

Reorientation in Agriculture

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The breakdown of the Soviet Union and the socialist bloc in Eastern Europe which began in 1989 led many to believe that the collapse of Castro's Cuba would follow closely behind. Instead, Cuban policy-makers demonstrated remarkable ingenuity, carving a new path for socialist Cuba and surviving a crisis "few developing nations could have endured...without falling into chaos" (Azicri, 2000: 69). In August of 1990 Cuban leadership declared the beginning of the Special Period in Peacetime, employing austerity measures designed for war conditions to brace the nation for the deep economic crisis which ensued. Both statistically and anecdotally, the crisis was at its worst in 1993 when the average Cuban adult lost 20 pounds due to food shortages (Sinclair and Thompson, 2001: 10) and there was an eruption of 51,000 cases of optic neuropathy—a degenerative illness caused by nutrient deficiencies (Azicri, 2000: 84). The early 1990's thus marked a particularly difficult and volatile time for the Cuban revolution. It was a time where "days were frequently filled with unrelieved hardship and adversity in the pursuit of even the most minimum needs of everyday life, day after day" (Pérez, 1995: 387). It was also a time when, bit by bit, the government made substantial and unforeseen changes in its approach to everything from economic policy to agriculture. This paper thus establishes the basis of the need for change by considering contributing factors of the Special Period and looking at the depth of the crisis in both agriculture and food security. The paper then moves on to explore the radical redirection of Cuban agriculture, looking at the Basic Units of Cooperative Production, Farmers' Markets, Urban Agriculture, and Low Input Sustainable Agriculture.

Contributing Factors

Literature regarding the economic crisis which precipitated the Special Period in Cuba consistently cites the collapse of the Soviet Union in conjunction with the tightening of the U.S. embargo as the cause. It is certain both that the demise of the Soviet socialist bloc was the event which set the course for Cuba's economic crisis and that the reinforcement of the U. S. blockade ensured that the path would be difficult. Yet to exclude the actions and policies of the Cuban government from the equation is to reduce Cuba to the role of pawn in its own historical process.¹ Indeed, the recognition of the role of the actions of the Cuban state in the contributing factors of the crisis is recognition of Cuban agency. Cuban social scientist Espinoza Martínez (1995), in his analysis of the economic crisis of the early 1990's, argues that it was the demise of the Soviet Union and the tightening of the U.S. embargo, combined with vulnerabilities of the Cuban economy, which led to near collapse. Espinoza's analysis is echoed in Álvarez' discussion of "Antecedents of the Agricultural Policies of the 1990's" in which he argues that "the inefficiency of the state agricultural sector" was the third factor which led to the severity of the crisis in the early 1990s. (Álvarez, 2004: 52, 69) The notion that a third factor—vulnerability of the Cuban economy and the inefficiency of the state sector of agriculture—contributed to the crisis is both central to an advanced understanding of the Cuban economy and Cuban agriculture, respectively, and was essential for recognition of the agency of the Cuban state. If Cuba is to play (or has played) a role in its own historical process, then it is, by necessity, an actor. To deny the role of the Cuban state in the successes or the failures of the revolution is to disempower Cuba and Cubans. This paper thus argues that there are three factors contributing to the economic crisis of the early 1990's: the collapse of the Soviet Union, the tightening of the U.S. blockade, and a dependent and inefficient state sector.

Depth of the Crisis

The experience of the early 1990's, especially 1993, has left an indelible mark on the consciousness of the Cuban people. Living in a survival economy, life during the Special Period "came to resemble life under war conditions" (Azicri, 2000: 75), as access to food, medicine, transportation and even electricity became uncertain. Indeed, average daily caloric intake dropped by more than 500 calories per person (FAO, 2004: 1) and many women left their jobs to dedicate themselves to the pursuit of now-scarce basic necessities full

1. In both the so-called Spanish-American War in 1898 and in the resolution of the Cuban Missile Crisis in 1962, the Americans and the Spanish and the Americans and the Soviets, respectively, excluded Cubans from the resolution of crises and, thereby denied them agency.

time. The situation got so bad that “street demonstrations and anti-government protests erupted in Cojímar and Regla in 1993 and in Havana in 1994.” (Pérez, 1995: 396) This section looks at the agricultural conditions and the consequent state of food security during this extraordinarily difficult time.

Agriculture

Cuba’s dominant state sector had developed an input-dependent agriculture which relied heavily on their trading relationship with the socialist bloc in Eastern Europe. When the socialist bloc crumbled and the United States tightened its embargo against Cuba, the precariousness of the chemical-intensive mono-crop, monoculture model of agriculture revealed itself and, by 1994, agricultural production levels had dropped to 55 percent of 1990 levels. (Sinclair and Thompson, 2001: 10) At the same time, world prices for sugar (which had typically been one-fifth of what the Soviets had paid for Cuban sugar) fell from 13.6 U.S. cents per pound in 1989-1990 to 9.1 cents per pound in 1990-1991. (Azicri, 2000: 132) The effect was devastating and a new, extensive rationing system was instituted to ensure equitable distribution of scarce resources. (Murphy, 1999: 8) As a result, there were “sharp reductions in the availability of food products in the rationed market.” (Álvarez, 2004: 140) Lack of replacement parts and fuel meant that farm machinery sat idle in the fields and as much as a third of harvests rotted in the fields. (Burchardt, 2000: 2) Thus, the government re-instituted the use of draught animals in the fields. (Pérez, 1995: 386) In 1991, Fidel called upon Cubans for a large scale mobilization of voluntary agricultural work (Pérez, 1995: 388; Rosset and Benjamin, 1994: 66-69; Frank, 1993: 153) as the decades of the Classical Model had precipitated urban migration. The agricultural development model pursued during the revolutionary era produced a dependent food economy which, when the Soviet Union began to disintegrate, devastated Cuba.²

Food security

Though Cuba “has always ranked as a food deficit country” (Nieto and Delgado, 2001: 47), “it should be noted that during the period preceding the economic crisis, food production levels showed sustained growth for almost every commodity” (Martin, 2001: 58) under the *Programa Alimentario Nacional* or PAN.³ The implementation of the PAN, however, was interrupted by the onset of the crisis which reversed Cuba’s remarkable achievements in

2. When considering Cuba’s agricultural redirection as a possible model for food security, it is worth noting that most countries in the world are currently engaged in deeply dependant food economies.

3. The PAN, introduced as part of the process of Rectification of Errors and Negative Tendencies, consisted of 36 programs designed to meet the goals of agricultural diversification and food self-sufficiency which had been abandoned in the early years of the revolution.

food security (Rosset and Benjamin, 1994: 24). By 1993, “the daily intake of the average Cuban citizen had descended to 1863 calories” (Koont, 2004: 1-2), well below the FAO recommended minima for Cuba of 2,400 calories (Álvarez, 2004b: 6), and a far cry from the 2,898 calorie diet of the late 1980’s (Perfecto, 1994: 99). Cuba’s food security crisis was unique in that, whereas in other countries crises consistently affect the poor disproportionately, Cuba’s food programs for vulnerable populations and the ration system ensured that the weight of the problem was shared. (Sinclair and Thompson, 2001: 10) Thus, during the economic crisis of the early 1990’s, food security threatened to be the destabilizing factor in Cuban politics, but through fair and effective distribution—even of insufficient resources—the Cuban leadership was able to weather the storm.

Radical Redirection of Agriculture

By 1991, Fidel Castro had declared food the number one national priority. (Chaplowe, 1996: 1) Indeed, as evidenced by the anti-government protests in 1994, lack of food security had demonstrated itself to be the most critical dimension of the crisis because it threatened national security. (Carranza and Valdés, 2004: 5) Something had to be done. Thus, since the magnitude of the problem required alternative solutions (Díaz, 1997: 19), the government embarked on the so-called third agrarian reform in 1993-1994. (Díaz, 1997: 15). State farms were converted into *Unidades Básicas de Producción Cooperativa* (UBPCs or Basic Units of Cooperative Production), farmers’ markets called *agropecuarios* were opened, Urban Agriculture (UA) was facilitated by the government, the nation switched from Classical Model agriculture to alternative Low Input Sustainable Agriculture (LISA), and in addition a number of existing strategies were re-emphasized.

Aspects of this third agrarian reform represented a drastic shift in ideology. For the formation of the UBPCs, the traditional preference for state-controlled agriculture was dropped; for the opening of the *agropecuarios* the strong government opposition to free markets was overruled; while the switch to LISA agriculture ran contrary to paradigm of an entire generation of Soviet-influenced agriculturists and scientists. Even the drive for increased UA stood in contrast to the expectations of Cubans who had become accustomed to the paternalism of the state. Indeed, the redirection of agriculture initially promised an empowering new model in place of tightly controlled, centralized agriculture. Simultaneously, major changes were taking place in all sectors of the economy. There was a renewed emphasis on tourism (Azicri, 2000: 157), foreign trade was restructured to favor Latin America, Canada, Europe and Asia (Nieto and Delgado, 2001: 41), and the U.S. dollar was

legalized. (Azicri, 2000: 74) In fact, it is fair to say that the radical redirection of agriculture took place as part of an overall liberalization of the economy.

The major changes in both agriculture and the economy in general were a rapid and direct response to the enormous depths of the crisis in an attempt to secure the gains made in the revolutionary era. Broadly speaking, the measures have proven successful. This has been possible because of the government's overwhelming determination to achieve the most equitable distribution possible. The government placed all available products under a regimen of rationing,⁴ subsidized central industries, and maintained the priority of health care, education, and social security. (Carranza and Valdés, 2004: 4) Nevertheless, some measures, like the opening of the *agropecuarios*, the legalization of the dollar and the promotion of tourism, also generated a renewed situation of differential access. In fact, "Fidel himself recognized the increment of inequality and called for the revolutionaries to be understanding" (Azicri, 2000: 140)—a tall order for a population raised for two generations on the ideology of absolute social equity. Thus, while the policies enacted in the depth of the crisis were designed to safeguard social equity, they simultaneously re-established an economy of differential access.

Measures which engendered renewed differential access were those measures which both sought to bring about increased production through material incentives (as with the *agropecuarios*) and to facilitate capital accumulation for the purchase of foreign foodstuffs and goods (as with the legalization of the U.S. dollar and the new emphasis on tourism). Both increases in production and capital accumulation were required to address the severe food insecurity (largely brought about by the loss of trading partners and the U.S. embargo) because of the ongoing inefficiency of the agricultural sector (which had already been a problem prior to the onset of the crisis). It is worth reiterating that Cuba has always ranked as a food deficit country. While this is, in part, due to the island's colonial and neocolonial history as a sugar producer for Spain and the United States, respectively, it is important to bear in mind that early in the revolution the new government elected to continue on this path with the Soviet Union, thereby reproducing the dependent mono-crop, mono-export economy. Both the inefficiency and the ongoing mono-crop character of the agricultural sector played key roles in the devastating food crisis of the early 1990's. In the search for solutions to the food crisis, initially the government emphasized productive efficacy while sugar continued to dominate the agricultural sector.

4. Though the system of rationing first implemented in 1962 has been widely criticized—both for its extraordinary duration and, since the inception of the Special Period, for being insufficient—the government's recent commitment to eliminate the ration system is disconcerting because Cuba's ration system has long been the structure which guarantees a base level of food security to all citizens.

Unidades Basicos de Produccion Cooperativos

Seeking a more efficient model, the Cuban government looked to its own agricultural landscape. In the spring of 1993, farmland in Cuba was distributed as follows: 80 percent belonged to state farms, 15 percent to cooperatives, and 5 percent to individual private farmers. (Levins, 1993: 55) Yet, with only 20 percent of the agricultural land, the non-state sector “contributed 35 percent of national production, using less than 20 percent of the resources invested in agriculture.” (Nova, 1994, cited in Martin, 2001: 58) The comparatively autonomous sector proved notably more efficient than the state sector. Thus on September 10, 1993, a bill was passed by the Communist party approving the creation of UBPCs (Díaz, 1999: 111), and on September 20, 1993, Law-Decree No. 142 formally established the UBPCs (Álvarez, 2004: 75) based on the model of the successful non-state agricultural production cooperatives or CPAs. (Nova González, 1998: 1) The transition occurred rapidly and by late 1994 there were 2,879 UBPCs which held 46.5 percent of all agricultural lands (Azicri, 2000: 145), approximately 50 percent of state agricultural land. The idea was that by following both the economic framework and the means of remuneration used by the CPAs (Álvarez, 2004: 80) the state could facilitate more efficient and sustainable agriculture on its land. (Messina, 2000: 435) Thus began Cuba’s so-called third agrarian reform.

The formation of UBPCs took place as state lands were granted to former state farm employees in the form of permanent usufruct. (Díaz, 1997: 15)⁵ Now the predominant farm structure in Cuba (Martin, 2001: 62), UBPCs are, on average, 10 percent of the size of previous state farms (Messina, 2000: 435). The smaller size is designed not only to promote productive efficiency, but also to facilitate the democratization of the agricultural sector through decentralized decision-making. The shift from centralized planning to locally centered, empowered decision-making (Sinclair and Thompson, 2001: 19) represents a radical ideological shift. At the same time, however, fuller steps clearly remain to be taken. Indeed, while Cuban social scientist Beatriz Díaz describes the creation of the UBPCs as “part of a larger political and economic process of decentralization in Cuba aimed at diversifying civil society and creating bases for greater democratization by increasing the direct participation of the workers in decision-making,” (Díaz, 1999: 18), she elsewhere cites the lack of autonomy and absence of a sense of ownership as reasons for the poor performance of the UBPCs. (Díaz, 1997: 16) In fact, the state retains ownership of the land, reserves the right to “dissolve any UBPC... according to economic or social interests determined by the government,” (Gaceta offi-

5. The International Development Research Centre of Canada defines usufruct as “the rights to farm a piece of land and profit from the produce but not to ownership” (IDRC, 2005: 3).

cial 1993 cited in Burchardt, 2000: 3) determines which crops are to be planted, sets production quotas, and determines the location of sale of 80 percent of produce (Álvarez, 2004: 78). Thus the cooperatives' autonomy was effectively restricted to 20 percent of their production (above state established quotas) which, in their first year they could not legally sell. Despite the stated objective to expand the cooperative sector in agriculture, at least in terms of the UBPCs, structural rigidities inhibited real decentralized decision-making and undermined possibilities for an empowered agricultural sector.

The initial results were very disappointing. Indeed, in his study on agricultural reform in Cuba, William Messina Jr. finds that agricultural reforms have been insufficient in so far as structural rigidities remain in place and have impeded the drive towards efficiency. (Messina, 2000: 437, 441) While it is true that even the partial achievements of the UBPCs are notable given the profound economic crisis (Burchardt, 2000: 5), it is significant that for the period 1994–2001 more than 50 percent of Cuba's UBPCs were operating at a deficit. (Álvarez, 2004b: 5) In fact, after a series of provincial meetings on the status of UBPCs in 2002, even Communist party officials concluded that most UBPCs were bankrupt. Indeed, as early as 1995 a study conducted by the *Polo Científico de Humanidades* at the University of Havana identified key problems with the UBPCs—lack of autonomy, inexperienced leadership, reluctant adoption of organic agricultural techniques, unstable labor force, lack of familiarity with notions of ownership, and lack of suitable housing—problems which persisted for nearly a decade. (Álvarez, 2004: 84–86) Yet Armando Nova of the University of Havana's *Centro de Estudio de la Economía Cubana* (Center for the Study of the Cuban Economy) stresses that UBPCs, in fact, experienced slow growth until 2001 when drought led to a slight decline in production for 2002 and 2003. (Nova, 2004: 11)⁶ Indeed, statistics from the *Dirección de Producción de Caña* (Sugar Production Centre) indicate that changes made⁷ have been successful—production per hectare has increased from 31.9 tons per hectare in 1993–1994 to 35.3 tons per hectare in 2003–2004. (Dirección de Producción de Caña, 2004: 6) Thus, though it appears that the initial failure of UBPCs to produce efficiently was a function of a paternalistic state unwilling to relinquish control in a meaningful way, in recent years there has been some increase in productivity. Because these increases in productivity are recent and have been impacted by environmental factors (i.e. drought and hurricanes), they require further monitoring. Nevertheless, it is fair to say that UBPCs are increasingly successful.

6. Best results in the last five years, for UBPCs, have been seen in the areas of rice production, citrus fruit, and pork (Nova, 2004: 11).

7. In 2002, the least productive cane fields and their mills, representing nearly 50 percent of Cuban land dedicated to sugar, were shut down in an effort to increase efficiency.

Agropecuarios, or Farmers' Markets

On September 23, 1994 the government reintroduced free market farmers' markets, this time called *agropecuarios*, with governmental decree No. 191/94 (Enríquez, 2000: 12), thereby granting a legal market for surplus production for both the UBPCs and the non-state sector. This move, in conjunction with the UPBCs, formed the basis of the third agrarian reform and has been credited with the alleviation of the food crisis. The internally contentious move to liberalize the prices of foodstuffs sold outside the ration channel (Koont, 2004: 5) had two primary objectives: to increase production through material incentives and to provide an alternative to (and competition for) the black market which had mushroomed out of control. Because the government had historically set prices very low (in order to keep food costs down and thereby facilitate massive food security) farmers, obligated to sell to the state, had felt little incentive to produce to capacity. (Sinclair and Thompson, 2001: 31) Once the *agropecuarios* were opened, both non-state sector farmers and state sector cooperatives were free to sell their excess produce to earn extra income. (Enríquez, 2000: 14) As we shall see below, this increased the level of control, effectively spurred production and has thereby provided more food for the population (Álvarez, 2001: 82). Indeed, in my own work in Cuba I have been to many cooperatives at which the average income is upwards of 800 pesos a month, nearly four times the national average peso income, thanks to sales at *agropecuarios*. Because prices at the *agropecuarios* were much lower than those on the black market,⁸ the *agropecuarios* both severely undercut black market sales and increased general access to food, thereby positively impacting food security.

While *agropecuarios* do not directly address the food needs of some of the most vulnerable sectors, there are some indirect benefits to the general population through taxation and the depreciation of the U.S. dollar vis á vis the Cuban peso. Though a preferential taxation policy has been instituted to stimulate food production and availability, especially in the hard-hit Havana area (Koont, 2004: 5), vendors' taxes are applied to reduce the government's budget deficit (Enríquez, 2001: 15), incurred through the provision of a vast array of social services. Also, once the *agropecuarios* were opened, both the value and the purchasing power of the peso improved. In 1994, as the black market skyrocketed, the exchange rate ranged from 80 to 140 pesos to the U.S. dollar. By 1995, however, it had fallen to 35 pesos to the dollar (Azicri, 2000: 143), by 1999 it dropped to 20 pesos to the dollar (Nieto and Delgado, 2001: 43), and since 2001 it has rested at between 26 and 27 pesos to the dollar (Álvarez, 2004: 102). Thus, despite high costs and differential access,

8. Pork, for example, sold for 25 pesos per pound at the *agropecuario* and 75 pesos per pound on the black market (Sinclair and Thompson, 2001: 28).

agropecuarios have managed to both alleviate the food security crisis for some and ameliorate the overall economic conditions on the island. Though the *agropecuarios* positively impacted food security, they were (and remain) contentious in Cuba, especially amongst staunch revolutionaries. An earlier experiment with farmers' markets in the mid-1980's, the *Mercados Libres Campesinos*, or the MLCs, had been terminated in 1986 because these markets were seen to promote inequality by providing extraordinary salaries for food producers and, especially, middlemen. Indeed, as recently as 1990 most policy-makers in Cuba viewed the MLCs in a wholly negative light. (Enríquez, 2000: 15) Yet the rafter emigration crisis of 1994 (Álvarez, 2004: 98), and the protests of 1994, prompted the government to reluctantly embrace this change as a means of remedying Cuba's desperate food crisis. (Enríquez, 2000: 15) The problem is that this remedy is still of limited access to much of the general population due to high costs. (Nieto and Delgado, 2001: 49) A pound of onions can run from 12 to 15 pesos, approximately 5 to 6 percent of the average monthly salary of 250 pesos. This would be tantamount to paying US\$48 for a pound of onions on a US\$800-a-month salary. Though the ration book does provide some basic foodstuff, monthly rations often last no more than 10 to 14 days. (Sinclair and Thompson, 2001: 28) The *agropecuarios* are therefore contentious because while they do offer food to Cubans with disposable income, they also engender differential access to foodstuffs in the marketplace.

Indeed, the *agropecuarios* have been hugely successful since their inception at increasing food access for some, though they have also contributed to the social cleavage effect. Within the first year, sales at the *agropecuarios* had reached over 20,000 tons of agricultural and meat products, representing 25 to 30 percent of total production sold to the population (Álvarez, 2004: 103), within their first year these markets began to supply between a quarter and a third of the Cuban population's total caloric intake. By 1999 the sales volume had tripled and the markets were generating more than 5 million pesos in taxes annually. (Peters 2000: 5) Clearly, these markets did much to increase food access for some. However, it is widely recognized that the prices of these markets are so high that they preclude the participation of many Cubans. (Álvarez, 2004: 101; Koont, 2005: 6; Messina, 2000: 441; Sinclair and Thompson, 2001: 28) Unfortunately, while this differential access runs contrary to the Cuban revolution's objective of equality, it is precisely the high cost of goods at the *agropecuarios* which engendered the material incentives that in turn spurred production. Indeed, Lucy Martin argues just this, explaining that "the ability to get higher prices and raise incomes by surpassing contracted production quotas has led to a more active and efficient management of productive resources, with one outcome being

the greater availability of food for the population.” (Martin, 2001: 65) In an effort to drive down the prices at the *agropecuarios*, the government opened agricultural markets with fixed maximum prices in 1999. While the quality, variety and consistency of the goods sold at these fixed price markets is relatively poor (Álvarez, 2004: 145-146), they do provide an alternative for those who cannot afford the *agropecuarios*. Unfortunately, because of the poor quality of the produce, they have not effectively generated competition and price reduction. It thus emerges that the *agropecuarios*, on the one hand, increased both production and availability of foodstuffs and, on the other hand, generated differential access under the revolutionary government for the first time.⁹

Urban Agriculture (UA)

Prior to the advent of the *agropecuarios*, citizens faced with the profound food crisis began to develop their own response to the severe shortages. As Catherine Murphy, a specialist in UA in Cuba, writes, “urban gardens sprang up all over Havana...on balconies, patios, and rooftops.” (Murphy, 1999: 12) Indeed, what had previously been both prohibited by the government and seen as a sign of poverty and underdevelopment (Henn, 2001: 15), now flourished into a widespread movement which both alleviated food insecurity and garnered the government much international praise. In 1993 the Ministry of Agriculture (MINAGRI) restructured urban land use rights allow for urban agricultural gardens¹⁰ and in 1994 MINAGRI created an agricultural department for the city of Havana which, in turn, developed an Urban Agriculture Department (Murphy, 1999: 12-13). The goal of this movement is to maximize produce production “from every patch of previously unused urban land” (Companioni et al., 2001: 220) by granting land access to would-be gardeners through usufruct—the land remains under the control of the gardener as long as the land remains under cultivation. (Bourque and Cañizares, 2000: 3) Urban Agriculture emerged as a uniquely grassroots movement and flourished as a result of government support.

Once government support was in place to secure land rights for urban gardeners, UA developed along three branches: small urban plots, organization specific plots, and peri-urban farms. Small urban plots produce in *huertos populares* (popular gardens), *organopónicos*, and *huertos intensivos*; the

9. This system, however, may be on the brink of transformation. In late 2005, as part of the battle against corruption, the government began to restrict the movement of illegal middlemen who (like the transporters in the *Mercados Libres Campesinos* of the early 1980's) would transport foodstuffs from farm to market, substantially marking up prices. The initial impact was a reduction of goods available at the *agropecuarios* for several days. Though availability of foodstuffs at *agropecuarios* does appear to have returned to normal levels, the long-term consequences of this move are not yet known.

10. Previously only ornamentals were permitted in visible urban settings (Murphy, 1999:

organization specific plots or *autoconsumos* are discussed below; and peri-urban farms are comparatively large, covering 2 to 15 hectares (Companiononi et al., 2001: 227), forming a greenbelt around metropolitan Havana. (Murphy, 1999: 21) The small urban plots in Cuba's UA are of particular interest in so far as it is with this type of agriculture that Cuban cities, especially Havana, have managed to transform every imaginable type of idle land into fruitful land, literally. The term *huertos populares* refers to the above-mentioned patio, balcony and rooftop gardens that began to appear at the very onset of the crisis. *Huertos populares* have become so common that they now make significant contributions to urban food security (Companiononi et al., 2001: 227-228). Both *organopónicos* and *huertos intensivos* are urban gardening techniques which are designed to augment the poor soil quality found in the converted vacant lots. *Organopónicos* use raised container beds filled with a high compost to soil ratio for the intensive planting of fresh vegetables. (Murphy, 1999: 19) This method is particularly useful in areas with extremely poor soil quality and can even be built on artificial surfaces. (Companiononi et al., 2001: 226) Similarly, *huertos intensivos* use raised beds for intensive gardening of fresh produce (Koont, 2004: 3), though this method is used where soil quality is higher. The essential component of both methods is their intercropping for intensive use of small areas so as to maximize production.

Because most of those involved in UA had no previous agricultural experience and nearly all had no experience in low-input agriculture, horticultural groups were formed throughout the island. These groups initially emerged at a grassroots level for members to pool resources and share information. (Chaplowe, 1996: 3) As the UA movement took hold, extension workers from the newly formed Urban Agriculture Division began running educational workshops to facilitate organic agriculture. (Murphy, 1999: 17) Today there are over 70 *tiendas de consultorio agrícola* or seed houses all over Havana which offer information guides, tools, seeds and advice to urban agriculturists. (Koont, 2004: 6) Using intercropping, household compost and vermiculture, "garden productivity has been achieved with minimal external inputs, applying principles of organic agriculture that are low cost, readily available, and environmentally sustainable." (Chaplowe, 1996: 2) As one of the few truly grassroots movements in contemporary Cuba, UA has made a significant impact on urban food security without depending on scarce agricultural inputs or transportation. Indeed, this empowered, sustainable, ecological, grassroots movement is renowned amongst food security theorists the world over.

Though it is undeniable that Cuban UA has been successful, production statistics vary. Catherine Murphy reports that in 1997 over 160,000 tons of

food were produced in UA (Murphy, 1999: 24), and Nieto and Delgado report that by 1999 the figure had increased to 800,000 tons of food produced in the urban sector alone. (Nieto and Delgado, 2001: 45) By 2000, reports indicate that UA was providing nearly 30 percent of caloric intake in urban areas. (Bourque and Cañizares, 2000: 6; and Offenheiser, 2000: 5) While early reports are consistent and show steady growth, reports in the last few years begin to show inconsistencies. For 2001 Sinclair and Thompson describe UA as providing 50 percent of the produce consumed in Cuba (Sinclair and Thompson, 2001: 24), while Egidio Paez, then-president of the Association of Agricultural and Forestry Professionals (ACTAF), claimed in a personal communication that 90 percent of all produce consumed in Havana is produced within the city limits. (Companiononi et al., 2001: 235) The latter figure is reflected in Jon Lamb's report that by 2002 UA produced 3.4 million tons of produce nationally, providing 90 percent of all produce consumed in Havana. (Lamb, 2005: 2) Most recent reports note that 4 million tons of produce were produced in the urban sector in 2004 and that figures for 2005 are expected to exceed that amount by 100,000 tons. (Bosch, 2005: 1) Despite some inconsistencies, statistics for urban agriculture reflect steady growth and a significant contribution to urban food security.

Urban Agriculture has contributed to increased access to organically produced produce. In part, UA is guaranteed to increase access to a variety of sectors of the population through direct participation in production and through contributions to local schools and hospitals. While contributions to hospitals and schools are technically voluntary, it is in effect required by local governments as a form of social rent in return for granting free access to land (Koont, 2005: 6). Furthermore, because the city of Havana passed a law prohibiting the use of chemical pesticides within the city limits, Havana's UA has become the most completely organic sector in Cuban agriculture (Murphy, 1999: 27). Cuba's UA program has effectively increased food security while expanding ecological approaches to agriculture.

Low Input Sustainable Agriculture (LISA)

Cuba has also won a great deal of international support for the national conversion to LISA which took place as a direct response to the unavailability of inputs at the onset of the Special Period. Indeed, Cuba's conversion to sustainable agriculture has been enthusiastically referred to as "a unique event, both on the world scene and in the history of socialism" (Levins, 1993: 52) "because this was the first case in the world where a whole country turned to low-input agriculture." (Perfecto, 1994: 98) It is fair to say that this is the "largest scale conversion from conventional agriculture to organic or semi-organic farming in history." (Rosset and Benjamin, 1994: 34) Moreover, it "has been easier for Cuban farmers than in other countries because of the

security bestowed by the Cuban government” such as land rights, secure markets, health care and education. (Álvarez, M.D., 2001: 85) In other words, the first ever national conversion to LISA has been possible due to Cuba’s unique social and political context—the government has been both willing and able to facilitate this conversion.

While an organic or LISA movement had existed in Cuba long before the crisis hit,¹¹ these farmers and scientists were generally marginalized by the established scientists who believed strongly in the chemically intensive pesticide model (Rosset and Benjamin, 1994: 28). Nevertheless, once the government elected to make low input agriculture national policy, they quickly took the reins of the movement. This was in the wake of the foundation of the formative group of the Cuban Organic Farming Association (ACAO), a group of independent farmers, agriculturists, scientists and proponents from abroad which formed in 1992 to promote and support the dissemination of low input farming approaches (Funes et al, 2001: 11). Of course, as this autonomous group gained national support and began to win international awards, it was subsumed as a section of the Cuban Association of Agricultural and Forestry Professionals (ACTAF) and renamed the Organic Farming Group (GAO) in April of 1999 (Funes et al, 2001: 14-15). While this is generally presented rather innocuously, it is an example of the tight control of the Cuban state.¹² Thus with the move from marginalization to official policy, the Cuban sustainable agriculture movement traded autonomy for state control.

In trading autonomy for state control, Cuba’s LISA movement has had the opportunity to become the largest organic experiment in the hemisphere. (Sinclair and Thompson, 2001: 25) Indeed, “Cuba has pioneered the use and propagation of generalist ants to control insect pests in annual and semi-perennial crops” (Perfecto, 1994: 99), has developed massive vermiculture composting networks, and has reverted to animal traction. (Perfecto, 1994: 102) Because with only 2 percent of the population of Latin America, Cuba has approximately 11 percent of the scientists (Rosset and Benjamin 1994, 28), Cuban scientists, backed by the Cuban government, are able to generate new ecological technology at a rapid rate. (Perfecto, 1994: 103) Cuba’s alternative agricultural model favors diversity over monoculture, biofertilizers over chemical ones, biopesticides over chemical ones, animal traction over mechanization, and rainfall over irrigation. (Rosset and Benjamin, 1994: 29) Cuba is indeed uniquely poised for such a transition, both because of the

11. Proponents cite dates ranging from the 1970’s when some scientists began to be interested (Funes, 2001: 11), to 1982 when policy began to favor local technology (Rosset and Benjamin, 1994: 27), to the late 1980’s when policy implementation began (Levins, 1993: 58).

12. Indeed, many of my Cuban colleagues continue to refer to this as a prime example of the disempowering effect of the Cuban government’s paternalism.

security bestowed by the government and because of the government's absolute control over planning.

Cuba is renowned for its low input approach to agriculture in both urban and rural zones. Indeed, proponents are right to call this project "startlingly successful" (Barclay, 2003: 1), given that statistics for 2003 reveal that Cuba was using only 50 percent of the fuel, less than 10 percent of the chemical fertilizers, and a mere 7 percent of the synthetic insecticides it had used in 1989. (Lamb, 2005: 2) This drastic shift has been possible both because of full government support and a high concentration of scientists. Three elements of the organic agriculture program have proven particularly successful—the approach to biological control agents, production of compost, and use of animal traction. Beginning with a few centers in 1988, by 1992 the government had opened 218 Centers for the Production of Entomophages and Entomopathogens (CREEs). These on-site centers supply the pest control needs of entire cooperatives or farming communities, essentially producing modern biotechnology on a local scale. (Rosset and Benjamin, 1994: 41; and Koont, 2005: 4) Compost production in Cuba ranges from organic amendments and biofertilizers to green manures and worm hummus, and all statistics indicate impressive growth. (Sinclair and Thompson, 2001: 26-27) In fact, in one year, 2001 to 2002, output increased seven-fold, and by 2003, 15 million tons of compost were produced. (Koont, 2005: 4) Finally, the use of animal traction has both cut down on soil erosion and been overwhelmingly successful in reducing the reliance on fuel for agriculture.

Proponents of Cuba's agricultural conversion often point out that "Cuba is ideally situated to demonstrate the full possibilities of organic farming and to truly achieve sustainable agricultural systems" (Funes, 2001: 22) because of Cuba's social and political landscape. Indeed, Cuba's Organic Agriculture Group (GAO) was awarded the Right Livelihood Award in 1999 (Mittal, 1999: 1)¹³ for facilitating the national conversion to low input agriculture. Cuba's conversion to LISA has certainly been tremendously successful and has given proponents of organic agriculture around the world a real world example. Yet the pursuit of sustainable farming practices was a pragmatic response to a food crisis, not an end in itself. In fact, many saw sustainable practices as a transitory ill of the Special Period and even in the depths of the crisis, from 1990 to 1996, Cuba was investing approximately US\$50 million in biotechnology annually. (Lehmann, 2000: 2) Significantly, the ideal is not organic agriculture but rather national food security—and public interest in organic agriculture or concern about genetically modified organisms (GMOs) is negligible (Lehmann, 2000: 5-6). Thus, while Cuba has effectively

13. The Right Livelihood Award is usually referred to as the Alternative Nobel Prize, is widely recognized, and is quite an honor.

employed LISA on a national scale for over a decade, it is important to view this practice in context and to bear the pragmatism of the Cuban government in mind. Indeed it is important to note the government's selective emphasis of facets of the program, depending on the interests of the audience.¹⁴

Conclusion

The collapse of the socialist bloc,¹⁵ the tightening of the U.S. embargo, and inefficiencies in the Cuban system all coalesced to produce the crisis of the early 1990s, and every aspect of every Cuban's life was affected. The collapse of the Soviet Union and Eastern European Socialism was, indeed the spark that instigated the crisis—those former partners had represented nearly all of Cuba's trade. The tightening of the U.S. blockade was designed to set in motion the downfall of the Castro government. While it failed to achieve its objective, it was widely condemned by important U.S. trading partners and it also had devastating consequences on the lives of ordinary Cuban citizens. Yet it is the role of the Cuban government, often overlooked, which provides the space for empowered action. A critique of Cuba's dependent and inefficient state sector is essential not because it lays blame on the Cuban government, but rather because it is an internal factor which Cuba has the power to change. It is therefore critical to recognize that there were three factors, not two, which contributed to the crisis of the early 1990s—the demise of Soviet socialism, the strengthening of the U.S. blockade, and a largely dependent and inefficient state sector.

When the effects of these three factors were felt in Cuba, agriculture came to a halt, food security eroded. By 1994 agricultural production levels had fallen to 55 percent of their 1990 levels and, for lack of transport, much of what was produced rotted before it reached the ration stores. Fortunately, the government's absolute dedication to equal access meant that extant resources were shared with remarkable equity. Nevertheless, there were severe health consequences and the average adult lost 20 pounds. In this time of extreme scarcity, there were those who capitalized on the situation fueling the black market and forcing inflation rates to skyrocket up to 1000 percent. The

14. During my time as an intern with ACTAF, I worked at the main office and demonstration site of ACTAF Havana. We frequently received visitors in tour groups or individually—groups such as Global Exchange, Food First's Peter Rosset, and then-Agriculture Minister of South Africa, Thuko Didiza. Assisting with translation, my colleague and I became quickly aware that the emphasis of the presentation—either organic agriculture or biotechnology—shifted in response to the ideological preference of the audience. Therefore, the relatively sparse literature on Cuban biotechnology can be understood, essentially, in terms of the interests of Cuba scholars.

15. Recall that in 1989, 85 percent of Cuba's international trade was with the Soviet Union and the socialist bloc (HIA, 1998: 206).

depths of the crisis are almost unimaginable and have left an indelible mark on the consciousness of all Cubans and on Cuban society.

The government was drastic in its response and quickly amended the constitution to allow for a degree of liberalization and a total restructuring of the agricultural sector. Based on the relative success of Cuban agricultural production cooperatives or CPAs, the predominant and inefficient state sector was rapidly broken down into basic units of cooperative production or UBPCs. In addition, the private sale of surplus foodstuffs was legalized both as an incentive for production and to counter the black market. The government also tapped into a grassroots surge in urban gardening, providing free access to land through usufruct rights and facilitating an extensive network of urban agriculture or UA. Furthermore, out of pure necessity, the government turned to its own organic farming movement to lead Cuba in the world's first ever national experiment in Low Input Sustainable Agriculture or LISA. The state was quick to respond and radically redirected agriculture with the formation of the UBPCs, the re-opening of contentious farmers' markets or *agropecuarios*, support for a burgeoning urban agriculture movement, a massive transition to LISA, and new emphasis on existing strategies for efficiency.

Cuba was powerless to change the fact that they had lost their trading partners or that the strangle-hold of the embargo was nearly suffocating, yet the island was able to make changes within its own borders and did so with radical fervor. Nevertheless, state paternalism remains present in this transformed agricultural landscape and, despite a relatively high level of decentralization (by Cuban standards), a prohibitively high level of centralization has impeded the productivity of the UBPCs. It appears that the Cuban government is radical, within a particular framework.

Though the Special Period is not officially over, Cuba has doubtlessly emerged from the depths of the crisis felt in 1993. But the Cuba that emerges is quite different from the Cuba of the revolutionary era and, while social indicators remain high, it is precisely the measures which have carried the island through the crisis that have reintroduced social differentiation. Indeed, the impacts of the radical redirection in agriculture were most notable in the case of the *agropecuarios* where the high cost of goods (which generated differential access to foodstuffs) actually provided the material incentive for increased production. Ultimately, the undeniable success of Cuba's UA and the Cuban government's pragmatic conversion to Low Input Sustainable Agriculture speak to the importance of a government's will to prioritize food security. These two strategies are effective, inexpensive, community-based initiatives which require little more than the protection of their local government, though UA does enjoy massive support from NGOs and aid agencies around the world. Perhaps the most important action of the Cuban govern-

ment was the decision to prioritize food security above all else (Azicri, 2000: 144) in a time of severe economic crisis.

The crisis of the early 1990's rocked the nation and, by some accounts, came close to bringing about the downfall of the revolution. Ever pragmatic, the Cuban government took great steps to guarantee food security, protect social gains and restructure both state and society. While the state of Cuban food security over the last decade and a half is not without severe problems, the government's dedication to guaranteeing the human right to food is both unique and impressive, and has justifiably garnered support within the island and around the world.

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