. An expansion in the cultivated area can generate increases in the yield per hectare if this is accompanied by technological improvements. Likewise, a drop in the yield per hectare could be registered if the additional land under cultivation is of lower quality than the one initially chosen for agricultural production. Finally, if the expansion of the acreage cultivated brings about changes in the yield of perennial crops, such changes take time to materialize due to the lag between planting and harvesting.

The data for Colombia reveal increases in the agricultural GDP per hectare harvested in the Central and Pacific regions with a growth of 20% between 2012 and 2016 (Graph B2.5). In a similar fashion, according to calculations provided by the World Bank, the value added per agricultural worker in Colombia rose 17% between 2012 and 2016, which has made it possible to close the existing productivity gap between Colombia and countries such as Brazil and Chile (Graph B2. 6).

These improvements in agricultural production per hectare and per worker are still understated if the lag that Colombia has with other countries in the region and developed countries is taken into account. Based on data from the Organization for Economic Cooperation and Development and the Food and Agriculture Organization of the United Nations (OECD/FAO),5[5] between 2007 and 2015, Colombia registered a lower yield per hectare for corn and tubers than that of other countries in the region, such as Brazil and Mexico, as well as that of any of the developed countries.6[6] Furthermore, between 2007 and 2012, there was a drop in the yield per hectare for rice crops in Colombia while in other countries such as Mexico and Brazil the yield increased. For 2016, the productivity per hectare

4 Among the wholesale markets, the following are included: Mercar (Armenia), Barranquillita and Granabastos (Barranquilla), Corabastos, Paloquemao, Las Flores and Samper Mendoza (Bogotá), Centroabasto (Bucaramanga), Cavasa and Saint Helena (Cali), Bazurto (Cartagena), the nueva sexta (Cúcuta), Centro de acopio (Ipiales), CMA, José María Villa Retail Plaza (Medellín), Surabastos (Medellín), Mercasa (Pereira), Complejo de servicios del sur (Tunja), CAV (Villavicencio).

5 OCDE-FAO: *Agricultural Outlook*, 2017-2026, available at http://stats.oecd.org/index.aspx?r=945134

6 This includes Canada, the United States, the countries of the EU-28, Norway, Switzerland, Russia, Ukraine, Australia, New Zealand, Israel, Japan, Kazakhstan, and South Africa.

Table B2.1
Share and Growth of Acreage Planted with Perennial Crops by Group of Crops and Region
(percentage)

Region	Group of crops	Share, 2017	Growth[a/] (annual change)		
			2015	2016	2017
Atlantic	Total	11.6	0.9	7.1	4.3
	Oil palm	5.6	2.6	11.0	2.4
	Cacao		3.7	2.4	5.1
	Coffee	1.7	-4.8	0.5	0.5
	Fruit[b/]	1.8	3.8	2.9	7.9
	Other perennials[c/]	1.9	-1.5	8.1	10.0
Eastern	Total	28.2	5.5	5.1	4.4
	Oil palm	10.5	11.4	2.0	3.7
	Cacao	2.7	2.2	6.2	6.2
	Coffee	3.7	-0.3	-1.4	0.5
	Fruit[b/]	4.4	10.4	9.8	6.8
	Other perennials[c/]	6.9	-1.3	11.2	5.4
Central	Total	32.5	0.8	0.5	2.8
	Oil palm	0.1	8.7	-0.9	-0.1
	Cacao	1.6	3.3	5.4	8.4
	Coffee	16.0	-0.9	-1.6	0.5
	Fruit[b/]	5.3	6.3	5.6	7.6
	Other perennials[c/]	9.5	0.6	0.7	3.1
Pacific	Total	21.8	0.8	3.5	3.6
	Oil palm	0.7	5.8	8.9	14.9
	Cacao	1.0	10.4	-4.8	10.9
	Coffee	5.8	0.3	0.8	0.5
	Fruit[b/]	2.5	0.9	9.9	6.1
	Other perennials[c/]	11.9	0.0	4.1	3.5
Other departments[d/]	Total	5.9	5.0	12.7	5.8
	Oil palm	2.6	2.3	13.7	-0.1
	Cacao	0.9	12.2	34.3	7.3
	Coffee	0.1	-1.5	-4.8	0.5
	Fruit[b/]	0.4	19.3	11.6	28.6
	Other perennials[c/]	1.8	4.7	4.3	10.0

a/ The values represent the growth of the total acreage planted in a year compared the previous year.
b/ Includes the following crops: agraz, avocado, aguaje, carob, anon, cranberry, araza (strawberry guava), acai berry, bacuri, badea, baby banana, banana, borojo, breba, deciduous trees, caimo, chamba, custard apple, cholupa, chontaduro, plum, citrus fruit, coconut, cocona, copoazu, corozo, banana, passionfruit, date, peach, pineapple guava, raspberry, strawberry, granadilla, guama, soursop, guava, gulupa, fig, lime, lemon, lulo, macadamia, mamey, mamoncillo (Spanish lime), tangerine, mango, mangosteen, apple, passion fruit, cashew, blackberry, orange, medlar, noni, papaya, papayuela, pepa de pan, pear, pineapple, pitahaya (dragon fruit), rose apple, pummelo, rambutan, tamarind, tangelo, tree tomato, grapefruit, cape gooseberry, umari, grape, caimarona grape, sapodilla. c/ Plantain, sugar cane, honey cane, sisal, mulberry, green botan, caña flecha, mushroom, esparto grass, castorbean, iraca plam, jatropha, wicker, orellana, sacha inchi.
d/ Corresponds to Amazonas, Arauca, Casanare, Guainia, Guaviare, Putumayo, San Andres and Providencia, Vaupes and Vichada.
Source: Ministry of Agriculture and Rural Development (EVA), calculations by *Banco de la República*.

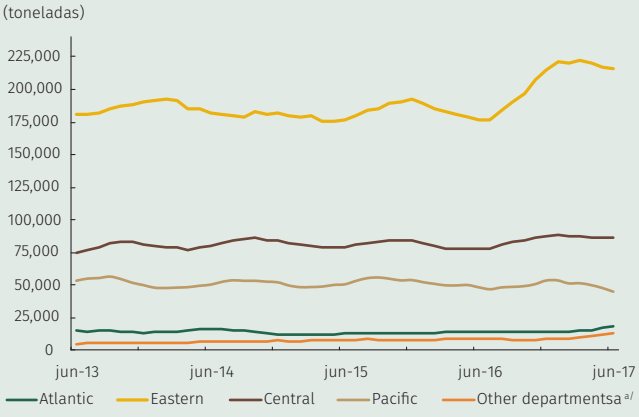
Table B2.2
Share and Growth of Acreage Planted with Annual Crops by Group of Crops
(percentage)

Region	Group of crops	Share, 2017	Growth[a/] (Annual Change)				
			2015		2016		2017
			1st six months	2nd six months	1st six months	2nd six months	1st six months
Atlantic	Total	25.0	-9.0	-10.9	17.6	12.1	13.6
	Rice	8.0	-3.1	10.3	51.1	20.3	-1.5
	Other grains[b/]	14.0	-10.6	-19.3	3.5	17.3	17.8
	Vegetables, legumes, and tubers[c/]	2.0	-10.0	1.0	21.1	30.0	48.9
	Other annual crops[d/]	1.0	-18.3	-8.8	2.4	-40.0	37.3
Eastern	Total	27.0	9.5	6.2	19.5	19.1	9.0
	Rice	8.0	38.6	55.9	27.8	16.2	8.0
	Other grains[b/]	7.0	10.1	2.8	42.3	29.7	5.5
	Vegetables, legumes, and tubers[c/]	12.0	-1.4	-2.3	5.1	15.9	12.5
	Other annual crops[d/]	1.0	-10.6	99.7	-0.1	8.4	-0.3
Central	Total	19.0	-0.1	-2.5	5.3	8.2	1.3
	Rice	8.0	14.7	6.1	5.3	8.3	0.9
	Other grains[b/]	6.0	-8.2	-8.1	12.4	4.7	3.2
	Vegetables, legumes, and tubers[c/]	4.0	-7.0	-8.2	2.5	13.5	0.8
	Other annual crops[d/]	0.0	-17.0	7.1	-35.5	-6.5	-12.7
Pacific	Total	10.0	20.6	15.4	0.7	2.5	12.1
	Rice	2.0	33.4	47.1	1.6	-4.3	2.4
	Other grains[b/]	4.0	13.0	4.1	3.0	7.7	12.6
	Vegetables, legumes, and tubers[c/]	5.0	23.8	14.1	-1.8	1.9	15.1
	Other annual crops[d/]	0.0	-29.0	26.3	32.0	2.2	10.9
Other departments[e/]	Total	19.0	37.2	56.6	22.4	-9.9	16.3
	Rice	15.0	35.5	18.7	27.8	-3.8	11.3
	Other grains[b/]	3.0	33.1	79.3	7.2	-4.6	48.0
	Vegetables, legumes, and tubers[c/]	1.0	86.3	159.0	-14.4	-39.6	11.0
	Other annual crops[d/]	0.0	141.2	11.8	2.4	-40.0	56.6

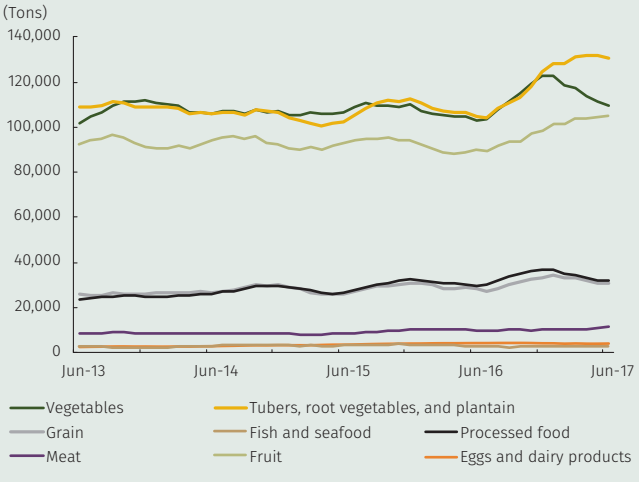
a/ The values represent the growth in the acreage cultivated during a six-month period compared to the same six-month period the previous year.
b/ Includes the following crops: Oats, barley, rye, corn, feed corn, millet, quinoa, sorghum, wheat.
c/ Acelga, squash, chili pepper, garlic, artichoke, celery, peas, eggplant, zucchini, pumpkin, onion, green onion, scallion, cilantro, collard greens, cauliflower, asparagus, spinach, kidney beans, chickpeas, guatila, broad beans, green beans, lettuce, lentils, peanuts, turnip, cucumber, bell pepper, leek, radish, beets, cabbage, soybeans, tomato, carrot, sweet potato, potato, ruba, olluco, and yota. d/ sesame seeds, and scouring sponge
e/ Corresponds to Amazonas, Arauca, Casanare, Guainia, Guaviare, Putumayo, San Andres and Providencia, Vaupes and Vichada.
Source: Ministry of Agriculture and Rural Development (EVA), calculations by *Banco de la República*.

Graph B2.3

A. Food Supply Volume by Region (6-month moving average)



B. Volume of Supply by Food Groups (6-month moving average)



a/ Corresponds to Amazonas, Arauca, Casanare, Guainía, Guaviare, Putumayo, San Andres and Providencia, Vaupes and Vichada.
Source: DANE and SIPSA, estimates by *Banco de la República*.

in Colombia for the three groups of products mentioned above may have been less than that of other countries in the region, such as Peru, Mexico and Brazil, and that of the developed countries. In addition, the value added per agricultural worker for all of the OECD countries between 2000 and 2016 is double that of the aggregate productivity per agricultural worker in the countries in the region. The values for Colombia only surpass those for Peru and Mexico (Graph B2.6).

The livestock sector

Livestock productivity has been contributing to the growth of the agricultural sector for seven consecutive years. In recent years, poultry and pork production, which grew 4.4% and 6.4% in 2016 and 12.4% and 2.6% in 2017 respectively, became significant. These positive results have compensated for the deterioration experienced in the area of cattle-raising since 2015 (Graph B2.7).

Based on information from Fedegan, the recent reduction in bovine production in our country has been the result of climatic shocks, the economic situation in Venezuela, and changes in the nutritional habits of consumers: Colombians' consumption of beef has decreased in favor of substitute proteins, such as eggs, chicken, and pork.[7] At the end of 2008, the total production of beef had exceeded the domestic consumption by about 10 million kilos, mainly due to trade with Venezuela. Around mid-2009, this gap was abruptly brought to a close as a result of the political crisis in the neighboring country. Only since 2013 has there been a renewed importance of foreign markets although the levels registered at the end of 2008 have not been reached again so far (Graph B2.8).

In terms of poultry, the growing trend in egg production in the Pacific and Eastern regions that took place in 2017 is noteworthy. The processing of chicken for market showed a relatively stable trend between 2014 and 2017, with an upward trend in the Eastern region (Graph B2.9, panels A and B).

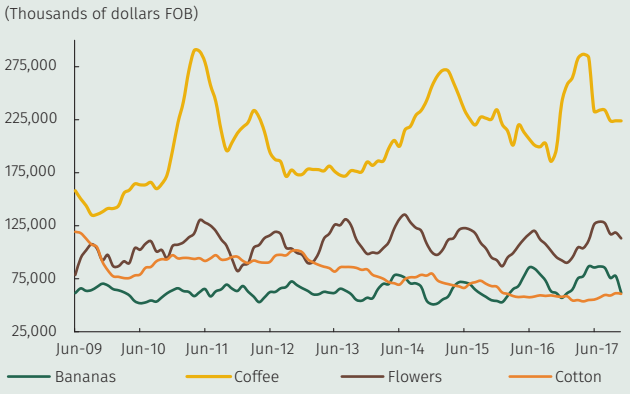
In conclusion, the agricultural and livestock business in the country has been positive in recent years. The areas where perennial and annual crops are cultivated have been growing. This trend has made it possible to increase the amount of the food supply in the main wholesale markets around the country as well as to expand the exports of non-traditional agricultural products. Also, there has been an increase in the production of eggs, chicken, and pork. Although increases have been registered in the agricultural GDP per hectare harvested in some areas of the country and in the value added per agricultural worker, these levels are still low when compared to those of other countries in the region. Policies to increase the productivity of both land and agricultural labor would make it possible to improve the competitiveness of Colombian agricultural products on international markets and enhance the potential improvements in social well-being derived from the recent expansion of the acreage cultivated.

7 See Fedegan (2017). *Document on Situation of Colombian,* consulted on 15 February 2018, at http://www.fedegan.org.co/estadisticas/documentos-de-estadistica

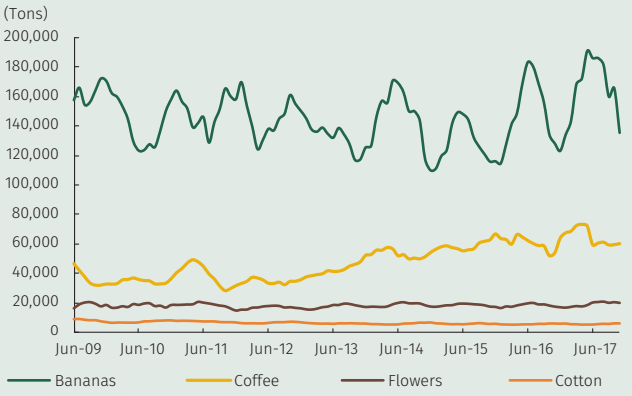
Graph B2.4

A. Main Exports Based on the Productive Chain.
(6-month moving average)

i. Value of productive chain exports[a/]

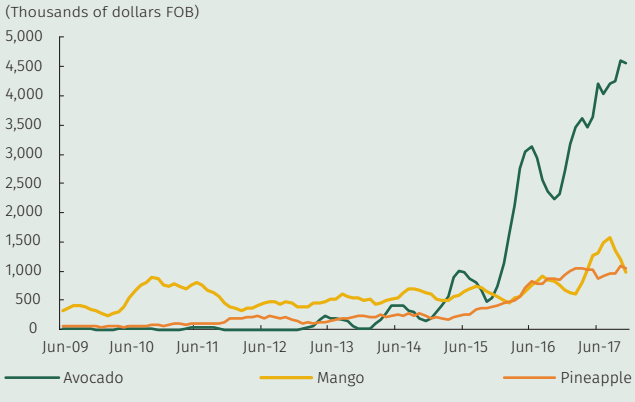


ii. Volume of productive chain exports[b/]

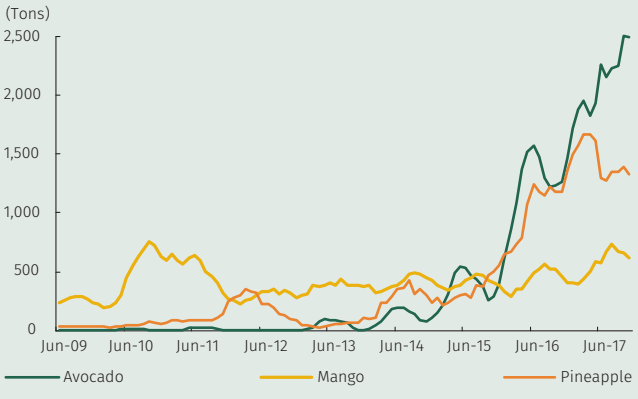


B. Other Exports Based on the Productive Chain a/
(6-month moving average)

i. Value of productive chain exports[a/]

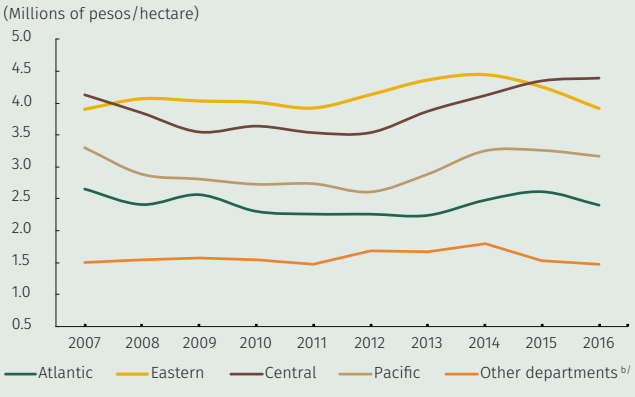


ii. Volume of productive chain exports[b/]



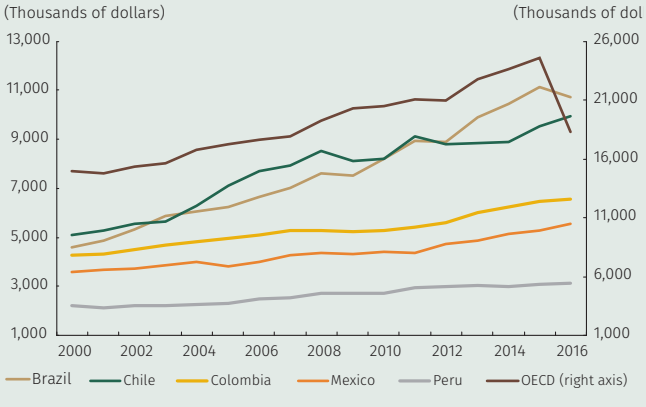
a/ Incluye el valor del producto crudo y procesado.
b/ Incluye volúmenes del producto crudo y procesado.
Sources: Ministerio de Agricultura y Desarrollo Rural y DANE (estadísticas de comercio exterior); cálculos del Banco de la República.

Graph B2.5
Agricultural GDP by Hectare Harvested Based on Region[a/]



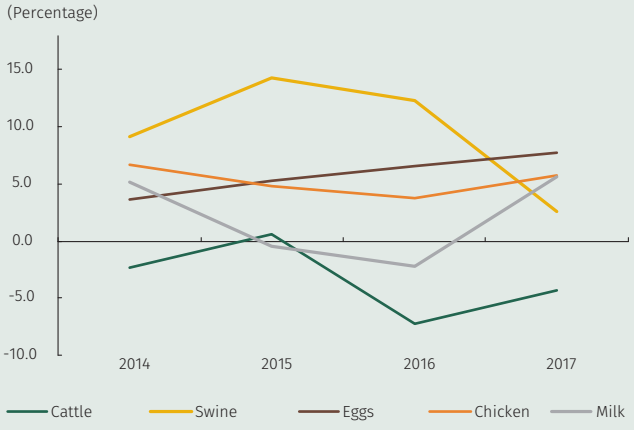
a/ Values at constant 2005 prices.
b/ Corresponds to Amazonas, Arauca, Casanare, Guainía, Guaviare, Putumayo, San Andres and Providencia, Vaupes and Vichada.
Sources: DANE (department accounts) and Ministry of Agriculture and Rural Development (EVA), calculations by *Banco de la República*.

Graph B2.6
Value Added per Agricultural Worker[a/]



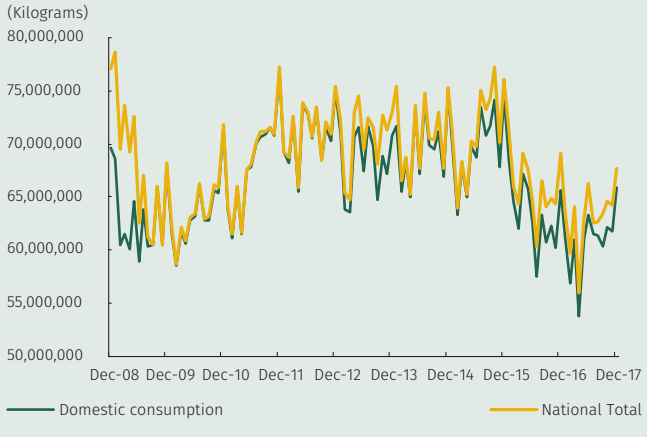
a/ Constant 2010 prices. The value for the OECD in 2016 is provisional and does not include the United States, Japan, Iceland, and New Zealand
Sources: World Bank, OECD, and the United Nations Agriculture and Food Organization.

Graph B2.7
Growth of Livestock Production by type[a/]



a/ The measurements of growth for cattle, swine, and chickens are the weight at processing while those measurements for eggs are units.
Sources: DANE (cattle and swine), Fenavi (eggs and chicken), and MADR (milk), calculations by *Banco de la República*.

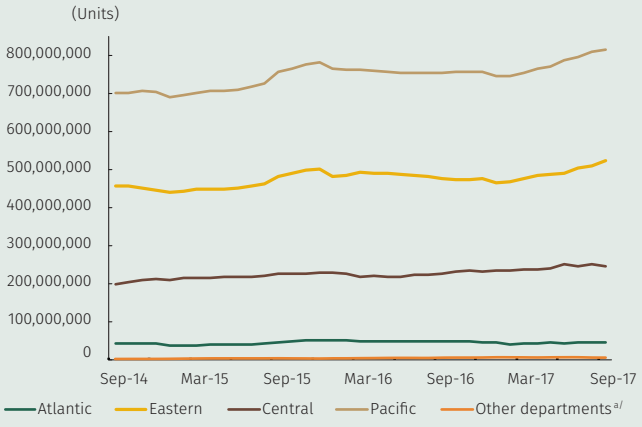
Graph B2.8
Weight of beef cattle at processing: national total and domestic consumption



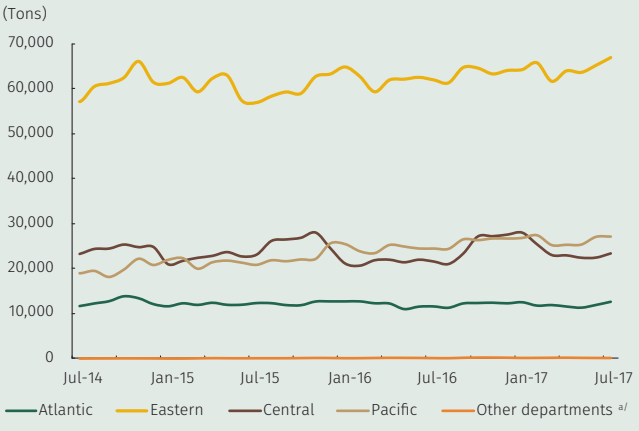
Source: DANE (survey of cattle slaughter), calculations by *Banco de la República*.

Graph B2.9

A. Egg Production by Region



B. Chicken Processing Production by Region



a/ Includes the following departments: Amazonas, Arauca, Casanare, Guainía, Guaviare, Putumayo, San Andres and Providencia, Vaupes and Vichada.
Source: Fenavi, calculations by *Banco de la República*.