

AGRICULTURAL PRODUCTION AND LAND PRODUCTIVITY IN CUBA

Mario A. González-Corzo

The agricultural reforms introduced since 2007 are one of the principal policy measures Cuba has pursued to “update” its centrally-planned economy. Among the most important reforms to transform the economically-important agricultural sector are: higher prices (paid by the state) for selected agricultural products; administrative and managerial reforms; decentralization in the distribution of selected agricultural products; the introduction of a new tax system; micro-loans (by state banks) for cooperatives, private farmers, and usufructuaries; and the expansion of usufruct farming rights (Gonzalez-Corzo, 2019; Mesa-Lago & Pérez-López, 2015; Mesa-Lago *et. al.*, 2018; Nova González & Figueroa Alfonso, 2018).

The implementation of these reforms has resulted in a new agricultural model in which non-state agricultural producers play a greater role, particularly in terms of employment and output (Mesa-Lago, *et. al.*, 2018; Nova González, 2018). Cuba’s agricultural reforms have also contributed to the redistribution of land management (but not ownership) from the state sector to the (more efficient) non-state sector, significant reductions in idle land, and the reorientation of production (González-Corzo, 2019; Mesa-Lago, *et. al.*, 2018; Nova González & Figueroa Alfonso, 2018; Spadoni, 2014).

Even though agricultural production and yields have fluctuated notably since the start of Cuba’s agricultural reforms in 2007, and have recovered in some

cases, they remain below 1989 levels for the majority of non-sugar crops. Insufficient agricultural output levels and historically-low yields have forced Cuba to import large quantities of food and agricultural products to meet the nutritional needs of its population, exacerbating the island’s historical dependency on the external sector (González-Corzo, 2019; Mesa-Lago, *et. al.*, 2018; Messina, Stefanou, & Royce, 2016; Nova González, 2018; Riera & Swinnen, 2016).

This paper analyzes recent trends in agricultural output and land productivity for a selected group of non-sugar crops since the introduction of agricultural reforms in Cuba in 2007.

AGRICULTURAL PRODUCTION

In addition to labor and capital, land is an important determinant of agricultural output and productivity (McMillan *et. al.*, 1989; Odhiambo, *et. al.*, 2004).¹ Economic theory suggests that increases in the quantity of inputs in the agricultural production process, combined with their improved utilization, generally contribute to higher output levels and higher productivity over time (Pingali, 2007).

However, in the case of Cuba, one of the most palpable effects of the agricultural reforms introduced since 2007 has been a notable reduction in the area planted and under production (i.e., the area or amount of the land input dedicated to agricultural production (González-Corzo, 2019). Between 2007

1. Capital (inputs) include equipment, machinery, fertilizer, pesticides, other chemicals, and seeds (McMillan, *et. al.*, 1989; Odhiambo, *et. al.*, 2004).

Table 1. Cuba: Non-sugar agricultural production, selected crops. Metric Tons (Mt)^a

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Roots and tubers	1,115.8	1,074.6	1,177.4	1,150.6	1,122.4	1,108.8	1,395.4	1,670.8	1,743.4	1,843.4	1,828.9
Potatoes	136.4	192.0	283.9	195.2	167.3	130.9	112.6	53.3	123.9	95.7	147.0
Plantains	805.2	599.8	489.9	549.3	644.4	708.4	658.5	836.1	890.2	1,016.1	1,014.9
Vegetables	1,690.7	1,528.4	1,697.3	1,492.2	1,504.3	1,444.1	1,665.9	2,499.2	2,424.2	2,384.8	2,483.7
Tomatoes	346.5	332.0	476.4	313.8	364.7	338.1	418.5	454.2	551.0	481.4	584.1
Rice	205.2	205.3	317.5	320.0	459.5	514.2	597.8	584.6	418.0	514.0	404.7
Beans	97.2	97.2	110.8	110.8	133.0	127.1	129.8	135.6	117.6	136.5	132.2
Citrus Fruits	503.1	435.2	370.3	309.2	264.5	203.7	166.9	96.8	115.4	119.5	98.8
Other Fruits	783.8	738.5	748.0	762.0	817.0	964.9	925.0	884.3	942.7	944.5	926.2
Corn	368.8	325.7	304.8	324.5	354.0	360.4	426.2	418.7	363.0	404.4	373.9

Source: ONEI, 2010, 2012, 2016, and 2018

a. Following a practice developed by Mesa-Lago (various publications), the figures in bold represent the peak year (in terms of physical output).

and 2017, the area planted and under production declined in 7 of the 10 non-sugar crops shown in Table 1. These were: potatoes (-30.8%), plantains (-14%), vegetables (-16%), rice (-17.4%), tobacco (-15%), citrus fruits (-70.7%), and other fruits (-19.8%).

Agricultural output increased in 9 of the 10 non-sugar crops shown in Table 1. Between 2007 and 2017, physical output of these crops increased as follows: roots and tubers (63.9%), potatoes (7.8%), plantains (26%), vegetables (46.9%), tomatoes (68.6%), rice (97.2%), beans (36%), other fruits (18.2%), and corn (1.4%). The exception was citrus fruits, which experienced an output decline of 80.4% between 2007 and 2017.

One possible explanation of the growth in agricultural output shown in Table 1 is the expansion of usufruct rights after the approval of Decree-Law 259 in 2008 and Decree-Law 300 in 2012. Since the start of the reforms (in 2008), an estimated 1.4 million hectares (ha) of idle state land has been distributed in usufruct and the country had close to 900,000 ha that could be distributed to usufruct farmers in the future (Nova González, 2018). In 2018, there were approximately 163,629 usufructuaries in Cuba, with natural persons (161,083) accounting for 98% of the total (Nova González, 2018).

LAND PRODUCTIVITY

Land productivity is an important measure of agricultural sector efficiency since land is the most permanent (and fixed) input or factor utilized in the agricultural production process (Dharmasiri, 2012). Land productivity can be improved over time

through the application of inputs such as agrochemicals, fertilizers, labor-intensive production methods, seeds, etc. (Dharmasiri, 2012). Other factors that can contribute to improved land productivity include: crop diversification, multi-cropping, and the use of ruminants (e.g., cattle, goats, and sheep) (Dharmasiri, 2012).

Table 2 presents agricultural yields (a measure of land productivity) for a selected group of non-sugar crops during the 2007–2017 period.

As Table 2 illustrates, agricultural yields declined shortly after the introduction of agricultural reforms in 2007–2008, but have gradually recovered, particularly after the expansion of usufruct farming with the approval of Decree-Law 300 in October 2012. It is worth noting that crop yields reached their peak levels in 2015 for 5 of the 10 non-sugar crops shown in Table 2; Furthermore by comparative and historical standards, crop yields remain relatively low for the majority of these crops even though in recent years imports of essential inputs such as fertilizer, fuel, equipment, and machinery has gradually increased.

CONCLUSIONS

Increasing agricultural output and improving agricultural productivity (or efficiency) are essential requirements for the growth and development of the Cuban economy.

The agricultural reforms implemented in Cuba since 2007 are part of the country's efforts to "update" its socialist economy. The reform policy measures have directly impacted agricultural output and land (or crop) productivity. While agricultural output and

Table 2. Cuba: Yields of selected crops other than sugarcane, Tons per hectare^a

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Roots and tubers	7.7	7.1	6.4	6.2	7.2	7.6	6.9	7.8	8.1	7.9	7.9
Potatoes	14.9	20.0	22.3	22.1	22.5	20.5	21.6	20.8	22.7	21.7	21.7
Plantains	10.1	9.1	6.3	6.2	8.8	10.9	9.6	11.8	11.1	11.5	11.5
Vegetables	16.5	9.4	9.1	9.1	10.4	10.4	11.2	12.4	13.2	12.8	12.8
Tomatoes	15.1	9.3	10.8	10.5	10.9	11.4	12.5	10.1	13.8	12.0	12.0
Rice	3.1	2.8	2.6	2.6	2.7	3.2	3.4	3.4	3.7	3.7	3.6
Beans	0.7	1.0	0.7	0.7	1.1	1.0	1.1	1.0	1.2	1.1	1.1
Citrus Fruits	11.8	8.6	8.7	8.0	7.9	7.8	8.2	5.0	8.3	7.4	6.9
Other Fruits	5.4	8.9	8.2	7.9	10.1	12.1	11.1	10.5	12.6	11.6	11.6
Corn	2.3	2.5	1.5	1.4	2.5	2.3	2.4	2.3	2.4	2.4	2.4

Source: ONEI, 2010, 2012, 2016, and 2018.

a. Following a practice developed by Mesa-Lago (various publications), the figures in bold represent the peak year (in terms of agricultural yield).

crop yields have recovered for the majority of the non-sugar crops included in this study (see Tables 1 and 2) agricultural production is unable to satisfy the nutritional needs of Cuba's population, and the island remains dependent on imported food and agricultural products to meet a significant share of domestic demand (Messina, Stefanou, & Royce, 2016; González-Corzo, 2019).

Domestic production satisfies close to 20% of Cuba's consumption of food and agricultural products, while imports account for the remaining 80%

(González-Corzo, 2019; Nova González, 2018). The value of imported food and agricultural products grew from \$1.7 billion in 2007 to \$2.1 billion in 2017, reaching 20.9% of imports in 2017 (ONEI, 2010, 2018).

This situation highlights the need to implement more profound structural reforms in Cuban agriculture (and in the Cuban economy overall) to address the island's insufficient agricultural production, high external sector dependency, and its precarious situation in terms of food security and sovereignty.

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