
Food Import Dependency in Cuba: Still the ‘Achilles’ Heel of the Revolution’?

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The ‘Special Period in Peacetime’ plunged Cuba into an austerity programme of great severity. The crisis forced agriculture to shift dramatically from a model based on trade dependency (sugar exports providing most of the foreign currency) to one prioritising food import substitution. This alternative brought about major transformations in the country’s agriculture. It revolutionised food production and decentralised land ownership. This article asks whether or not these changes reduced food dependency in Cuba. It provides an updated picture of Cuba’s food import dependency, with a particular emphasis on the increased role of small farmers in food production during the 2000s.

Keywords: Cuba, food import dependency, food production, land reform, small farming.

The Dangers of Food Dependency

In the wake of the global food crisis, the Cuban government shifted its focus to making the country self-sufficient in terms of food and safeguarding its sovereignty (Altieri and Funes-Monzote, 2012). As Raúl Castro announced on 26 July 2009, enhancing local production and reducing expensive food imports was a matter of national security (Machín Sosa et al., 2010). Cuba has generally been able to feed its people adequately: in 2007, on the eve of the global food crisis, Cubans received an average daily *per capita* dietary energy supply of over 3200 kcal per person – the highest figure for the whole of Latin America and the Caribbean nations (Food and Agriculture Organisation, FAO, 2011; Altieri and Funes-Monzote, 2012). However, as Rosset and Benjamin (1994: 4) observe, food import dependency had ‘shown itself to be the Achilles’ heel of the Revolution’. Until 1989, the special commercial arrangements that Cuba had obtained through the Council of Mutual Economic Assistance, the Soviet bloc trading system, had fuelled high levels of food imports that, in 1980, accounted for 70.7 percent of the (plentiful) food available (Deere, 1992; Nova, 1993; FAO, 1997; Álvarez, 2004). The Soviet collapse in 1990 had deprived Cuba of three-quarters of its foreign exchange inflows. At the worst point of the country’s food crisis in 1993, daily *per capita* consumption was only 1863 kcal per person, while protein and fat consumption decreased to 46 g and 26 g

respectively – both well below the recommended minimum daily requirements – once Cuba lost its highly favourable food importation terms (Canler, 2001; Ferriol, 1998; Granma, 29 September 2000; FAO, 2004, 2009; Granma, 29 September 2000). In this unprecedented context, Cuba was faced with a predicament: how to sustain its population without strategic food imports from the Soviet bloc trading system?

This situation forced the Cuban government to declare a ‘Special Period in Peacetime’ that put the country on a ‘wartime economy style austerity programme’ (Rosset and Benjamin, 1994: 21). The programme rationed food, fuel and electricity and gave priority to domestic food production, development of tourism, and biotechnology in order to open new spaces and reactivate Cuba’s economy (Castro, 1992; Fernández-Domínguez, 2005). De-monopolisation, deregulation and decentralisation policies were applied to improve the country’s desperate foreign exchange position, diversify the economy (especially agriculture) and attract investment into different economic sectors (Álvarez, 2004).

The crisis drove the island to shift to an alternative agricultural model that revolutionised food production patterns and decentralised land ownership and commerce based on small farming. In 1996, shortly after the food crisis, energy availability per person per day was 15.8 percent higher than in 1993. During the period 1995–1997, the contribution of fat to dietary energy balances increased by 19.6 percent, and in 1999, the recorded *per capita* availability of vegetables was the highest in 30 years – 2.2 times higher than the 1993 levels (ONE: National Bureau of Statistics, 2000; Rodríguez-Ojea et al., 2001). In keeping with these trends, food consumption (kcal/person/day) had increased from 2440 in 1995–1997 to 3280 in 2003–2005, by which time undernourishment in Cuba was affecting less than 5 percent of the population – well below the average levels in Latin America and the Caribbean (8 percent and 23 percent respectively) (FAO, 2009). These achievements were particularly noteworthy in view of the circumstances of the agricultural sector: annual production rates had grown from 3.5 percent in 1976–1985 but only 1.3 percent during 1986–1989 before stagnating in the early 1990s. At the same time, Cuba lost access to the food imports that it had previously received from the Soviet bloc. As Cuban officials pointed out in the mid-1990s, ‘though they said we were a satellite of the Soviets, our planet has disappeared and we are still here circling around’ (Rosset and Benjamin, 1994: 8).

After more than two decades of alternative strategies and small farming production, has Cuba managed to reduce its food import dependency? If so, how has it done it? This paper provides an updated evaluation of Cuba’s food import dependency, offering an original analysis of the links between that phenomenon and the more prominent role accorded to small farmers in food production since the early 2000s.

The paper is based on two periods of fieldwork in Cuba. The first, in June 2006, included semi-structured interviews in ten cooperatives in Havana province, Matanzas and Pinar del Río. The second, from September to late December 2008, investigated a wider range of farm cooperatives and institutions, 35 collective and individual small farms in the provinces of Havana city, Havana, Pinar del Río and Matanzas. These provinces were selected to represent alternative agriculture and twenty small farmers, 25 academics (working at different university research centres) and 30 researchers (at NGOs and other key research institutions such as the National Institute for Animal Sciences, National Association for Small Producers, Ministry of Agriculture and the Cuban Association for Agricultural and Forestry Technicians) were interviewed. These semi-structured interviews were later supplemented with information from discussions

of Cuban agriculture at academic conferences in Spain and elsewhere (CEISAL, 2016; FLACSO 2017) and the author's coordination in 2016 of a research seminar on food security with Cuban specialists at the University of Salamanca (Instituto de Iberoamérica). Comparing semi-structured interviews and secondary data with official statistics (research triangulation) provided a clearer understanding of the opportunities generated for small farmers in Cuba and their results.

To update the debate on small farming and dependency on food imports in Cuba from a political economy perspective, this paper assesses the evolution of food imports as a share of consumption between 1990 and 2013. The following section discusses how land reform has progressed over the years and describes the process of 'repeasantisation' that has taken place in Cuba. The article then considers the role of small farmers (individual landowners, farmers holding their land in usufruct and Credit and Service Cooperatives) in food production.

Food Import Dependency and Small Farmers in Cuba

An extensive empirical literature demonstrates that small farmers play a key role in feeding the national population in developing economies (e.g. Lele and Agarwal, 1989; Benneh, 1996; Greenland, 1997; Ahmed et al., 2004; Machethe, 2004; Altieri, 2008; Berdegué and Fuentealba, 2011; IFAD, 2011). The role of smallholders in staple production is particularly important (Conroy et al., 1996; Altieri, 2008). In the event of an external shock or adverse climatic conditions, locally produced foods avoid the high transport and marketing costs associated with imported crops (Holt-Gimenez, 2001, 2006).

From the 1980s to the late 1990s, approximately one-half of the food consumed in less developed economies was imported (FAO, 1994, 1997, 2004; Murphy, 1999). In the Caribbean, food insecurity was a direct consequence of both the small size of these countries and the centuries of colonialism, with priority being given to the production of sugar and other traditional export crops, while food crops for domestic consumption were neglected (Murphy, 1999). In Cuba, (sugar) export agriculture has long played a major role, while the island was traditionally a food import dependent developing country.

There is considerable debate concerning current food production and dependency in Cuba (e.g. Funes et al., 2002, 2009; Álvarez, 2004; Ross, 2004; Enríquez, 2010; Machín Sosa et al., 2010; Altieri and Funes-Monzote, 2012; Chan and Freyre Roach, 2012; Wilson, 2012; Nova, 2017, to name but a few). However, there is little dialogue between different bodies of literature exploring agriculture and (collective and individual) forms of food production. Magalys Calvo, former Vice Minister of Economy and Planning in Cuba, stressed in February 2007 that 84 percent of items 'in the basic food basket' at that time were imported, but this observation applies only to the food that is distributed through regulated government channels by means of a ration card. Overall, the available evidence suggests Cuba's food import dependency has been gradually falling for decades (Altieri and Funes-Monzote, 2012). Whereas the island imported approximately 70 percent of the food available for domestic consumption in the 1980s, the figure had fallen to 55 percent by the end of 2008, even though the island had been hit by three particularly destructive hurricanes that year.

Another area of the literature (e.g. Cruz and Sánchez 2005; Gold, 2011; Premat, 2012) focuses on food production strategies like Cuba’s urban agriculture: an outstanding mechanism to expand small farming production based on decentralised food markets and commercialisation strategies in Cuba’s non-capitalist context. The programme has become one of the best examples of food import substitution implemented on a national scale – an audacious shift of agricultural policy connected to small farmers and researchers involved in the field of transnational sustainable development in the changing context of post-Soviet Cuba (see Cruz and Sánchez, 2001, 2005; Premat, 2012). The history of urban gardens in Havana also shows the tension between the state and civil society, between old technocrats and new farmers and researchers involved in food production and import substitution (Gold, 2011; Wilson, 2012).

Additional evidence from Food and Agriculture Organisation data from 2017 on the quantity of food imports and the domestic food supply has contributed to my effort to advance debate on the relationship between small farmers and food dependency in Cuba from a political economy perspective. The import dependency ratios per food group are shown for two different periods: 1990 and 2013 (the latest period for which statistics are available). During this period, the island experienced decreasing proportions of imports for cereals, starchy roots, pulses, vegetable oils, vegetables, fruits, and animal fats – the basic products needed to sustain the Cuban diet. By contrast, during the same period, import ratios for other food groups increased. This was the case for sugar, meat, oil crops, offal and milk (Ross, 2004; FAO, 2009).

A particularly interesting example concerns milk. The revolutionary government embarked on an ambitious plan to modernise Cuban agriculture by developing large-scale capital-intensive industrial farms specialising in milk and livestock production. However, these sectors were badly affected by the Special Period. Import dependency ratios increased during the 1990s and early 2000s, until, in 2006,

Table 1. Ratio of Imported Food to Domestic Food Supply, Selected Food Groups

Food groups	1990 (%)	2013 ^a (%)
Cereals – excluding beer	85.9	70
Starchy roots	4.6	0.7
Sugar and sweeteners	0	0.5
Pulses (e.g. peas, beans and lentils)	87.7	0.5
Oil crops ^b	27	82.4
Vegetable oils ^c	100	64
Vegetables	2.6	0.5
Fruits - excluding wine	0.8	0.6
Meat	19.8	49.5
Offal	0	9.09
Animal fats (raw)	92.8	36.3
Milk - excluding butter	29.5	50.1
Eggs	0	1.7

^aLatest data available for Cuba. ^bFAO includes both annual (usually called oilseed) and perennial plants whose seeds, fruits or mesocarp and nuts are valued mainly for the edible or industrial oils extracted from them. ^cThe FAO concept includes raw, refined and fractioned oils, but not chemically modified oils. Ratios calculated as the percentage of FAO total food supply per aggregated group of products; the basis of the calculation the weight of food imports and domestic food supply.

Source: Author’s calculations from FAOSTAT, Food Balance Sheets for Cuba, 2017.

50 percent of milk consumed in Cuba was imported, owing to limited production, distribution problems and the poor quality of raw milk (Ponce, 2009). The application of a new payment system and incentives to increase the price of milk purchased by the government from peasants and cooperatives helped to increase production from this sector (Fornés, 2008). The growth in output was also linked to a new system of raw milk distribution in local free markets, designed to reduce imports of powdered milk (Ponce, 2009). In this context, from 2008 to 2013, the percentage of imported milk dropped slightly from 56 percent to 50.1 percent (author's calculations from FAO, 2017).

Cuba has, then, not enjoyed autonomy in its food system. Yet the end of strategic imports at highly subsidised prices from the Soviet bloc and the difficult circumstances of the Special Period forced Cuba to reframe its food security strategy, shifting from dependency to more autonomous food production schemes. The change in direction of agrarian policy, which involved a decisive shift towards small farming also supported by grassroots organisations and institutions, aimed to reduce Cuba's dependence on imports from the early 1990s, and more intensively under the Raúl Castro administration. In the early 2000s, imports of food groups such as cereals, vegetables, pulses and animal fats, which were key to meeting Cuban food requirements, dropped significantly.

It is remarkable that Cuba has been able to maintain an adequate level of food self-sufficiency (approximately 50 percent of domestic food was imported in 2012: Altieri and Funes-Monzote, 2012; see also Chan and Freyre Roach, 2012). It has done so despite being hard hit by adverse weather conditions, structural problems and an economic crisis. How can we explain this? As Altieri and Funes-Monzote (2012) argue, small farmers' contribution to agricultural production was a significant factor behind the decline in Cuba's import ratios. It therefore merits further consideration in the following sections. In an attempt to explain the relative stability of Cuban agriculture and food security, the same authors also stress the significance of complex and diversified cropping systems managed by small farmers, as structurally diverse farms maintain acceptable production levels even under stressful climatic and economic conditions. The engagement of small farmers in diversified food production and the process of land decentralisation explored in the following sections may provide further clues to the reduced dependence on imported food.

Emergent Forms of Land Ownership after the Special Period

To deal with the collapse of its trade relations with the Soviet bloc, the Cuban government (under Fidel Castro) reformed its agricultural policies, emphasising land decentralisation, internal liberalisation, food import substitution and sustainable, low-input small farming. Decentralisation of production and land management was based on Decree-Law No. 142 which, in 1993, established a new form of cooperative, the Basic Unit of Cooperative Production (BUCP), on former state-run farms. Decree-Law No. 142 also distributed *parcelas* (small plots of land) in usufruct to new small-scale farmers. At the same time, domestic market liberalisation opened up the agricultural sector to foreign investment (in joint ventures with the state).

These changes diversified Cuba's land tenure matrix in the early 1990s, giving rise to a diverse agricultural sector, based on ten different types of land organisations,

categorised as state, non-state and joint/mixed sectors (Figuroa Albelo, 1995, Martín, 2002; Álvarez, 2004; Figuroa Albelo et al., 2006). Whereas the state and mixed sectors were generally organised as large farms, the non-state sector was characterised by much smaller land holdings. The non-state sector comprised two types of production entities: collective production units (*Basic Units of Cooperative Production* and *Agriculture and Livestock Production Cooperatives*) and individual ones (*Credit and Service Cooperatives* and individual farmers; today this group also includes usufructuaries). Basic Units of Cooperative Production were essentially former state farms which were divided into smaller units by the Third Land Reform Law in 1993. Agriculture and Livestock Production Cooperatives were voluntary associations of traditional peasants who worked the land jointly and took management decisions democratically within the cooperative (ONE: National Bureau of Statistics, 1997; Martín, 2002; Nova, 2006). Individual producers include those affiliated to Credit and Service Cooperatives (CSC), usufructuaries (of small plots distributed in 1993, 2008 and 2012) and private property owners (approximately 99,500 small producers who obtained small plots from the state at the start of the Revolution) (Martín, 2002; Mesa-Lago et al., 2016; Nova, 2006). CSCs brought together former renters, sharecroppers, agrarian workers and small farmers. Their members engaged in cooperatives to gain access to services and credit, purchase inputs, and sell their produce, but production itself was still managed at individual level. Members of Credit and Service Cooperatives purchased inputs and sold products at fixed prices through state agencies, based on production plans and contracts established under the state distribution apparatus (*Acopio*). However, all small producers were able to sell any produce beyond the contracted quantity at free-market prices through farmers' markets (and sold more than 47 percent of their produce that way in 2016) (ONE, 1997; Martín, 2002, 2007; Álvarez, 2004; Mesa-Lago et al., 2016).

The most important land reform implemented in Cuba since the early 1990s was Decree-Law 259, promulgated by Raúl Castro in 2008. The new law distributed idle lands under long-term usufruct contracts (for ten years plus an extension of a further ten years if approved) to 'anyone who wants to produce' (especially individuals, cooperatives, small farmers and even some Basic Units of Cooperative Production) (Granma, 18 July 2008). Although, in 2008, 51 percent of agricultural land was lying idle, insufficiently exploited and covered by the invasive *marabou* (*Dichrostachys cinerea*, a deep-rooted, difficult-to-eradicate variety of acacia that cannot be used for any productive purpose), this decision aimed to revitalise the agricultural sector and food production in particular. Although these transfers were subject to a variety of conditions, the mass granting of idle state land in usufruct, mainly to small farmers and the landless, was a radical move, acknowledging the greater efficiency of small food production in the 'special' circumstances in which Cuba found itself and abandoning the long-held doctrine of the superiority of state or parastatal, large-scale, mechanised agriculture (Hagelberg, 2010). More than 170,000 peasants benefited from Decree-Law 259 (MINAGRI, 2011). Closely related to Decree-Law 259, the programme of suburban agriculture was created in 2010–2011 to enhance food production in a radius of 10 km around the capitals of provinces and municipalities and other small towns across the island and to connect rural producers to local markets. The extension of the programme to suburban areas where the majority of the island's small farmers are to be found, as well as 75 percent of the Cuban population, means it has a higher potential to reduce food import dependency than urban gardening alone would do (Rodríguez Nodals, 2008).

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Table 2. Cuba: Agrarian Structures 2007 and 2016

Sector	2007 (%)	2016 (%)
State	35.8	23.2
Non-state	64.2	76.8
Basic units of cooperative production	36.9	30.7
Agriculture and livestock production cooperatives	8.8	9.8
Small farming: credit and service cooperatives and usufructuaries ^a	18.5	36.3

^aIncluding the beneficiaries of Decree-Laws 259 and 300. Source: Based on Nova, 2013 and Oficina Nacional de Estadísticas e Información, ONEI: National Bureau of Statistics, 2016.

The ‘overhaul of the economic and social model’ approved by the Guidelines (*Lineamientos*) for the Economic and Social Policy of the Party and the Revolution in 2012 has offered a road to profound economic reform with both short- and long-term goals. Food import substitution, sustainable development and support for traditional food production have become key long-term goals within the new agenda (PCC, 2011, 2017). The most significant changes have occurred in agriculture. Of the 313 guidelines set out by the *Lineamientos*, 38 are devoted to agro-industrial policy, while 138 are directly or indirectly related to the sector (a more recent version of *Lineamientos* in 2017 included 29 guidelines directly related to agro-industrial development) (PCC, 2011, 2017). Following the *Lineamientos*, Decree-Law 259 was replaced by Decree-Law 300 in 2012, greatly increasing the volume of idle lands available for usufruct for free (see Table 2).

Decree-Law 300 aimed to increase the land available to cooperative members and workers in Credit and Service Cooperatives and Agriculture and Livestock Production Cooperatives. It also made credit and fiscal facilities available to increase individual small farmers’ engagement in domestic food production. By 2016, individual small farms constituted 36.3 percent of total agricultural land, more than any other type of landholding in Cuba (Nova, 2013; Oficina Nacional de Estadísticas e Información, ONEI: National Bureau of Statistics, 2016).

In sum, land reform in Cuba (though initially a temporary experiment) seems to have become a permanent project shared by the peasantry (grouped together in the *Asociación Nacional de Agricultores Pequeños* [ANAP – National Association of Small-Scale Farmers]) and the state, with a variety of laws used to redistribute land (mainly in usufruct) over the years. This process has evidently been accelerated by the need to reduce food import dependency during the Special Period. Since 2008, Raul Castro’s administration has clearly acknowledged the importance of small farming and import substitution, and the relation between the two phenomena (Machín Sosa et al., 2010).

What, however, has been the impact of land redistribution on domestic food production and small producers? The following section deals with small farming food production and diversification and discusses important changes that took place in the early 2000s.

Food Production, Diversification and Land Use: The Role of Small Farmers

Cuba's agriculture is split between two different sectors: products for export (sugar, tobacco and citrus) and food production for the domestic market. In terms of production patterns, organisation and distribution, sugar production is considered a different sector from other agriculture and is, in Cuba, a 'discipline' in its own right (as civil servants stated during interviews). Sugar production is managed by the Ministry of Sugar, while other agriculture (including tobacco and citrus) is managed by MINAGRI. This section focuses on other agriculture and food production for domestic consumption, mainly in smaller production units. A number of existing publications also stress the significant role of small farmers in national food production (e.g. Murphy, 1999; Cruz and Sánchez, 2001, 2003, 2005; Wright, 2005; Enríquez, 2010; Altieri and Funes-Monzote, 2012; Premat, 2012), but this article attempts here to bring the debate on small production up to date, taking account of the more recent data on food imports presented in previous sections.

The Contribution of Small Farmers to Domestic Food Supply: Enhancing Food Autonomy?

Until the early twentieth century, the *campesino* sector practised diversified agriculture and traditional mixed farming (Funes-Monzote, 2008). According to the agricultural census of 1946, up to 90 percent of land holdings in Cuba were diversified small/medium farms (between 5 ha and 75 ha). These small and medium units employed mixed crop/livestock patterns and obtained better productivity than large estates (CAN, 1951). Even before it became a national policy to prioritise agriculture with low imported inputs, in the 1990s small farmers had already demonstrated their importance: working only 20 percent of the total agricultural area (mainly small plots in the non-sugar sector, devoted to food crops) they produced more than 40 percent of domestic food (Rosset, 1996). During the Special Period, whilst large import-dependent and export-oriented state farms (particularly those producing sugar) were dramatically affected by the loss in inputs, funding and material resources, small farmers were at least able to fill part of the void, engaging in food production for national consumption (Funes-Monzote et al., 2002; Funes-Monzote, 2008). In 1997, smallholders were responsible for 70.7 percent of total domestic food sales (by weight) to the state (ONE: National Bureau of Statistics, 1997). In 2000, more than 50 percent of total agricultural direct sales to the state (again by weight) came from cooperative and small farmers (Credit and Service Cooperatives, Agriculture and Livestock Production Cooperatives and individual *campesinos*). For crops such as beans, corn and tobacco, the contributions from this sector accounted for 60 percent of sales to the state (Lugo-Fonte, 2000). Although these figures might be only approximate, they at least show the significant contributions small farmers made to total sales of food to the state for domestic consumption.

The diversified strategies that had been developed by small farmers before the 1990s were not the only factors placing them at the forefront of recovery from the food crisis of 1993. State policy, through the reopening of the free farmers' markets in 1994, coupled with land reform, also stimulated higher small-farming production levels and food availability relative to 1993–1994 levels (González, 2003). At the same time, the long

tradition and experience of research and extension systems and institutions was invaluable. Scholars specialising in Cuban agriculture reported during my interviews with them that the existence of solid grassroots organisations supporting small farmers (e.g. the National Association of Small-Scale Farmers, ANAP, the Cuban Association of Animal Production, ACPA, and the Cuban Association of Agricultural and Forestry Technicians, ACTAF, to name but a few) also helped to increase small farming engagement in food production (Altieri and Funes-Monzote, 2012; interviews with Xiomara Acosta, Humberto Ríos Labrada, 2006; Carlos Arteaga, 2008; Fernando Funes-Monzote, 2008; Peter Rosset, 2016).

Individual small farmers engaged extensively in national food production during the 1990s. Data on agrarian production released by ONE for 2008 showed that Credit and Service Cooperatives and individual peasant farmers alone produced 50 percent of the total national output of roots and vegetables, 64.1 percent of vegetables, and 74 percent of tropical fruits (by weight, in all cases). In the same year, their contribution to basic food production was particularly high for maize (82 percent) and beans (81 percent) (see Table 3) (ONE: National Bureau of Statistics, 2016).

Table 3. Small Farmers’ Contribution to Agricultural Production (Measured by Weight), 2008 and 2015

Crops	Small farming: CSC and usufructuaries 2008 (%)	Small farming: CSC and usufructuaries 2015 (%)
Roots and vegetables	50.0	74.6
Potatoes	6.1	6.3
Bananas	51.1	70.7
Vegetables	64.1	72.1
Tomatoes	68.0	83.6
Rice	36.0	64.1
Maize	82.0	86.1
Beans	81.0	79.6
Citrus fruit	15.0	29.5
Tropical fruits	74.0	81.2

Excluding sugar and urban production on ‘plots’ and ‘quads’ (the food production units typically used in urban areas).

Source: ONE: National Bureau of Statistics, 2009, Oficina Nacional de Estadísticas e Información, ONEI: National Bureau of Statistics, 2016.

In the case of vegetables, typically produced by peasants, production had dropped significantly from 1988 to 1994. Yet in 2007, when the amount of agricultural chemicals used was 72 percent less than in 1988, vegetable production surpassed 1988 levels. Similar patterns can be identified for other basic peasant crops, such as beans, roots and tubers (Altieri and Funes-Monzote, 2012). The more recent data on food production by small farmers also confirms these trends. In 2015, usufructuaries and Credit and Service Cooperatives alone produced 74.6 percent of roots and vegetables, 64.1 percent of rice, 86.1 percent of maize, 79.6 percent of beans and 81.2 percent of fruits (Oficina Nacional de Estadísticas e Información, ONEI: National Bureau of Statistics, 2016).

Reduced reliance on food imports can be better understood when seen in the context of small farmers' contributions to food production for domestic consumption of different types of food. Special attention should be paid to the products covering basic food needs, such as cereals, roots, pulses (peas, beans and lentils), vegetables and animal fats. These crops are mainly produced by small farmers. For cereals and pulses, decreasing import ratios were largely attributable to the contribution of small farmers (see Tables 1 and 3).

Livestock offers one of the best examples of the relative success of small farming in the mid-2000s (González, 2000). Production trends were inconsistent during the 1990s (Ministerio de Agricultura, MINAGRI, 2007), but in the early 2000s the evidence shows that small farmers made a significant contribution to total livestock production (except for buffalo) (ONE: National Bureau of Statistics, 2000). From 1995 to 2000, the number of livestock under individual management increased, as did the production of livestock products, while livestock production by the state and Basic Units of Cooperative Production showed no signs of recovery (González, 2000). By 2006, the small farming sector (with only 12.9 percent of grazing land) owned 43.5 percent of Cuba's livestock, with an average head of 7.3 per owner. This was significantly higher than the state enterprises (27.3 percent) and Agriculture and Livestock Production Cooperatives (4.8 percent) (Ministerio de Agricultura, 2007 (Table 4).

Table 4. Livestock Production in Cuba, Early 2000s

Type of production unit	Total land area (thousand ha)	Percentage of land area (%)	Owners	Head (thousand)	Percentage of national herd (%)	Head/owner
State enterprises ^a	1221.6	48.3	4569	1082.5	27.3	236.9
UBPC	780.1	30.8	2470	969.6	24.4	392.5
CPA	201.7	8.0	1063	191.8	4.8	180.5
CSC + individuals (small farmers)	325.8	12.9	236,088 ^b	1728.4	43.5	7.3
Total	2529.3	100%		3972.3	100%	

^aIncluding livestock and crop enterprises dedicated to livestock rearing (cattle, pigs, poultry and sheep).

^bIncluding individual owners or those in CSC and farmers with or without land.

Source: MINAGRI, 2007.

The latest available data on livestock production show that within the non-state sector, cooperatives and individual farmers obtained the highest levels of production, accounting for 23.9 percent of beef, 38.9 percent of pork, 66.5 percent of chicken or other poultry meat, 80.2 percent of lamb/mutton, 55.2 percent of milk and 14.1 percent of eggs. Production in the *campesino* sector was significantly higher than in the state sector for chicken, lamb/mutton and milk (see Oficina Nacional de Estadísticas e Información, ONEI: National Bureau of Statistics, 2016).

Diversification and Land Use Practices

Small farmers in Cuba do not concentrate all their energies on food production alone: they also engage in a diverse range of other agricultural activities. The dismantling of the sugar sector in Cuba in the early 1990s was a response to the crisis, but it nevertheless encouraged agricultural diversification. Leaving behind its historical

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dependence on sugar exports, Cuban farmers began to combine fruits and vegetables with other traditional crops, and livestock activities (mainly pig rearing) (Funes et al., 2002; Funes-Monzote, 2008) also came about due to the variety of alternative agriculture institutions and prevalence of low-input technologies and the revival of traditional small farming throughout the island (interviews with Xiomara Acosta, Armando Nova, 2008; Humberto Ríos Labrada, 2008; Fernando Funes Monzote, 2008). Rosset (1999) stressed that small farms’ total output per unit area (often involving more than a dozen crops and several animal products) can be higher as well as more diversified. Polycultures reduce losses due to weeds, insects and diseases (Francis, 1986; Denevan, 1995; Van Zyl et al., 1995; Van Schalkwyk and Van Zyl, 1996; Altieri, 2008). The yield advantages developed by small holders can range from 20 to 60 percent.

Turning to land use, Agriculture and Livestock Production Cooperatives were less able to adapt to difficult economic conditions during the crisis (Hagelberg and Alvarez, 2009; Pérez Cabrera, 2009, 2010). Although data on the intensity of cultivation are not disaggregated by crop, Agriculture and Livestock Production Cooperatives, Credit and Service Cooperatives and small farms used their land more intensively (cultivating higher proportions of their agricultural land using low-input and agro-ecological strategies) than state farms during the 1990s and early 2000s. The gap between individual small farms (Credit and Service Cooperatives, usufructuaries and private farmers) and Agriculture and Livestock Production Cooperatives widened in the late 1990s and early 2000s (see Table 5). These small farmers used their lands more intensively than the rest of the non-state sector.

Table 5. Land Use and Idle Land Ratios for Different Types of Agricultural Unit, 1989 and 2007. (Agricultural, Cultivated, Livestock and Idle Land. Sugar Production is Excluded.)

Concept	Land use index 1989 (cultivated area/ agricultural area × 100)	Land use index 2007	Idle land index 1989 (idle area/ agricultural area × 100)	Idle land index 2007 ^a
TOTAL	65.1%	45.1%	7%	18.6%
State	68.4%	29.2%	7%	26.5%
Non-State sector	n/a	54.0%	n/a	14.2%
Basic units of cooperative production	n/a	48.6%	n/a	19%
Agricultural production cooperatives	58.4%	52.1%	6.3%	12.5%
Credit and service Cooperatives, various <i>campesinos</i> and other private farmers.	53.6%	65.8%	7.6%	5.5%

^aCultivated land is defined in Cuba as the area planted, in preparation, resting or awaiting preparation for planting and including tracks, ditches and headlands less than six metres wide. Idle land is the area that could be cultivated but does not currently have any specific agricultural use. Agricultural land is the area devoted to agricultural production that includes cultivated and non-cultivated areas.

Source: Author’s calculations from Oficina Nacional de Estadísticas (ONE): National Bureau of Statistics, 2007; ONE: National Bureau of Statistics, 2007; Hagelberg and Alvarez, 2009.

During the period 1989–2007 (the only period for which the relevant data are available), small farms cultivated a higher proportion of their available land than any other type of production unit in Cuba, and left the lowest proportion of cultivable land idle (65.8 percent and 5.5 percent respectively) (Figueroa Albelo et al., 2006; ONE: National Bureau of Statistics, 2007).

The significant degree of diversification achieved by small farmers by mixing traditional and non-traditional crops with livestock production and the intensive use of land developed by Credit and Service Cooperatives and other individual small farms in Cuba contributed to increasing food production and therefore to reducing dependency on imports.

Conclusion

After the fall of the Soviet Union, Cuba found itself struggling to find its place in a new geopolitical environment. Given the lack of subsidised machinery and imported agricultural chemicals, agricultural policy promoted domestic food production by small farmers. Rosset and Benjamin (1994: 7) described Cuba as ‘an experiment that the world should be watching’. Alternative approaches to food production (involving more than 312,296 usufructuaries and 1.7 million hectares of land distributed to them from 2012 to 2014) have managed to increase sustainable food production for domestic consumption (Mesa-Lago et al., 2016). The unprecedented agricultural and food crisis, and the Cuban responses to it, might revive the academic and political economy debate, and trigger a reassessment of the food dependency challenges that many countries across the globe are likely to face in the future (Premat, 2012). Although Cuba still imports a great deal of food, only half the food consumed in the country was imported in the early 2000s. With the rising contribution of small farmers to total production, the island significantly reduced the import ratios of pulses, cereals and animal fats during the early 2000s (Chan and Freyre Roach, 2012).

Other fertile topics for debate include the options for the state and the market to encourage small farming and the ability of small farmers to engage in food production when socialism is being reconfigured in exporting countries like Cuba. In other words, what are the likely paths of food production under local markets in socialist mixed economies based on alternative practices/low-input developments and social capital (see Enríquez, 2010; Gold, 2011; Wilson, 2012)? To what extent can state and market forms of production subsist/coexist in the future and further reduce food dependence in Cuba? As stressed by usufructuaries interviewed by Mesa-Lago et al. (2016): if the state wants them to produce, they should provide ‘the ordinary man more of an opportunity to cultivate’ (Mesa-Lago et al., 2016: 16). Although land distribution in usufruct is arguably the key to Raul Castro’s agrarian reform to enhance food production, it is still only a modest step towards the market, towards private property and towards giving farmers the ability to decide what to produce and where their production can be sold (Nova, 2013; Mesa-Lago et al., 2016).

Without idealising the Cuban experience (as a replicable alternative to the market), the dichotomy between market (or individual) and collective (or state) forms of production and consumption at least reveals some areas in which small-scale farmers have been able to take advantage of the opportunity to produce food for domestic consumption. These spaces raise questions for future debate about the possibility of combining traditional (for domestic consumption) and (export-led) non-traditional forms of production

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or about the role played by different political economy actors and inclusive institutions within this process (e.g. the state, peasants, academia and grassroots organisations).

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