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Urban Agriculture and Economic Change in Cuba

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Cuba's urban agriculture (UA) model transitioned from a "crisis model", which emerged as a spontaneous, community-based, response the economic crisis of the "Special Period" in the early 1990s, to an alternative mode of locally-based, low-intensity, agricultural production primarily that is focused on partially meeting the population's nutritional needs. Recent economic transformations, the expansion of non-State sector, and improved diplomatic and commercial relations with the United States present a new scenario and potential growth opportunities for urban agriculture in Cuba. This paper analyzes Cuba's experience with urban agriculture since the early years of the economic crisis of the 1990s, and discusses its future prospects, as Cuba continues its gradual path towards economic decentralization and improved relations with the United States.

Keywords: *Cuban Agriculture, Transition Economies, Urban Agriculture*
JEL classifications: *P2, P3, P25, P32*

1 Introduction

The origins of urban agriculture in Cuba can be traced back the economic crisis resulting from the disappearance of the Council of Mutual Economic Assistance (CMEA) in 1989 and the disintegration of the Soviet Union in 1991. Before the crisis, Cuban agriculture was characterized by an externally-dependent production system that strongly focused on export crops grown on highly-concentrated land, with a disproportionate reliance on sugar (Rosset & Benjamin, 1994). Until 1989, Cuba's agricultural model was characterized by a "high degree of modernization, the dominance of export monocultures over food crops, and a heavy dependence on imported inputs and raw materials" (Rosset & Benjamin, 1994). This is shown by the relatively high import coefficients of selected agricultural products and the high levels of merchandise trade (i.e., exports and imports) with the Socialist Bloc at the onset of the "Special Period." In 1989, Cuba imported 100 % of its cereals, 90 % of its beans, and 49 % of its rice, 94 % its fertilizer, 98 % of its herbicides, and 97 % of its animal feedstock, mostly from the members of the socialist Council for Mutual Economic Assistance (CMEA) (Mesa-Lago, 1993; Rosset & Benjamin, 1994). An estimated 82.7 % of Cuba's merchandise exports were destined to CMEA countries (66.7 % to the USSR; 15 % to the rest), while the Socialist Bloc supplied 84.6 % of the Island's merchandise imports in 1989 (70.8 % came from the USSR, and 13.8 % from the rest) (Rosset & Benjamin, 1994).

Given the relatively high levels of external dependency of Cuban economy during the 1959–1989 period, it's highly-mechanized, and export-oriented agricultural sector suffered an unprecedented shock after the disintegration of the Socialist Camp in the early 1990s. Essential agricultural inputs declined significantly between 1989 and 1993 (the worst years of the "Special Period"), severely affecting production, forcing Cuba to realign its agricultural model, paving the way for the expansion of urban agriculture, particularly in the City of Havana.

Between 1989 and 1993, petroleum imports fell 53 %, from 13 million metric tons (Mt) to 6.1 million Mt; imported fertilizer declined 77 %, from 1.3 million Mt to 300,000 Mt; similarly, imports of pesticides decreased 62.5 %, and imported animal feedstock fell 70 %, from 1.6 million Mt to 475,000 Mt during the same period (Rosset & Benjamin, 1994). Sugar production, the country's principal agricultural export and source of hard currency during the 1959–1989 period, fell 47.5 %, from 8.0 million Mt in 1989 to 4.2 million Mt in 1993 (Jatar- Hausmann, 1999). Non-sugar agricultural production also fell notably as a result of the economic crisis of the 1990s. Between 1989 and 1993, citrus production declined 21.9 %, from 825,665 Mt to 644,446 Mt; tobacco production declined 52.2 %, from 41,606 Mt to 19,892 Mt; rice output decreased 59.8 %, from 563,381 Mt to 226,213 Mt; and production of vegetables fell 45.9 %, from 610,235 Mt to 329,883 Mt (Messina, et. al., 1997).

One of the responses to the crisis was the development of a new agricultural model based on changing consumption and

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production patterns, and on the promotion of urban agriculture (Rosset & Benjamin, 1994). Initially, urban agriculture emerged as a spontaneous response to the economic crisis, as ordinary Cubans, mainly in the City of Havana, resorted to growing fruits and vegetables and raising livestock (mostly chickens and pigs) in empty urban spaces, backyards, rooftops, and even inside their dwellings (FAO, 2013). Cuba's urban agriculture movement gained official recognition after the declaration of September 27, 1997 as "National Urban Agriculture Day," the approval of Decree-Law 208, and the creation of the National Urban Agriculture Program in 1998.

Despite the expansion of urban agriculture, and the introduction of gradual economic reforms since 2007, in recent years, Cuba's agricultural sector has been affected by declining output levels, low labor productivity, insufficient administrative coordination, excessive bureaucratic controls, and increasing de-capitalization caused by shortages of investment and foreign exchange receipts (Hagelberg, 2010; Spadoni, 2014). Cuban agriculture has also been impacted by adverse climatic conditions, particularly several devastating hurricanes, severe drought (2006–2008) and the economic effects of the U.S. trade embargo (González-Corzo, 2013; Mesa-Lago, 2012; Nova González, 2013; Spadoni, 2014). As a result, increasing agricultural production, while reducing food imports, has emerged as a key priority, and challenge for the Cuban economy (Hagelberg, 2010). In 2014, Cuba spent close to $1.9 billion on agricultural imports, representing 13.6 % of the country's total merchandise imports for that year (U.S Department of Agriculture [USDA], 2015). These tendencies underline the island's high levels of external sector dependency, and the pressing need to transform its vital agricultural sector.

This paper examines the origins, recent evolution, and future prospects for urban agriculture in Cuba since the onset of the "Special Period" in the early 1990s. The paper is organized as follows. Section two provides an overview of the importance of agriculture in the Cuban economy in terms of its contribution to national output, employment, and merchandise exports. To examine the importance of urban agriculture in the context of Cuba's recent efforts to restructure its economic model, section three discusses the principal policy measures implemented to transform Cuban agriculture since 2007, and the evolution of key agricultural indicators. Section four analyzes the origins of urban agriculture in Cuba, its guiding principles, the main type of productive entities engaged in urban agriculture, the types of crops produced, the policies and practices applied to support and promote urban agriculture, and its impact and spillover effects. Finally, section five examines the challenges and opportunities confronted by urban agriculture in Cuba, and its future prospects.

Table 1. Cuba: Gross Domestic Product (GDP) by Economic Activity, at Constant 1997 Prices, Milllion Pesos (CUP)

	2009	2010	2011	2012	2013	2014
Gross Domestic Product (GDP)	**46 353**	**47 461**	**48 791**	**50 262**	**51 643**	**52 184**
Agriculture	1 815	1 722	1 807	1 817	1 902	1 945
Fishing	79	60	52	55	58	59
Mining	278	298	303	309	302	300
Sugar industry	222	193	203	218	235	245
Manufacturing industries (excluding sugar industry)	6 195	6 294	6 540	6 673	6 798	6 534
Construction	2 864	2 651	2 458	2 734	2 951	2 883
Electricity and water	662	651	669	698	724	729
Transportation, warehousing, and communications	4 118	4 224	4 377	4 648	4 796	5 002
Commerce	8 374	8 537	9 004	9 485	9 837	10 158
Hotels and restaurants	2 385	2 559	2 790	2 932	3 001	3 094
Financial intermediation	1 244	1 251	1 266	1 272	1 287	1 339
Enterprise services, real estate activities	1 342	1 424	1 473	1 684	1 727	1 815
Public administration, national defense, social security	1 888	1 921	1 950	1 949	1 972	1 961
Science, innnovation, and technology	203	218	235	252	262	262
Education	3 731	3 899	3 692	3 552	3 475	3 370
Public health, and public assistance	7 984	8 432	8 721	8 756	8 917	9 095
Culture and sports	1 799	1 939	1 904	1 900	1 990	2 038
Other activities, communal services, personal associations	727	726	738	732	764	780
Import rigths	443	462	609	596	645	575

Source: Anuario Estadístico de Cuba (AEC), 2015

2 The Importance of Agriculture in the Cuban Economy

Agriculture is one of the principal sectors of the Cuban economy. While its direct share of the nation's gross domestic product (GDP) remains slightly below 4 % (Table 1), an estimated 20 % of the Cuban economy is directly and indirectly dependent on agriculture (Nova González, 2013). The domestic agricultural sector provides 40 % of the country's caloric intake, and 37 % of the protein consumed by the Cuban population (Nova González, 2013).

Despite several years of labor force restructuring, agriculture remains one of the principal sources of employment in Cuba. A total of 898,400 persons were employed in agriculture in 2015 and, even though the number of people employed in the agricultural sector declined by 2.5 % between 2010 and 2015, its share of total employment remained virtually unchanged at 18.5 % during this period. Furthermore, agriculture remains as the second most important source of employment in Cuba, after communal services, and its share of total employment exceeds the share of the fast-growing hospitality sector, which includes commerce, hotels, and restaurants. An overview of employment, by sector, is shown in Table 2.

On average agricultural workers are better remunerated than employees with similar skills in other sectors of the Cuban economy. In 2015, agricultural workers earned an average monthly salary of 834 Cuban pesos (CUP), which was 1.2 times higher than the national average monthly salary of 687 CUP (Table 3). Agricultural workers earned the second highest average monthly salary, after those employed in mining activities, of the nine (9) types of economic activities included in Table 3. Between 2010 and 2015, the average monthly salary for Cuban agricultural workers increased 72 %, compared to an increase of 53.3 % for the national average monthly salary during the same period (Table 3).

Table 2. Cuba: Employment by Economic Activitity

	Workers in Thousands					
	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Total	**4 984,5**	**5 010,1**	**4 902,2**	**4 918,8**	**4 969,8**	**4 860,5**
Agriculture	921,5	986,4	944,2	915,6	939,1	898,4
Mining	33,7	40,2	39,0	33,0	27,7	28,9
Manufacturing industries (excluding sugar industry)	486,6	507,9	608,5	469,2	462,0	461,2
Electricity, gas, and water	101,6	91,5	83,1	99,0	99,8	82,2
Construction	224,5	219,2	210,0	245,1	249,8	268,2
Commerce, hotels, and restaurants	641,9	647,3	683,3	740,7	755,6	770,4
Transportation, warehousing, and communications	304,5	310,1	286,3	305,6	319,4	306,1
Financial intermediation, enterprise services, real estate activities	116,2	125,2	103,1	102,2	102,2	96,8
Communal services, personal associations	2 154,0	2 082,3	1 944,7	2 008,4	2 014,2	1 948,3

Source: Anuario Estadístico de Cuba (AEC), 2015

Table 3. Cuba: Average Monthly Salary in State-Owned and Mixed Ententies by Economic Activity, Cuban Pesos (CUP)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Total	**448**	**455**	**466**	**471**	**584**	**687**
Agriculture	485	501	513	514	679	834
Mining	550	553	566	568	819	958
Manufacturing industries (excluding sugar industry)	433	455	466	468	589	804
Electricity, gas, and water	518	510	522	524	561	776
Construction	541	566	580	582	674	795
Commerce, hotels, and restaurants	366	367	376	391	566	657
Transportation, warehousing, and communications	437	449	460	465	575	668
Financial intermediation, enterprise services, real estate activities	429	422	432	435	612	830
Communal services, personal associations	425	415	425	438	500	504

Source: Anuario Estadístico de Cuba (AEC), 2015

Agriculture also plays an important role as a leading source of merchandise exports and foreign exchange receipts. Between 2009 and 2014, the value of Cuba's agricultural exports increased 66 %, from 305.9 million CUP to 507.8 million CUP (Table 4). This was primarily the result of notable world price increases for the principal commodities included in Cuba's agricultural exports. However, as shown in Table 4, agricultural exports remained virtually unchanged as a share of total merchandise exports during this period. In 2009, agricultural exports represented 10.7 % of total merchandise exports. This figure declined slightly to 10.5 % in 2014, despite their notable growth, in terms of value, during the 2009–2014 period (Table 4).

The moderate price reforms introduced since 2007 have increased the capacity of agricultural producers to obtain essential inputs to further increase production (Nova González, 2010). Moderate price increases have also contributed to reductions in the amount of agricultural output that was previously destined to the informal sector (or second economy). Even though these price increases have stimulated agricultural production, they have also resulted in several unintended consequences, such as reductions in deliveries of agricultural products to the food manufacturing industry, and the under-utilization of the country's industrial capacity (Nova González, 2010)

Table 4. Cuba: Merchandise Exports by Product Categories, Thousand Pesos (CUP)

	2009	2010	2011	2012	2013	2014
Total	**2 863 004**	**4 549 533**	**5 870 090**	**5 577 268**	**5 283 142**	**4 857 468**
Selected Product Categories:						
Agricultural products and livestock	305 925	355 851	482 568	570 329	549 367	507 848
Beverages and Tobacco	281 785	284 724	315 703	316 992	398 524	321 861
Raw materials (not edible), except fuels	877 182	1 206 917	1 479 788	1 082 279	795 655	827 653
Animal and vegetable oils, greases, waxs	14	106	353	729	188	55
Chemical products	554 139	538 407	582 706	620 141	680 960	678 679
Manufactured products	98 983	123 347	145 148	144 599	111 903	93 856
Machinery and transportation equipment	171 625	111 380	136 110	104 699	101 044	83 848
Various manufactured products	60 462	45 524	46 131	40 131	32 511	16 719

Source: Anuario Estadístico de Cuba (AEC), 2014

3 Agricultural Transformations: 2007 to the Present

3.1 Moderate price increases

Since 2007, Cuba has implemented a series of economic transformations to stimulate domestic agricultural output, and to reduce its growing dependency on food imports. The most important include: moderate price reforms for selected agricultural products, transfers of idle land to non-State producers (e.g. cooperatives and individual farmers), gradual decentralization economic decision making, and small loans to non-State agricultural producers. Starting in 2007, the State procurement agency, *Acopio*, increased the prices it paid producers of selected agricultural products such as meat, milk, potatoes, and rice. The price paid by *Acopio* to rice farmers increased from 1,931 Cuban pesos (CUP) per ton in 2007 to 6,304 CUP by the end of 2013 (Spadoni, 2014). The price paid to potato producers rose from 544 pesos per ton to 652 pesos per ton; and the prices paid to milk and beef producers increased from 900 pesos per ton to 5,218 pesos per ton, and from 2,450 pesos per ton to 8,900 pesos per ton, respectively, during the same period (Spadoni, 2014). Higher prices resulted in increased deliveries (or sales) to *Acopio*, and improved distribution to the State-operated retail store network, which offers essential food products at subsidized prices (Nova González, 2010).

Resolutions 237, 238, and 239, approved in 2015, resulted in additional moderate price increases for certain "fundamental" agricultural products to stimulate production, improve the quality of agricultural products, reduce retail and wholesale prices, and eventually diminish Cuba's dependency on imported food products (Gaceta Oficial de Cuba No. 18 Extraordinaria, 2015). After the approval of these reform measures, the prices paid by *Acopio* for potatoes (collected in the fields) increased from 45 to 65 pesos per *quintal* (qq); the price paid for tomatoes increased from 100 pesos / qq to 110 pesos / qq; the price of beef was raised from 6.50 pesos per kilogram (kg) to 12 pesos / kg; the price paid for pork increased from 9.70 pesos / kg to 26.60 pesos / kg; and the price of cow milk was raised from 2 pesos per liter (L) to 2.40 pesos / L (Gaceta Oficial de Cuba, 2015). The price modifications introduced though Resolutions 237, 238, and 239 (2015) include implicit profit margins ranging from 30 % to 60 % for agricultural producers, and provisions to prevent increases in retail prices (or the prices charged to consumers in agricultural markets) (Gaceta Oficial de Cuba, 2015).

3.2 Transfers of agricultural land in usufruct

The most important agricultural reform measure so far has been the transfer of idle State-owned land (in usufruct) to non-State producers after the approval of Decree-Law 259

in July 2008, and Decree-Law 300 in 2012. Under these usufruct contract arrangements, agricultural producers lease land from the State for a determined time period (10 years for natural persons and 25 years for productive entities), while the State retains ownership of the land, and producers are given somewhat greater levels of autonomy, after delivering previously-established production quotas to the State. Decree-Law 259 incorporates some elements that were not taken into consideration in previous efforts to transform Cuban agriculture, such as the duration of transfers to natural persons (10 years, renewable leases, regardless of the type of crop harvested), and the transfers of land to legal entities such as cooperatives (Nova González, 2010). Decree-Law 300 in 2012 expanded the transfer of idle State-owned lands to non-State producers (e.g., cooperatives and private farmers) in usufruct to 67.1 hectares (ha); it also allows individual agricultural producers operating under this new modality to become affiliated with cooperatives other than the Credit and Services Cooperatives (CCS). According to Decree-Law 300 (2012), private farmers can also associate themselves with Cooperatives of Agricultural Production (CPA) or Basic Units of Cooperative Production (UBPCs). They are also permitted to use alternative channels to procure essential inputs and distribute their output, once delivery quotas with the State have been fulfilled (González-Corzo, 2011).

3.3 Gradual decentralization

The gradual decentralization of commerce in selected agricultural products has been another important feature of Cuba's recent agricultural transformation, although this process appears to have been temporarily suspended after some of the measures introduced during the 7th Congress of the Communist Party Congress (PCC), celebrated in Havana in April 2016. The approval of Agreement 6853 (2010) authorized the sale of agricultural products in roadside kiosks (or "points of sale") operated by agricultural cooperatives or State enterprises. Producers or their representatives are allowed to sell their excess output at these kiosks, after their contractual quotas to the State have been delivered. These producers are required to pay a 5 % sales tax to the State (based on gross sales), and self-employed workers employed in these kiosks must contribute a preset percentage of their gross income to the national social security system (González-Corzo, 2013)

Resolutions 90, 122, and 369, approved in 2011, are also part of the legal framework to gradually decentralize agricultural commerce in Cuba. These measures authorize the direct sale of selected agricultural products to State tourism enterprises, and allow non-State producers to sell a portion of their output directly to such enterprises. Resolution 90 also created a new entity, FINTOUR, S.A., to offer credit financing to tourism enterprises engaged in direct commercial agreements with participating agricultural producers (González-Corzo, 2013). These policy measures were complemented by Decree-Law 289 and Resolution 99, also introduced in 2011, which authorized the provision of agricultural credits by State banks to non-State producers.

Decree-Law 289 eliminated the existing ceiling of 3,000 pesos (CUP) on bank loans to natural persons, and eliminated the 100 convertible peso (CUC) limits on payments by State Owned Enterprises (SOES) to self-employed workers, who provided goods and services to SOES, on a contractual basis (González-Corzo, 2013). Resolution 99 authorized the extension of bank-based credit financing (up to 500 CUP) to non-State agricultural producers (e.g. cooperatives and private farmers). Non-State agricultural producers can obtain credit financing to purchase and repair equipment, procure inventory, and obtain other essential inputs, including the costs of replanting and reconditioning previously planted fields (González-Corzo, 2013).

3.4 Economic Impact

The agricultural reforms introduced in 2007 have resulted in the expansion of the non-State sector, particularly in terms of its share of landownership, and its share of physical output in some categories of non-sugar agriculture.

The share of Cuba's agricultural land held by the non-State sector increased significantly since the onset of the agricultural reforms in 2007.[1] In 2007, the non-State sector held 44.6 % of the country's total surface, 46.3 % of the agricultural land, and 76.8 % of the land under cultivation. Credit and Services Cooperatives (CCS) and private farmers, which enjoy relatively higher levels of autonomy, held 28.6 % of the total land surface held by the non-State in 2007. They also owned 59.4 % and 34.8 % of the cultivated land in the non-State sector in that year.

While the non-State sector's share of the total land surface remained virtually unchanged (46 %) in 2014, its share of the agricultural land and land under cultivation increased to 69.1 % and 81.4 %, respectively. In addition, the share of non-State land held by the Credit and Services Cooperatives (CCS) and private farmers also increased significantly during the 2007-2014 period. In 2014, the CCS and private farmers held 49.3 % of the total land and 49.7 % of the cultivated land in the non-State sector (Table 5).

Table 6 presents non-sugar agricultural output for the 2008–2015 period. It includes production by the State and non-State sectors.

As Table 6 indicates, production increased in seven (7) of the nine (9) reported categories of (non-sugar) crops during the 2008-2015 period. These were: (1) viandas (22.5 %), (2)

[1] Cuba's non-State sector includes the Basic Units of Cooperative Production (*Unidades Básicas de Producción Cooperativa*, UBPC), Cooperatives of Agricultural Production (*Cooperativas de Producción Agropecuaria*, CPA), Credit and Services Cooperatives (*Cooperativas de Créditos y Servicios*, CCS) and private farmers (*privados*).

Table 5: Cuba: Land distribution based on tenure form, 2007 and 2014

2007		State	Non-State			
Thousand Hectares	Total	Total	Total	UBPC	CPA	CCS and Private
Total Land Surface	10 988,60	6 088,90	4 899,70	2 804,80	692,8	1 402,10
Agricultural Land	4 415,50	2 371,20	2 044,30	244,2	585,8	1 214,30
Cultivated Land	2 988,50	694,2	2 294,30	1 189,90	305,3	799,1
Non-Cultivated Land	3 631,00	1 677,00	1 954,00	1 258,30	280,5	415,2
Idle Land	1 232,80	627,2	605,6	465,4	73,4	66,8
2014		**State**	**Non-State**			
Thousand Hectares	**Total**	**Total**	**Total**	**UBPC**	**CPA**	**CCS and Private**
Total Land Surface	10 988,40	6 152,80	4 835,60	1 849,10	601,2	2 385,30
Agricultural Land	6 278,90	1 942,60	4 336,30	1 598,80	509,6	2 227,90
Cultivated Land	2 668,70	496,5	2 172,20	823	269,6	1 079,60
Non-Cultivated Land	3 610,20	1 446,10	2 164,10	775,8	240	1 148,30
Idle Land	n.a	n.a	n.a	n.a	n.a.	n.a

Source: Anuario Estadístico de Cuba (AEC), 2014

Table 6: Cuba: Non-sugar agricultural production, selected crops, tons.

CROPS	2008	2009	2010	2011	2012	2013	2014	2015	Chg.	% Chg.
Viandas [a]	2 150 700	2 236 000	2 250 000	2 280 000	2 337 000	2 239 000	2 507 056	2 633 618	482 918	22,5 %
Roots and tubers	1 392 500	1 565 600	1 515 000	1 445 000	1 452 000	1 580 500	1 670 864	1 743 422	350 922	25,2 %
Potato	196 100	278 600	191 500	165 600	130 933	106 700	53 308	123 938	–72 162	–36,8 %
Boniato	375 000	437 100	384 743	311 900	335 319	396 347	512 825	506 839	131 839	35,2 %
Malanga	240 000	199 400	137 400	132 100	153 782	185 922	269 590	246 472	6 472	2,7 %
Plantains	758 200	670 400	735 000	835 000	885 000	658 500	836 193	890 197	131 997	17,4 %
Bananas	280 800	245 400	249 200	250 000	195 496	150 336	203 225	234 471	–46 329	–16,5 %
Plantains	477 400	425 000	485 800	585 000	689 504	508 164	632 967	655 726	178 326	37,4 %
Vegetables	2 439 300	2 548 800	2 141 035	2 200 000	2 112 000	2 406 500	2 498 960	2 424 163	–15 137	–0,6 %
Tomato	575 900	750 000	517 040	601 000	557 100	678 000	454 112	551 007	–24 893	–4,3 %
Onions	128 100	131 300	111 737	143 500	118 244	126 876	112 779	107 181	–20 919	–16,3 %
Pepper	63 677	56 672	44 545	55 057	62 202	73 336	60 543	69 034	5 357	8,4 %
Cereals	761 700	868 400	778 863	920 400	1 002 000	1 098 800	1 013 495	781 058	19 358	2,5 %
Rice	436 000	563 600	454 400	566 400	641 600	672 600	584 800	418 036	–17 964	–4,1 %
Corn	325 700	304 800	324 463	354 000	360 400	426 200	428 695	363 022	37 322	11,5 %
Legumes	97 200	110 800	80 439	133 000	127 100	129 800	135 545	117 556	20 356	20,9 %
Beans	97 200	110 800	80 439	133 000	127 100	129 800	135 545	117 556	20 356	20,9 %
Tobacco	21 500	25 200	20 500	19 900	19 500	24 000	19 800	24 500	3 000	14,0 %
Citrus Fruits	391 800	418 000	345 000	264 500	203 700	166 900	96 810	115 384	–276 416	–70,6 %
Oranges	200 400	261 000	178 263	122 900	93 837	85 110	36 103	40 159	–160 241	–80,0 %
Grapefruit	166 100	121 500	137 660	112 000	84 741	63 979	41 421	56 268	–109 832	–66,1 %
Lemon	5 400	8 300	6 060	6 600	6 475	5 025	7 925	6 579	1 179	21,8 %
Other Fruits	738 500	748 000	762 045	817 000	964 900	925 000	884 464	942 675	204 175	27,6 %
Mangoes	228 700	269 300	203 595	185 000	286 385	285 526	177 834	260 076	31 376	13,7 %
Guava	126 500	84 900	71 581	85 000	103 191	124 964	180 397	158 720	32 220	25,5 %
Papaya	89 400	95 700	135 707	135 000	178 558	197 842	139 531	202 499	113 099	126,5 %
Cocoa	1 100	1 387	1 709	1 510	2 027	1 425	2 188	1 500	400	36,4 %

[a] Includes Roots and Tubers and Plantains

Source: Anuario Estadístico de Cuba (AEC), 2015

plantains (17.4 %), (3) cereals (2.5 %), (4) legumes (20.9 %), (5) tobacco (14 %), (6) other fruits (27.6 %), and (7) cocoa (36.4 %). Production of vegetables and citrus fruits declined 0.62 % and 70.6 %, respectively, during the same period. While non-sugar agricultural production increased in the majority of the crop categories shown on Table 6, these output levels were significantly lower than in 1989, the last year before the beginning of the "economic crisis of the 1990s," resulting from the disintegration of the Socialist Camp. The volatility in non-sugar agricultural production between 2008 and 2015 was primarily attributed to several factors such as adverse weather conditions (e.g. drought, hurricanes), difficulties in obtaining essential agricultural inputs, existing limitations and regulations, price controls, inefficiencies related to agricultural commercialization, the poor condition of warehousing and storage facilities, logistical difficulties associated with the transportation and cold storage of agricultural products, soil erosion and degradation, insufficient irrigation capabilities, and other administrative, organizational, and structural problems (Mesa-Lago, 2012; Nova González, 2013a; Spadoni, 2014).

Table 7 presents non-sugar agricultural output for the non-State sector, which includes cooperatives and individual (or private) farmers.

Between 2008 and 2015, agricultural production by the non-State sector increased in seven (7) of the nine (9) crop categories reported in Table 7. These were: (1) viandas (33.1 %), (2) plantains (27.6 %), (3) cereals (1.6 %), (4) legumes (13.5 %), (5) tobacco (12.9 %), (6) other fruits (27.4 %), and (7) cocoa (42.8 %). Production of vegetables and citrus fruits decreased 0.65 % and 70.5 %, respectively, during the 2008-2015 period. A comparison of the non-sugar output data shown on Tables 6 and 7 reveals that production by the non-State sector increased by a higher percentage, when compared to total production, in two (2) important crop categories: viandas and plantains.

The agricultural transformations initiated in 2007 have contributed to the expansion of the non-State sector's share of total production.

Table 7: Cuba: Non-sugar agricultural production, Non-State sector, selected crops, tons.

CROPS	2008	2009	2010	2011	2012	2013	2014	2015	Chg.	% Chg.
Viandas [a]	1 832 349	1 915 023	1 986 811	2 061 340	2 129 158	2 054 379	2 333 712	2 438 260	605 911	33,1%
Roots and tubers	1 205 406	1 348 447	1 350 001	1 321 141	1 342 252	1 477 836	1 584 836	1 638 279	432 873	35,9%
Potato	136 809	181 589	123 641	102 984	83 090	71 171	41 818	93 936	–42 873	–31,3%
Boniato	326 232	372 456	337 280	290 837	311 080	365 055	480 302	472 782	146 550	44,9%
Malanga	207 227	174 935	126 987	123 429	138 649	176 159	256 884	236 863	29 636	14,3%
Plantains	626 943	566 576	636 810	740 199	786 906	576 543	748 876	799 982	173 039	27,6%
Bananas	229 767	204 171	211 366	213 075	152 142	110 026	167 873	198 269	–31 498	–13,7%
Plantains	397 177	362 405	425 444	527 124	634 764	466 517	581 003	601 713	204 536	51,5%
Vegetables	2 001 680	2 049 220	1 741 004	1862 000	1 795 950	2 034 575	2 103 623	1 988 688	–12 992	–0,6%
Tomato	508 304	663 222	466 905	557 861	522 085	636 690	422 045	515 081	6 777	1,3%
Onions	118 484	121 203	103 941	135 270	113 771	122 253	108 796	102 680	–15 804	–13,3%
Pepper	55 602	46 562	38 186	48 512	55 853	66 079	53 332	62 341	6 739	12,1%
Cereals	685 441	763 357	713 150	831 144	939 240	973 038	919 169	696 689	11 248	1,6%
Rice	381 344	483 693	402 211	489 897	588 913	562 380	505 757	353 026	–28 318	–7,4%
Corn	304 097	279 663	310 939	341 247	350 327	410 658	413 413	343 664	39 567	13,0%
Legumes	94 265	104 671	76 802	128 515	122 665	124 593	126 040	107 030	12 765	13,5%
Beans	94 265	104 671	76 802	128 515	122 665	124 593	126 040	107 030	12 765	13,5%
Tobacco	21 250	24 934	20 273	19 680	19 284	23 847	19 674	23 987	2 737	12,9%
Citrus Fruits	148 400	162 107	148 116	105 777	78 782	55 290	41 381	43 776	–104 624	–70,5%
Oranges	82 718	85 904	69 726	41 111	33 573	21 229	15 022	16 832	–65 886	–79,7%
Grapefruit	42 310	44 459	52 183	38 194	23 676	18 453	8 791	10 547	–31 763	–75,1%
Lemon	4 815	7 258	5 156	5 591	4 515	3 567	6 838	4 454	–361	–7,5%
Other Fruits	680 933	678 825	719 098	768 240	916 299	855 518	835 416	867 326	186 393	27,4%
Mangoes	212 034	243 860	191 196	167 093	270 605	260 691	163 198	223 005	10 971	5,2%
Guava	116 225	72 691	65 571	78 417	94 632	109 621	169 165	146 424	30 199	26,0%
Papaya	77 044	85 195	124 904	124 386	170 423	188 564	131 232	190 361	113 317	147,1%
Cocoa	1 040	1 331	1 639	1 448	1 991	1 405	2 157	1 485	445	42,8%

[a] Includes Roots and Tubers and Plantains
Source: Anuario Estadístico de Cuba (AEC), 2015

The non-State sector accounts for more than 80 % of total non-sugar agricultural output in the entire nine (9) crop categories included in Table 8. The expansion of the non-State sector, in terms of its share of total non-sugar agricultural output, since 2008, is even more remarkable in crops in which the State has traditionally maintained its monopoly, such as potatoes and tomatoes, suggesting that since 2007, as part of the nation's efforts to "update" its socialist economic model, Cuban agriculture has gradually transitioned towards an increasingly decentralized agricultural model.

Table 8. Cuba: Non-State Sector's Share of Total Non-Sugar Output

CROPS	2008	2009	2010	2011	2012	2013	2014	2015
Viandas [a]	85,2 %	85,6 %	88,3 %	90,4 %	91,1 %	91,8 %	93,1 %	92,6 %
Roots and tubers	86,6 %	86,1 %	89,1 %	91,4 %	92,4 %	93,5 %	94,9 %	94,0 %
Potato	69,8 %	65,2 %	64,6 %	62,2 %	63,5 %	66,7 %	78,4 %	75,8 %
Boniato	87,0 %	85,2 %	87,7 %	93,2 %	92,8 %	92,1 %	93,7 %	93,3 %
Malanga	86,3 %	87,7 %	92,4 %	93,4 %	90,2 %	94,7 %	95,3 %	96,1 %
Plantains	82,7 %	84,5 %	86,6 %	88,6 %	88,9 %	87,6 %	89,6 %	89,9 %
Bananas	81,8 %	83,2 %	84,8 %	85,2 %	77,8 %	73,2 %	82,6 %	84,6 %
Plantains	83,2 %	85,3 %	87,6 %	90,1 %	92,1 %	91,8 %	91,8 %	91,8 %
Vegetables	82,1 %	80,4 %	81,3 %	84,6 %	85,0 %	84,5 %	84,2 %	82,0 %
Tomato	88,3 %	88,4 %	90,3 %	92,8 %	93,7 %	93,9 %	92,9 %	93,5 %
Onions	92,5 %	92,3 %	93,0 %	94,3 %	96,2 %	96,4 %	96,5 %	95,8 %
Pepper	87,3 %	82,2 %	85,7 %	88,1 %	89,8 %	90,1 %	88,1 %	90,3 %
Cereals	90,0 %	87,9 %	91,6 %	90,3 %	93,7 %	88,6 %	90,7 %	89,2 %
Rice	87,5 %	85,8 %	88,5 %	86,5 %	91,8 %	83,6 %	86,5 %	84,4 %
Corn	93,4 %	91,8 %	95,8 %	96,4 %	97,2 %	96,4 %	96,4 %	94,7 %
Legumes	97,0 %	94,5 %	95,5 %	96,6 %	96,5 %	96,0 %	93,0 %	91,0 %
Beans	97,0 %	94,5 %	95,5 %	96,6 %	96,5 %	96,0 %	93,0 %	91,0 %
Tobacco	98,8 %	98,9 %	98,9 %	98,9 %	98,9 %	99,4 %	99,4 %	97,9 %
Citrus Fruits	37,9 %	38,8 %	42,9 %	40,0 %	38,7 %	33,1 %	42,7 %	37,9 %
Oranges	41,3 %	32,9 %	39,1 %	33,5 %	35,8 %	24,9 %	41,6 %	41,9 %
Grapefruit	25,5 %	36,6 %	37,9 %	34,1 %	27,9 %	28,8 %	21,2 %	18,7 %
Lemon	89,2 %	87,4 %	85,1 %	84,7 %	69,7 %	71,0 %	86,3 %	67,7 %
Other Fruits	92,2 %	90,8 %	94,4 %	94,0 %	95,0 %	92,5 %	94,5 %	92,0 %
Mangoes	92,7 %	90,6 %	93,9 %	90,3 %	94,5 %	91,3 %	91,8 %	85,7 %
Guava	91,9 %	85,6 %	91,6 %	92,3 %	91,7 %	87,7 %	93,8 %	92,3 %
Papaya	86,2 %	89,0 %	92,0 %	92,1 %	95,4 %	95,3 %	94,1 %	94,0 %
Cocoa	94,5 %	96,0 %	95,9 %	95,9 %	98,2 %	98,6 %	98,6 %	99,0 %

[a] Includes Roots and Tubers and Plantains
Source: Anuario Estadístico de Cuba (AEC), 2015, and author's calculations

4 Urban Agriculture in Cuba

4.1 Origins and guiding principles

Cuban urban agriculture emerged spontaneously, as part of a grassroots movement, primarily centered in the City of Havana, eventually developing as an alternative to the extensive growth model of agricultural production during the early years of the "Special Period" in the 1990s (Rosset & Benjamin, 1994; Koont, 2009). Urban agriculture is an intrinsic component of Cuba's "alternative model" of agricultural production, which focuses on crop diversity, instead of monoculture (Rosset & Benjamin, 1994). Cuba's alternative model of agricultural production also promotes broad community participation, cooperation between producers and their local communities, strong linkages between natural resources (or the environment), human resources, and physical inputs, the application of organic fertilizers and bio-pesticides to replace chemical inputs, and the replacement of tractors with animal traction (Rosset & Benjamin, 1994). In addition, this model emphasizes the need to preserve the environment and the ecosystem through systematic training of all resources involved in agricultural production, systematic technical assistance, and the introduction of scientific practices that correspond to local and regional environments (Rosset & Benjamin, 1994).

Cuba's urban agricultural movement was officially recognized on September 27, 1997, when then Minister of the Armed Forces (FAR), Raúl Castro, declared this day as "National Urban Agriculture Day" (FAO, 2013). The institutionalization of urban agriculture in Cuba was accelerated after the approval of Resolution 208 by the Ministry of Agriculture in 1998. Resolution 208 (1998) created the National Group for Urban Agriculture *("Grupo Nacional de la Agricultura Urbana [GNAU]")* in an effort to institutionalize the country's (until then) ad hoc urban agriculture movement, which emerged spontaneously as a response to the challenges confronted by Cuban agriculture during the early years of the "Special Period" (Rosset & Benjamin, 1994; Koont, 2009). In 1999, Havana's Physical Planning Direction *("Dirección de Planificación Física")* recognized urban agriculture as a permanent, differentiated, form of agricultural production consisting of *organopónicos* (raised-bed plots or gardens), *huertos* (orchards), *parcelas* (parcels) ¸and *patios* (backyards).

The institutional recognition of urban agriculture as a permanent form of agricultural production in Cuba paved the way for the development and implementation of the guiding principles that govern urban agriculture practices on the island today. This process, in turn, led to the conceptualization of a very specific model of urban agriculture, founded on three core "best practices:" (1) the concentration of agricultural and food production in the urban or peri-urban perimeter,(2) the application of intensive methods that take into account the interrelation (between) humans-crops-animal(s)-environment, and the characteristics of the (local) urban facilities and infrastructure, (3) the promotion of labor force stability and diversified production (of crops and livestock) year round, based on sustainable practices that permit recycling waste (or leftovers) (FAO, 2013).

There are several key elements of Cuba's relatively distinct urban agriculture model. In consistency with urban agriculture practices around the World, urban agriculture in Cuba focuses on production, distribution and consumption in the urban and semi-urban perimeter. The strong focus on immediate urban surroundings of urban agriculture in Cuba can be best summarized by the phrase: *"Producir en el barrio, por el barrio y para el barrio"* ("Production in the neighborhood, by the neighborhood, and for the neighborhood") (FAO, 2003). Such production, in turn, is guided by six fundamental principles:

1. Sustainable, agro-ecological, production,
2. Production of diversified crops and livestock,
3. Small-scale crops (or plantings) by State producers (e.g., State enterprises and farms), and non-State producers (e.g., cooperatives and private farmers),
4. The use of adequate economic incentives to stimulate efficient, but sustainable, agricultural production in the urban and peri-urban perimeter,
5. Harmony with the urban environment and its surroundings, and
6. Production with maximum efficiency, on a sustainable basis, using "calibrated decentralization," based on the principle of "decentralization without losing control, and centralization without hindering initiative."

4.2 Organizational structure

At the national level, the program's organizational structure is headed by the National Urban Agriculture (UA) Group, followed by a provincial UA Delegate, who oversees the functions of two subordinate groups at the municipal level: (1) the Municipal UA Enterprise Council, which includes several municipal enterprises involved in urban agriculture (e.g., *Empresa Cultivos Varios*, *Empresa Comercializadora El Trigal* (temporarily closed in May 2016), *Empresa Proyectos Agropecuarios*, etc.), and (2) the Municipal UA State council, responsible for overseeing State enterprises engaged in urban agriculture (e.g., State farms, and auto-consumption plots adjacent to non-agricultural State-owned enterprises [SOEs]).

Cuba's Urban Agriculture Program also includes 28 sub-programs, specialized in the production of specific crops and livestock (Herrera Sorzano, 2009). Under these subprograms, different types of productive entities (or units) are able to produce diversified crops, as well raise various types of livestock (Herrera Sorzano, 2009). The predominant productive units that participate in the urban agriculture subprograms are: (1) auto-consumption plots, (2) producers of protected crops, (3) backyards and parcels, (4) intensive orchards, and (5) *organopónicos* (Herrera Sorzano, 2009).

4.3 Producers and production

The City of Havana remains as the epicenter of urban agriculture in Cuba. The productive units involved in urban agriculture in the City of Havana include 97 *organopónicos*, 700 diversified farms, 170 livestock farms, 27 forested areas, 2 provincial enterprises specialized in porcine livestock, 20 *Unidades Básicas de Producción Agropecuaria (UBPC)* (Basic Units of Cooperative Production), 91 *Cooperativas de Créditos y Servicios (CCS)* (Credit and Services Cooperatives), 89,000 backyards, measuring less than 800 square meters (m^2), and 51,000 parcels, also measuring less than 800 m^2 (FAO, 2013).

In 2013, production by all types of productive entities participating in urban agriculture in Havana was as follows: 63,000 tons (t) of vegetables, 20,000 t of fruits, 10.5 million liters (l) of milk, and 1,700 t of beef, pork, and poultry (FAO, 2013). Combined sales of all urban agriculture products reached 58,000 t in 2013; of these, 26,000 t (or 44.8 %) were sold directly to the population, of which 21,000 t (or 80.8 %) were sold in agricultural markets (FAO, 2013). An estimated 6,770 t of various urban agriculture products, representing 11.7 % of the total sold in 2013, were distributed to more than 300,000 individuals at "socially-prioritized entities" (e.g., schools, daycare centers, hospitals, maternity wards, etc.) in the City of Havana (FAO, 2013).

Between 300,000 and 400,000 persons are employed in urban agriculture at the national level (FAO, 2013). Of these, an estimated 167,000 are women, and 40,000 are retirees (FAO, 2013). Some 35,500 hectares (ha) are dedicated to urban agriculture nationwide, and there are 145,000 parcels, 385,000 backyards, 6,400 intensive orchards, and 4,000 *organopónicos* dedicated to urban agriculture throughout Cuba (FAO, 2013).

4.4 Policies and practices to support urban agriculture

Since the mid-1990s, Cuba's Urban Agriculture Program has been supported by a series of policies based on: strong institutional support, calibrated decentralization, and the application of a "holistic approach" to support best practices. Urban agriculture is supported by 11 research institutes, 5 specialized provincial programs in Havana, and the 28 of the aforementioned urban agriculture sub-programs (FAO, 2013). In addition, there are 52 *Consultorio-Tienda Agropecuario (CTA)*, located in 15 municipalities in the Capital, which provide urban agriculture producers with seeds, and organic matter for soil improvement and management (FAO, 2013). Urban agriculture producers also have access to microcredits from State-run *Banco Metropolitano* in Havana (FAO, 2013).

Urban agriculture is also supported by "calibrated decentralization" based on the tenet, "decentralize without losing control, centralize without hindering initiative," which applies to production, commercialization, and to the technical support provided to the national Urban Agriculture Program (FAO, 2013). Urban agriculture in Cuba is also supported by a "holistic approach" focusing on fostering the relationship between producers, crops, animals, and the environment, minimizing the use of external inputs, and prohibiting the application of chemicals (FAO, 2013). This "holistic approach" to support urban agriculture also focuses on pest control, and the production of compost and organic matter (FAO, 2013).

4.5 Spillover effects

A report by the Earth Institute at Columbia University (2012) identified several positive externalities or spillover effects associated with urban agriculture in high density urban environments.[2] Urban agriculture can play a critical role in improving the urban environment through runoff water mitigation, soil remediation, and energy use reduction (Earth Institute, 2012). It can also make valuable contributions to community development and community revitalization by transforming blighted urban spaces, and providing a wide range of opportunities for social integration, local self-sufficiency in the production of some agricultural products, and engagement opportunities for community members particularly women, youth, and the elderly (Earth Institute, 2012; Policy Link, 2012). Urban agriculture can also contribute to improved nutrition and health outcomes, through greater access to locally produced healthier foods (Policy Link, 2012), and to the development of new agricultural extension programs and the formation of new technical personnel (Golden, 2013).

In the case of Cuba, particularly in the City of Havana, the principal contributions of urban agriculture have been in the areas of employment and job creation, which are directly connected to community development and the improvement of social capital, increased biodiversity, and the transformation of blighted urban areas into green spaces (FAO, 2013). Nationwide, an estimated 300,000 to 400,000 individuals are employed in urban agriculture, of which 20 % are women, another 20 % are young workers (between the ages of 17–30), and 10 % are retirees (FAO, 2013). In 2003, when the National Urban Agriculture Plan was created, nationwide employment in urban agriculture was estimated at around 326,000; two years later (in 2005), it reached an estimated 384,000, representing an increase of 17.8 % (FAO, 2013). In the City of Havana an estimated 15,000 individuals work in urban agriculture; of these, 3,770 (25.1 %) are women; and 7,840 (52.3 %) are 60 years of age or older (FAO, 2013).

The expansion or urban agriculture since the early days of the "Special Period" in the 1990s has contributed to improved plant and crop biodiversity, particularly in the City of Havana and its peri-urban areas. There are 28 seed planting units (or stations) in the City of Havana, in addition to 10 municipal horticultural seed farms, which currently supply about 40 % of the lettuce seeds, and 20 % of the radish seeds used by urban farmers, just to cite two examples (FAO, 2013). Since the mid-1990s, urban agriculture has contributed to the development of 56 species of vegetables and fresh condiments, and in order to encourage plant (or crop) biodiversity, *organopónicos* and intensive orchards are required to plant (or produce) a minimum of 10 different species annually (Herrera Sorzano, 2009).

Another spillover effect associated with the expansion of urban agriculture, mainly in the City of Havana, has been the "greening" of the urban environment. The replacement of blighted urban spaces, resulting from the loss of manufacturing or industrial capacity in cities and urban areas, with "green spaces" – often associated with urban farming –is among the solutions to urban decline implemented in several cities in the U.S. and in the Ruhr industrial region in Germany (Buzby, 2014). Green urban spaces offer many advantages; they provide spaces for outside recreation for city dwellers, contribute to community revitalization by improving the physical environment and its surroundings (Land Policy, 2012); and can "even help a city reestablish its identity and character through the concepts of land art and landscape architecture" (Buzby, 2014). In the City of Havana, urban agriculture has contributed to the redevelopment of vacant urban spaces *("espacios baldíos")* into green spaces, where community members usually gather to purchase locally grown produce, and engage in other economic and social interactions (Herrera Sorzano, 2009).

[2] Given existing similarities between New York City (NYC) and the City of Havana, in terms of population density, some aspects of the built environment, etc., we believe that some of the key findings of this report with regards to the benefits of urban agriculture in NYC are also applicable to the City of Havana.

5 Prospects for the Future

Despite its positive contributions, urban agriculture is far from a panacea to solve the "food problem" in Cuba. Even though it enjoys institutional recognition and support, urban agriculture in Cuba faces several challenges, structural constraints, and regulatory limitations. One principal challenge, confronted not only by those engaged in urban agriculture but by all Cuban agricultural producers, is the severely deteriorated state of Cuba's physical infrastructure, its insufficient and inefficient transportation system, and the primitive state of its telecommunications infrastructure. With regards to organic inputs, producers engaged in urban agriculture must regularly contend with insufficient domestic production of organic matter, compost, and other essential inputs (FAO, 2013). They also face limited access to water, unreliable irrigation systems, inadequate transportation and insufficient refrigerated storage facilities. Due to the inability of the Cuban economy to produce essential inputs (e.g., irrigation, refrigeration, and packaging equipment), urban agriculture producers remain excessively dependent on imported inputs, which limit their ability to increase output, make substantial value-added improvements, and attain higher yields. Cuban urban agriculture producers also encounter a series of difficulties when it comes to finding and retaining qualified human resources (e.g., technicians and professionals).

Due to Cuba's dual monetary system, the potential of Cuban urban agricultural producers is also limited by the inexistence of competitive input markets where producers could obtain essential inputs in regular Cuban pesos (CUP) at prices that correspond to their real purchasing power. Similar to other non-State agricultural producers (e.g., Cooperatives and private farmers), producers engaged in urban agriculture in Cuba regularly rely on the State-run "hard currency stores" and on the black market to obtain essential inputs. Their potential is also limited by their inability (at the present time) to successfully insert themselves in privately owned, internationally competitive, global agro-industrial value chains. In addition, like most agricultural producers in Cuba, urban agriculture producers are constrained by the existing regulatory framework that limits producers' autonomy with regards to the commercialization of their product, their ability to freely contract labor, and prohibitions against foreign investment, the accumulation of private property, and the concentration of wealth.

Despite these challenges, and limitations, Cuba's urban agriculture offers some attractive medium-term and long-term possibilities, and has the potential to make more significant socioeconomic contributions particularly in the City of Havana and in other major urban centers on the island. The City of Havana, for example, with its more than two decades of experience with urban agriculture, could potentially increase the number of urban farms operating in its urban and peri-urban periphery by facilitating the redevelopment of vacant lots. The fact that in Havana vacant properties are scattered throughout the city, instead of occupying large swathes of the city, as in Detroit, Michigan, for example, offers the possibility for the expansion of urban agriculture in harmony with the built-environment. In addition to reducing urban blight, lowering emissions, and providing cost savings for local consumers, the redevelopment of vacant properties into urban farms, community gardens, or any other form of urban agriculture, would likely contribute to higher property values, and could potentially serve as an incentive for much needed private investment in some of the capital's dilapidated housing stock.

Cuban urban agriculture particularly in the City of Havana, also has the potential to develop strong linkages with one of the most dynamic sectors of the Cuban economy: tourism. According to official Cuban figures, the number of international tourists (or visitors) increased 17.4 %, from 3,002,745 in 2014 to 3,524,779 in 2015. Similarly, overnight stays rose 17.9 % and the occupancy rate in tourism establishments grew 6.5 %, from 46.1 % to 49.1 %, and gross tourism receipts increased 10.7 %, from 1.7 billion convertible pesos (CUC) to 1.9 billion CUC during the same period *(Turismo Internacional Indicadores Seleccionados, Enero-Diciembre, 2015, Oficina Nacional de Estadísticas e Información* [ONEI], 2016).[3] There are plans to double the number of rooms designated for tourism in the City of Havana by 2030, indicating that Cuba, and its capital, continue to prioritize the expansion of the tourism sector as a key element of the country's plan to "update" it socialist economic model.

Improved diplomatic relations and commercial ties with the United States are likely to contribute to significant increases in the number of international tourists visiting Cuba, and the City of Havana, in the near future. The potential influx of American visitors, including larger numbers of Cuban-Americans, offers the potential for increased linkages between urban agriculture and tourism. Similarly, the possibility of exporting to the U.S. market, under a scenario of "normalized" bi-lateral trade, represents another potential opportunity for Cuban urban agriculture. This would, of course, require legislative changes by the U.S. Congress with respect to U.S. policy towards Cuba, and the successful insertion or Cuban urban agriculture producers in global agricultural value chains with a strong presence in the highly competitive, and profitable, U.S. market.

Their successful insertion into global agricultural value chains is indeed one of the most promising possibilities for

[3] Gross tourism receipts include expenditures by international visitors in tourism establishments, including payments to national enterprises for transportation services. It excludes expenditures in non-State, or private, establishments, and wholesale purchases of raw materials and other inputs by tourism enterprises (*Anuario Estadístico de Cuba* [AEC], 2014).

Cuban agricultural producers. This process could take one or more of three common forms or modalities: (1) some Cuban urban agricultural producers would enter one or several global value chains as primary agricultural or commodity suppliers, offering high quality, certified organic produce, for which U.S. and international consumers would be willing and able to pay a premium, (2) others would enter as partners, capable of providing, value-adding, post-harvest handling and processing services, and (3) others could be integrated as marketers and service providers at different levels within the value chain (Hartwich, 2012).

The successful integration of Cuban urban farmers into global agricultural value chains would more than likely require coordinated public policies, most of which represent a radical departure from long-held ideas among the Cuban leadership, and strong political will to implement them. International experiences with regards to the successful integration of small-scale, urban producers, into the global agricultural value chains, suggest the need for coordinated public policies such as:

- improving infrastructure and telecommunications (mainly by allowing foreign direct investment (FDI) in these sectors),
- facilitating the creation and expansion of private information systems (to allow markets to perform the critical function of "price discovery"),
- facilitating the creation of private commodity exchanges, where urban agriculture producers could trade their products, establish credit, and measure their returns on investment (ROIs), introduce and enforce standard marketing contracts (to provide the legal framework to govern strategic partnerships between urban farmers and the global agricultural value chains in which they wish to participate),
- promoting voluntary partnerships between urban farmers and international agro-businesses, commodity wholesalers, and other entities with global agricultural value chains, and
- supporting the creation and expansion of specialized business and financial services designed to meet the needs of all types of urban farmers (Bresnyan & Werbrouck, 2008; Sievers & Saaralaien, 2011).

6 Conclusions

In the case of Cuba, as in many highly urbanized, lesser-developed countries (LDCs), successful urban agriculture strategies also require a participatory, locally oriented, approach and strong institutional support. They also require building strong linkages with key sectors of the national economy, such as tourism, and the successful integration of urban agricultural producers into global agricultural value chains. From a profit-maximization and a utility-maximization perspective, allowing producers the freedom to choose which crops they will produce, when they will produce them, and to whom their crops will be sold are essential components to ensure the success and long-term viability of urban agriculture at the local and national levels. However, given the excessive levels of State intervention and paternalism, the strict limitations of private property rights, the well-documented irrationalities and inefficiencies, and the wide range of contradictions that characterize the Cuban economy at the present time, allowing urban agriculture to reach its full potential will require the immediate implementation of profound and radical economic, legal, and political transformations.

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