The Cuban Sugar Economy: Collapse, Reform and Prospects for Recovery*

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Abstract. The collapse of Cuba's import-intensive sugar economy in the 1990s is analysed in the context of the disintegration of COMECON and of the USSR. Salient features of post-revolutionary cane farming are contrasted with those of the 1950s. Falling production in the 1990s, and the main institutional responses to it, are compared with those of the Great Depression of the 1930s. The analysis is illustrated with primary data collected in fieldwork carried out in 1994 and before. The complexities of current 'technical regression' from more to less import-intensive agricultural practices are outlined and the impact of acute national investment constraints upon the recovery prospects of the sugar economy are appraised.

The dissolution of COMECON, the Soviet-led trade bloc, and the disintegration of the USSR itself have had a devastating effect on the Cuban economy, comparable to the worst years of the Great Depression of the 1930s. In both cases, the island was plunged into crisis by the collapse of its foreign trade. Between 1925–9 and 1930–4, Cuban export values fell by 63.5 per cent and imports by 67.9 per cent.[1] Between 1985–9 and 1991–5, average annual exports slid from 5.5 to 1.7 billion pesos and imports from 7.8 to 2.5 billion pesos (at the official rate of exchange, 1 peso = US$1). From their peak of 8.1 billion pesos – around 40 per cent of gross domestic product – in 1989 to their trough of 2.0 billion pesos in 1994, imports fell by 76 per cent.[2] In the 1990s as in the 1930s, Cuba's economy foundered on the changed fortunes of one commodity – sugar.

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[1] Cuban sugar and total exports, 1925–34, from *Anuario Azucarero de Cuba* (A.A.C.) (Havana, 1951), pp. 104, 107; sugar production from M. Moreno Fraginals, *El Ingenio*, vol. III, Table III, pp. 47–9 (Havana, 1978).

[2] Data for 1985–9 from *Anuario Estadístico de Cuba* (A.E.C.) (Havana, 1989), Table XI.1, p. 246. Figures for 1991–5 from Banco Nacional de Cuba (B.N.C.), *Economic Report 1994* (Havana, August 1995), p. 11.

Between 1925–9 and 1930–4, sugar industry exports, representing roughly 80 per cent of total exports, fell by 67.7 per cent in value, and average annual sugar production by 38.4 per cent, from 4.9 to 3.0 million tonnes. In 1985–9, sugar and related products accounted for 74.7 per cent of total Cuban exports, averaging more than 4.1 billion pesos. By 1995, sugar's share in total exports had declined to an estimated 50.3 per cent.[3] Sugar production fell from 7.6 million tonnes annually in 1985–9 to 5.2 million tonnes in 1991–5.[4] However, these averages mask a more abrupt and deeper downturn: whereas the three harvests ended in 1990–2 held at roughly the 1985–9 level, the 1992/3–1994/5 crops plunged to an average of 3.8 million tonnes. The year-on-year drop of 40 per cent from 1992 to 1993, from 7.0 to 4.2 million tonnes, was unprecedented in modern Cuban history. Unlike the 1990s, the descent in Cuban sugar output from 5.4 million tonnes in 1929 to 2.1 million tonnes in 1932 was triggered entirely by the shrinkage of foreign sugar outlets and plummeting prices, rather than production problems. A prohibitive increase in already-high United States import tariffs in 1930 reduced Cuban access to a market that had absorbed more than three quarters of total sugar exports in the years 1925–9. On the London (world) sugar market, meanwhile, average prices had fallen by 38.4 per cent between 1927 and 1929. In the next three years, they declined by a further 56.9 per cent.[5] Cuban sugar mills were closed and output slashed in the face of mounting losses.

A halting recovery of the economy began in 1934, accompanied by major reforms in the organisation and marketing of Cuban sugar. Reduced, but more stable, Cuban access to the US market was institutionalised. Disregarding actual production capabilities, overseas suppliers received quotas based on their performance in the previous three years, to the benefit of Hawaii, the Philippines and Puerto Rico, which had not been affected by the 1930 tariff hike, and the detriment of Cuba, which had been. In return, Cuba adopted an analogous domestic system of production quotas. This protected the numerous smaller and older Cuban-owned factories and cane growers by limiting potential production of their larger, more modern US-owned rivals. The end of the Depression actually saw Cuban interests in the island's sugar economy more strongly entrenched than had seemed possible at the outset.[6]

[3] A.E.C. (1989), Table XI.5, p. 260; Banco Nacional de Cuba, *Economic Report 1994*, p. 12.

[4] A.E.C. (1989), Table VI.3, p. 148; Banco Nacional de Cuba, *Economic Report 1994*, p. 8.

[5] R. Guerra y Sánchez, *La Industria Azucarera de Cuba* (Havana, 1940), Table XXVIII, p. 243.

[6] See B. H. Pollitt, 'The Cuban Sugar Economy and the Great Depression', *Bulletin of Latin American Research*, vol. 3, no. 2 (1984), pp. 3–28.

The impact of external market conditions on the sugar economy of the 1990s is more complex, and the effects of current industry reforms are still unclear. Some technical and organisational changes are too recent to be evaluated. Large gaps in the official data on the evolution of the national and sugar economies after 1989 hamper the task of appraisal and render most conclusions tentative.[7] Cuba supplies figures on sugar production, exports, consumption, and stocks to the International Sugar Organisation, an intergovernmental body, but much additional information needed to evaluate the performance of Cuba's sugar industry after 1989 is unavailable. The present paper combines data from fieldwork with such statistics as have occasionally been given by Cuban authorities. To these are added the very limited national data supplied to the author in 1994 by the Cuban sugar ministry (MINAZ), together with material culled from the sparse technical literature lately available for consultation in that ministry.[8]

Cuban sugar production in the 1950s and 1980s

The domestic ramifications of external events are made more intricate than they were in the 1930s by the greater complexity of production conditions since the 1959 Revolution. Table 1 compares indicators of agricultural and industrial performance in the decades 1950–9 and 1980–9. Overall, sugar production increased by roughly a third from some 5.6 to 7.5 million tonnes, and cane yield from 40 to 54 tonnes per hectare harvested. Harvesting and milling periods were substantially extended. The industrial yield, in contrast, fell by almost 15 per cent, from 12.75 to 10.88 tonnes of sugar per 100 tonnes of cane ground.

[7] From the mid-1970s, the Cuban State Committee of Statistics (CEE) published the *Anuario Estadístico de Cuba* (AEC). In the course of time, this provided, within the definitions then employed in Soviet-style economies, most data necessary to assess Cuba's social and economic performance. Sections on the sugar economy offered an insight into various technical aspects, and its significance in Cuban exports, and to a less clear extent in imports, was shown in the sections on foreign trade. However, after 1989 the CEE was prohibited from publishing the basic economic data previously made available in the AEC. Ministries contributing such data to the CEE were similarly gagged. Consequently, it is at present impossible to document Cuba's economic performance by means of various statistical indicators available up to 1989.

[8] For a while, the Dirección de Planificación of MINAZ compiled an *Anuario Estadístico del Ministerio del Azúcar* (A.E.M.A.), as the ministry's basic internal statistical handbook. It was short-lived, and its final 363-page edition for 1990 was published in June 1991. Several information bulletins circulated by MINAZ closed down after 1991 because of paper shortages and, for the same reason, none of the six main technical publications on the sugar industry that formally survive, including *La Industria Azucarera* and *Cuba Azúcar*, has appeared since April 1992. Technical data previously made available to and published by this writer were withheld by MINAZ in 1994, though said to be not officially regarded as classified.

Table 1. *Cuban sugar industry performance indicators, 1950–9 and 1980–9*

Crop year	Sugar produced (1000 tonnes 96° basis)[a]	Harvest days[b]	Milling days[c]	Agricultural yield[d]	Industrial yield[e]
1950	5,621	100	87	35.9	13.06
1951	5,821	105	93	35.5	12.89
1952	7,298	130	115	41.8	12.19
1953	5,224	94	83	40.4	12.75
1954	4,959	90	80	41.0	12.62
1955	4,598	76	68	41.7	13.21
1956	4,807	87	72	37.2	12.91
1957	5,742	93	82	36.1	12.78
1958	5,863	109	86	43.6	12.62
1959	6,037	103	87	45.0	12.47
1980	6,665	149	109	46.0	10.82
1981	7,359	136	114	55.1	11.08
1982	8,210	152	124	55.1	11.17
1983	7,109	160	113	58.0	10.35
1984	8,207	166	126	57.4	10.47
1985	8,004	135	103	50.0	11.99
1986	7,255	137	104	51.6	10.62
1987	7,117	141	99	52.1	10.64
1988	7,415	128	100	56.8	10.85
1989	8,121	145	109	60.0	10.83

[a] Sugar statistics should not be interpreted too closely. The method used in Cuba to convert physical raw sugars into the 96° standard generates, at the average polarisation of Cuban raws reported in recent years, values about 2.5 per cent lower than the formula of the International Sugar Organisation. Discrepancies between different Cuban publications can be found in other series, but do not alter the trends discussed here.

[b] Total length of the harvest from beginning to end.

[c] Length of time in days in which mills are actually grinding.

[d] Tonnes of cane per hectare harvested.

[e] Sugar, basis 96°, as per cent of cane.

Sources: 1950–9, *Anuario Azucarero de Cuba*, various years; 1980–9, *Anuario Estadístico de Cuba*, various years.

By international standards, pre-revolutionary Cuba had relatively low cane yields. The relatively high sugar content of its cane and efficient processing, on the other hand, boosted its position in terms of sugar produced per tonne of cane ground. In contrast, better cane yields in the 1980s were largely offset by a fall in the sugar-to-cane ratio. Pre- and post-revolutionary yield comparisons are not that simple, however, as the data refer to the area harvested and not the total area planted to cane. Part of the cane area normally remains uncut at the end of one season, to be harvested in the next. Varying this proportion affects the average age and yield of harvested cane, and changes in the tonnage per hectare harvested

may flow from changes in harvesting practices rather than in the productivity of the total land under cane. Other measurement problems may also affect the comparability of reported yields over time.[9] Keeping these reservations in mind, the low pre-revolutionary cane yields mainly reflect scant use of artificial fertilisers and irrigation, and lack of new high-yield cane varieties, in that era. According to the National Agricultural Census of 1946, just 12 per cent of farms applied fertiliser to only 7.4 per cent of the total cultivated area in 1945, mostly to tobacco, citrus fruits and food crops.[10] Irrigation was even more limited, used only by four per cent of farms, again mainly tobacco and food crop growers.[11]

Use of fertilisers and irrigation increased notably between 1946 and 1958, but for most large cane growers was not indispensable. From the mid-1920s onward, demand, not supply constraints, governed the output of the Cuban sugar industry. Unlike producers where land was scarce, such as Hawaii, Cuba possessed large reserves of land suitable for cane but used mainly for extensive pasture. Production could easily be increased to meet greater demand by ploughing up idle land or replanting low-yielding ratoon fields. When demand was depressed, on the other hand, planting rates could be cut back and old ratoons abandoned.[12] Factory yields in pre-revolutionary Cuba reflected competent industrial processing of high-quality raw material. Sugar factories can extract a high percentage of the sucrose in cane when it is delivered clean, mature and freshly cut. All cane was cut and loaded by hand in Cuba in the 1950s. Together with tight quality control, this ensured that millable (useful) cane stalks entered the factory with no more than about two per cent of extraneous matter (EM). Concentrating the harvest in the dry months of January to April facilitated scheduling, since a limited range of cane varieties was cut and ground close to their peak maturity in terms of sucrose content. The cane haulage systems then employed blended the use of oxen, transhipment cranes, railroads, trucks and tractor-drawn trailers, and delivered the cane to the factories sufficiently promptly as to avoid the significant sucrose losses caused by excessive delays between cutting and grinding.

The improvement of cane yields in the 1980s, compared with the 1950s,

[9] For example, harvested cane may be reported as clean or including extraneous matter (EM). Since machine-harvested cane may contain as much as 15 per cent EM, it is clearly important whether field yield figures include EM or not. As mechanised harvesting expanded in post-revolutionary Cuba, reporting standards for clean cane were introduced, but for a number of years the data were not wholly consistent.

[10] *Censo Agrícola de 1946* (C.A.N.), pp. 122–5.

[11] *Ibid.*, pp. 118–21.

[12] Cane can be cut over several years, and plantations consist of new (or plant) cane and ratoons. The latter are classified by the number of times they have been cut as first, second, third ratoons, etc., and their yield tends to decline with age. Plant cane entails substantially higher expenses than ratoons, at least per land unit, since it requires soil preparation and sowing as well as more cultivation.

owes much to greater use of irrigation and fertilisers. Irrigation increased from perhaps five per cent of the area under cane in the 1950s to about 20 per cent in the 1980s.[13] Fertiliser application increased significantly in the later 1950s, but average annual usage over the decade does not seem to have exceeded 50,000–75,000 tonnes.[14] By the 1980s, 70–75 per cent of the area under cane is reported to have been fertilised, absorbing about 800,000 tonnes of imported fertiliser, out of total imports averaging about 1.2 million tonnes a year.[15] The increases in cane yield between the 1950s and the 1980s were not uniform throughout the country, being greater in the western parts than in the more sparsely populated and less intensively cultivated central and eastern regions.[16] Industrial yields declined in the post-revolutionary period primarily because of the poorer quality of the cane delivered to the mills. One reason for this was the increased length of post-revolutionary harvests. This allowed fuller utilisation of plant, equipment and labour and was an important factor underpinning the growth in sugar production. Against this, earlier starts meant grinding less mature cane, and later finishes ran into the rainy season. The effects were only partly mitigated by the introduction of early and late maturing varieties. Figures for six of the eight harvests between 1984 and 1991 showed that the industrial yield rose from 9.1 per cent in December to 11.58 per cent in March and then fell back again to 10.04 in May. The average of 10.82 per cent was substantially below 1950s yields.[17] It was also significantly less than would have been achieved in the 1980s with smaller crops harvested in less time.

Cane quality was also adversely affected by the massive growth of mechanical harvesting after the Revolution.[18] Table 2 shows that the proportion of machine-cut cane rose from 45 per cent in 1979/80 to 71 per cent in 1989/90. When cutting green (unburnt) cane, chopper harvesters typically delivered cane with about 12–13 per cent EM. Burning the cane before cutting lowered the EM and increased the productivity of both

[13] The 1950s figure is my estimate. For the 1980s, see AEC (1989), VIII.8, p. 187.

[14] Fertiliser application to cane reportedly rose from 24,700 short tons in 1954 to 122,000 tons in 1956. See A.A.C. (1957), p. 135. M. A. Figueras estimates annual applications of 150–200 thousand tonnes over 1955–9. See M. Figueras, *Aspectos Estructurales de la Economía Cubana*, Ciencias Sociales (Havana, 1994), p. 83.

[15] For the cane area fertilised, see 'Principales Atenciones Culturales Realizadas a la Caña de Azúcar en Año Calendario', AEC, various years. For fertiliser imports, see 'Importaciones de Productos Seleccionados', *ibid*. For tonnage applied to cane, see F. Castro, *Granma*, 28 Dec. 1993.

[16] Pedro Pablo Acosta, 'La Industria Azucarera en Cuba en los Ultimos 40 Años', MINAZ (May 1993), p. 4 and Table 7.

[17] *Ibid.*, Table 5.

[18] For a more detailed examination of the development of mechanised cane harvesting in post-revolutionary Cuba, see B. H. Pollitt and G. B. Hagelberg, 'The Cuban Sugar Economy in the Soviet Era and After', *Cambridge Journal of Economics*, vol. 18 (1994), pp. 547–69.

Table 2. *Cuban sugar cane harvests, 1979/80 to 1989/90*

Crop	Cane ground (million tonnes)	Cut by chopper harvester (%)	Burnt cane (%)	Passed through cleaning stations (%)	Extraneous matter entering factory (%)
1979/80	61.6	45	50	46	7.9
1980/81	66.4	47	43	47	6.3
1981/82	73.5	50	39	52	5.7
1982/83	68.7	52	31	56	6.0
1983/84	78.4	58	33	62	6.2
1984/85	66.8	62	30	69	6.2
1985/86	68.3	64	28	72	6.6
1986/87	66.9	63	24	76	7.2
1987/88	68.4	67	20	78	6.9
1988/89	75.0	68	17	82	6.4
1989/90	74.8	71	14	85	6.6

Source: MINAZ, *Memorias*, various years.

men and machines, but severe adverse side-effects prompted a reduction of burning after the mid-1970s.[19] Cane cleaning stations processed 85 per cent of the crop by 1989/90, reflecting the efforts made to keep down the amount of EM entering the factories. As can be seen in Table 2, the percentage of EM delivered to the mills did not change significantly in the 1980s, despite increasing mechanisation and less pre-harvest burning – trends tending to produce more EM. Even so, EM levels of 6–7 per cent were three times as high as those in the 1950s and had a negative effect on factory yields.

Harvest mechanisation lowered cane quality in still other ways. As their name implies, chopper harvesters chop the cane into billets which then pass through blasts of air to remove trash before being loaded onto infield vehicles. The billets are again processed in the cleaning stations before shipment by rail or road to the mill. At each stage, some sucrose is lost. Besides, chopped cane deteriorates more quickly than wholestalk cane, as does burnt cane compared with green cane.

Finally, a comparison of the pre- and post-revolutionary performance of a number of sugar factories suggested that industrial efficiency may have been affected by a fall in technical and administrative skills. About a sixth of the record harvest of 1952 was produced by 11 factories on Cuba's northern coast. A review of six harvests between 1984 and 1991, when national sugar production exceeded 1952 levels, showed that this group of factories ground 10 per cent less cane, obtained 18 per cent less

[19] Burning destroys organic matter that serves as mulch, preventing erosion, conserving soil humidity and suppressing weeds. Without irrigation and increased application of herbicides and fertiliser, trash destruction could depress subsequent ratoon yields.

sugar per tonne of cane ground, and overall produced 26 per cent less sugar than in 1952. Mechanised harvesting in wet weather was thought to be the principal reason for the worse performance. The point was also made, however, that pre-revolutionary factory staff enjoyed special living and salary conditions in compensation for the unpleasant natural environment and social isolation of this coastal belt. Large numbers of staff left these factories for other jobs in Cuba and overseas from 1960 on and were not replaced by equally skilled management teams.[20] Care is needed, however, when comparing managerial competence in the pre- and post-revolutionary sugar industry. In the 1950s, sugar factories contracted the bulk of their cane supply from independent growers (*colonos*). Harvesting schedules were carefully coordinated to conform with the needs of the factories, but management of field operations was for the most part decentralised.[21] Smaller and shorter harvests not only meant higher factory yields, but also less wear on equipment and fewer breakdowns. By the 1980s, field and factory operations were integrated into so-called Agro-Industrial Complexes (CAIs) under one management. Mechanised field operations demanded the efficient deployment of teams of skilled workers in combination with expensive equipment dependent on adequate maintenance and logistical support. And with longer harvests, this extended into times of the year in which operations were more likely to be interrupted by rain.

In sum, higher cane yields resulting from greater use of fertiliser and irrigation after the Revolution were largely offset by lower industrial sugar ratios. A comparison of six harvests from 1984 to 1991 with the harvest of 1952 shows a six per cent rise in sugar production, but a 20 per cent increase in the amount of cane processed. Hence, though cane yields per hectare harvested increased by more than 13 per cent, the sugar yield rose only from 5.7 to 5.8 tonnes. The latter increase was due entirely to the sharply higher cane yields in the western provinces. In the central and eastern provinces, cane yields rose less, and the tonnage of sugar per hectare harvested actually fell, compared with 1952.[22] Increased field

[20] Acosta, 'La industria azucarera', pp. 3–4 and Table 6.

[21] No more than 10–15 per cent of the cane supply in the 1950s was so-called administration cane, i.e. produced on lands owned and managed by the sugar factory. In this respect Cuba's sugar industry did not then conform to the classical mill-plantation model.

[22] Pedro Pablo Acosta, 'La industria azucarera', Table 7. Comparisons between the 1980s and 1952 are illuminating, but it has to be noted that a series of harvests is being compared with a single exceptional one. The 1952 harvest was the largest before the Revolution and could not have been immediately repeated. With no production restrictions and excellent weather conditions, virtually the entire area under cane was harvested. Lack of cane held over from 1952 depressed the level of the potential harvest for 1953. In the event, this was cut back further in the face of a collapse in sugar prices.

mechanisation and longer harvests thus made possible the high and stable levels of total sugar production of the 1980s – but only at the cost of a substantial fall in the quality of the raw material.[23]

The sugar economy and COMECON

The post-revolutionary technological changes were import-intensive. To be sure, a growing national engineering industry manufactured a range of equipment and parts for the industrial side of the sugar sector.[24] It also helped to supply the needs of field mechanisation and cane transport.[25] But for the most part this merely added value to imported producer goods and did not altogether replace them. The fuels and lubricants required for the growing national machine park were mostly imported as well, as was the bulk of fertilisers and irrigation equipment. In consequence, the sugar industry became increasingly dependent on the timely flow of imports, whether of finished or intermediate products.

The Cuban government was, of course, aware of the import-intensive nature of the new sugar production technologies. COMECON countries, especially the USSR, paid premium prices for Cuban sugar and provided soft loans to finance machinery and raw material imports. Lower and more volatile world market sugar prices meant that goods tended to be imported from market economies only when unobtainable or of unacceptable quality in the socialist camp.[26] Much imported and domestically produced equipment was inferior by international standards, but better products could usually have been bought only on less advantageous terms of trade.[27]

[23] The deterioration of post-revolutionary cane sugar ratios is analysed in M. A. Figueras, 'Aspectos estructurales' and in A. E. Morales P., 'Desarrollo de la Agroindustria Cañero-Azucarera en el Período 1959–1991', mimeo. (Havana, May 1991).

[24] Several new sugar factories were built in Cuba in the 1980s to a standardised design. According to *Granma Weekly Review* (G.W.R.), 10 March 1985, 77 per cent of the value of their milling equipment was produced in Cuba, with a further 15 per cent imported from COMECON countries and 8 per cent from capitalist economies.

[25] From 1977, chopper harvesters were made or assembled in a Cuban factory which eventually produced over 600 machines a year. By 1981, 2,200 of the 2,500 components were reportedly manufactured in Cuba. See B. H. Pollitt, 'Sugar, "Dependency" and the Cuban Revolution', *Development and Change*, vol. 17, no. 2 (April 1986), p. 209.

[26] This strategy was more rigorously enforced as hard-currency debt repayment difficulties mounted in the early 1980s.

[27] For example, a number of Toft 6000 chopper harvesters, demonstrably superior to the KTP-2 machine of Cuban–Soviet design produced or assembled in Cuba, were imported from Australia in the 1980s. Production costs of the KTP-2 are unavailable, but it was sold in Cuba for between 50,000 and 55,000 pesos. The Toft 6000, on the other hand, reportedly cost US$180,000. This already impressive price discrepancy has to be further multiplied by a factor of about three because the import content of the KTP-2 was paid for by sugar sales to the USSR, whereas purchases of the Toft 6000 were ultimately financed by transactions on the far less profitable world sugar market.

Table 3. *Cuban sugar exports to selected countries, 1985/9–1993: volume (thousand tonnes, raw values) and percentages*

Countries	Years				
	Average 1985–9	1990	1991	1992	1993
USSR/CIS[a]					
Vol.	3,673.7	3,576.1	3,835.5	3,397.3	2,303.9
%	53.2	49.9	56.7	55.8	62.9
East European, COMECON					
Vol.	1,000.4	591.8	57.3	133.0	53.8
%	14.5	8.3	0.8	2.2	1.5
China					
Vol.	777.5	892.1	796.6	825.4	315.5
%	11.3	12.4	11.8	13.6	8.6
Rest of world					
Vol.	1,447.4	2,111.8	2,078.1	1.729.2	988.8
%	21.0	29.4	30.7	28.4	27.0
Total					
Vol.	6,899.0	7,171.8	6,767.5	6,084.9	3,662.0
%	100.0	100.0	100.0	100.0	100.0

[a] The Commonwealth Independent States (CIS) replaced the USSR after 1991.

Source: International Sugar Organisation.

Table 3 shows the crucial role played by COMECON countries in Cuba's sugar trade up to 1989. Together, the USSR and East European members on average absorbed more than two-thirds of total sugar exports in 1985–9. Even greater than their share in terms of volume was their share in terms of value. In 1989, COMECON premiums lifted the average unit value of Cuban sugar exports to all socialist countries to 642 pesos a tonne, three times the 214 pesos a tonne received on 1.5 million tonnes shipped to market economies.[28]

The dissolution of COMECON and the unification of Germany are reflected in the precipitous fall of Cuban sugar exports to Eastern Europe after 1989. There was no comparable immediate drop in the volume of exports to the USSR or its successors. Shipments to the former Soviet Union did not markedly decline until 1993, and then not because the market had disappeared but because Cuba had far less sugar to sell.

Cuba's sugar production and exports fell in tandem by close to 40 per cent between 1992 and 1993. Low stocks at the end of 1993 and an even worse harvest in 1994 ruled out any immediate export recovery. The scale of this decline bears comparison with that during the 1930s depression and

[28] See B. H. Pollitt and G. B. Hagelberg, 'The Cuban Sugar Economy in the Soviet Era', p. 565.

dwarfs the 1950s recession in international commodity markets. The difference is that in both earlier cases, production and exports were cut back in deliberate fashion to reduce the volume of sugar that would fetch unremunerative prices. The output collapse of the 1990s, in contrast, was forced by shortages of inputs for a more sophisticated, import-dependent system of production. The decay set in in 1991 and 1992, but was masked by the fact that sugar production held up at over 7 million tonnes and exports still averaged over 6 million tonnes.

The mechanisms of crisis in the sugar economy

The immediate problem was the reduction in Cuban sugar export earnings. This was not for want of buyers. Canada, Egypt, Japan, Libya, Mexico and Syria bought almost 700,000 tonnes more Cuban sugar in 1991 than in 1989, but these outlets paid world market prices. More importantly, exports to the former Soviet Union were worth far less. This is best illustrated by the terms of the carbohydrate/hydrocarbon exchange between the two parties: in 1987, one tonne of Cuban sugar bought 4.5 tonnes of Soviet crude oil and derivatives whereas under a barter deal with Russia in 1992, one tonne of sugar earned only 1.8 tonnes of oil. In 1992, Cuban sugar probably averaged only about half of the 550 pesos per tonne received in 1989, with total sugar export receipts falling from nearly 4 billion pesos to at most 1.5 billion pesos.

Lower sugar prices were not, however, the only factor in the collapse of the island's import capacity. Even under the Soviet-led system of preferential trade, Cuba's average annual foreign trade deficit had reached an unprecedented 2.3 billion pesos in 1985–9,[29] mostly with the USSR. One of the more calamitous effects of the changed relationship with the former Soviet Union was the elimination of the generous provisions for financing this deficit. The overall shrinkage in Cuba's purchasing power is demonstrated by the fall in imports from 8.1 billion pesos in 1989 to 2.3 billion pesos in 1992 and to around 2.0 billion pesos in 1993 and 1994. Since almost 90 per cent of total 1989 imports was made up of intermediate and capital goods,[30] machinery and raw materials rather than consumer goods inevitably bore the brunt of import cuts.

The speed and scale of the collapse in import capacity after 1990 made optimum resource allocation impossible. With hindsight, it is clear that imported resources were dispersed too widely in efforts to preserve too much and hence salvaged less than they might have done. In any event, while a healthy sugar industry remained vital to earn foreign exchange, its share of imported resources was quite insufficient to ensure its own reproduction. Cane farming had a low priority in the allocation of the

[29] AEC (1989), p. 24.

[30] *Ibid.*, p. 30.

limited imported resources assigned to agriculture as a whole. Its needs conflicted with those of a National Food Programme that sought greater food self-sufficiency but itself depended heavily on imported inputs.[31] The case for domestic food production in place of imports seemed compelling in the circumstances, all the more so as, compared with most food crops, sugar cane is robust and undemanding. Not surprisingly, the distribution of increasingly scarce imported fuel and fertilisers tended to be biased in favour of food crops. The same was true for labour.

Official accounts blame the fall in sugar production between 1990 and 1993 on shortages of fuel and lubricants, fertiliser and plant chemicals, and replacement machines and parts. Much is also made of adverse weather conditions – too much or too little rain. The dismissal in 1993 of the agriculture and sugar industry ministers implied inadequacies in crisis management, and references to 'unforeseen' difficulties suggested insufficient foresight.

Clearly, these factors are not all of equal weight, and an analysis must attempt to establish some order of importance. Owing to the dearth of official information, the following discussion rests primarily on data collected in fieldwork in 1994 and prior years.[32]

The empirical evidence strongly indicates that the principal causes of the sugar débâcle lay in the field rather than the factory. The most obvious problem was a drop in cane yields which in turn reduced productivity in harvesting, transport and processing, and eventually forced the adoption of practices that maintained output in the short run at the cost of longer-term losses.

Table 4 lists the cane yields in 1989/90–1992/3 of 12 cane farms in the provinces of Havana and Matanzas visited in April–May 1994. Seven of these were agricultural production cooperatives (CPAs), averaging some 950 hectares, while five were Basic Units of Cooperative Production (UBPCs) with an average size of 1,040 hectares. Both the older CPAs, originally organised among private farm operators, and the UBPCs are species of collective farms. The latter were formed from state canelands shortly before they were visited by this writer, and their figures refer to the time when the land was managed by the state.[33]

[31] See C. D. Deere, 'Socialism on One Island? Cuba's national Food Program and its Prospects for Self-Sufficiency', *Agriculture and Human Values* (Summer 1993).

[32] This fieldwork was carried out in areas first studied in 1988, selected at that time to illustrate developments in cane harvest mechanisation and the Agricultural Production Cooperatives (CPAs) formed from private sector cane farms. The areas were not typical of national cane agriculture, having above-average levels of mechanisation, irrigation and cane yields. In the event, these features made them more useful for an attempt, in 1994, to assess the effects of the post-1989 collapse of Cuba's international trade.

[33] The UBPCs 'Pedroso' and 'Socorro' emerged from the same block of state lands; hence the reported yields are identical.

Table 4. *Cane yields reported by selected cane farms, 1989/90–1992/3: metric tonnes per hectare (ha)*

	1989/90 tonnes/ ha	1990/1 tonnes/ ha	1991/2 tonnes/ ha	1992/3 tonnes/ ha	% Change 1989/90–1992/3
UBPC 'Fajardo', Habana	62	63	61	40	−35.5
CPA '17 de Mayo', Habana	86	90	79	54	−37.2
CPA 'Antonino Rojas', Habana	100	75	54	44	−56.0
CPA 'Revolución de Octubre', Matanzas	84	65	56	48	−42.9
CPA 'Manuel Ascunce', Matanzas	90	88	60	45	−50.0
CPA '17 de Mayo', Matanzas	99	96	69	59	−40.4
CPA 'Hermanos Almeida', Matanzas	89	87	75	39	−56.2
CPA 'Héroes de Moncada', Matanzas	82	67	64	40	−51.2
UBPCs 'Pedroso' and 'Socorro', Matanzas	64	62	59	53	−17.2
UBPC 'Arratia', Matanzas	—	79	64	51	—
UBPC 'Ciego', Matanzas	47	40	37	36	−23.4
Average	80	74	62	46	−42.5

—, not known.

Source: author's fieldwork, 1994.

All the farms visited show large falls in cane yields over the four harvests considered. In most cases the decline was greatest after 1990/1. Yields varied between farms by a factor of two at the outset, but the range narrowed as yields fell. In general, the farms with the highest initial yields had the largest relative declines. The average fall on the 11 farms over the four years was 42.5 per cent.[34]

The wide initial yield variations between farms are due to various factors, such as differences in soil quality. More intensive cultivation helps to explain why CPA yields were generally higher than those reported by the UBPCs for state farms. But whatever the reasons for the range of yields at the start of the period, the primary causes of their fall by its end are not in doubt. Shortages of fuel and fertilisers were decisive, and their adverse effects were compounded by the imposition of emergency harvesting practices which sought to maximise short-run output but exacerbated the deterioration of the plantations.

Data on fuel supplies for the sugar industry are not available. National

[34] C. D. Deere, M. Perez and E. Gonzales, 'The View from Below: Cuban Agriculture in the "Special Period in Peacetime",' *Journal of Peasant Studies*, vol. 21, no. 2 (1994), p. 216, publish cane yields of two sugar complexes (CAIs) in Havana province which show similar trends.

oil imports fell from 13.3 million tonnes (of which a part was re-exported) in 1989 to 8.6 million tonnes in 1991 and 6.1 million tonnes in 1992.[35] *A priori*, mechanised harvesting operations might have been expected to suffer most from fuel shortages but, while not immune, evidently enjoyed some priority. Instead, fuel restrictions bore most heavily on soil preparation, planting and cultivation. Neither state nor private cane growers were able to replant sufficiently. As a result, the proportion of higher-yielding plant cane and young ratoons declined and the average age of plantations rose. Lack of fuel also meant that growers had to cut back on cultivation and irrigation.[36]

However grave the fuel shortages, most farm managers questioned in 1994 attached even greater importance to the lack of fertilisers. National fertiliser imports reportedly fell from 1.3 million tonnes in 1989 to an estimated 300,000 tonnes in 1992.[37] At the end of 1993, it was said that chemical fertiliser applications to cane had declined from about 800,000 tonnes to just over 100,000 tonnes and fell yet further thereafter.[38] This was a return to the fertiliser usage of the mid-1950s. Filter mud and ash from the sugar factories, ash from cane trash burnt at cane cleaning centres, and compost – resorted to as alternatives – could not compensate for six- and sevenfold reductions in the application of import-based balanced (nitrogen, phosphorus, potassium) and nitrogenous concentrates. Over time, the lack of fertiliser impacted with increasing severity on the yields of plantations already suffering from the effects of fuel shortages. This was particularly noticeable where cane had been grown for many years and plant cane was sown not on fallow land but on fields just cleared of old ratoons. On the farms visited in 1988 and 1994, competition between different crops for the available arable land was generally keen and cultivation intensive. Their contribution to the rise in Cuba's cane production between the 1970s and 1980s resulted mostly from higher yields – chiefly reflecting greater use of fertilisers and irrigation – rather than an expansion of the area under cane. More intensive cultivation also explains why their average 1989/90 cane yield of 80 tonnes per hectare, shown in Table 4, was about a third higher than the national average. It was, of course, precisely the correlation between import-dependent intensive cultivation and high yields that made the latter so vulnerable to cuts in key imported inputs.

Official statements acknowledged the more obvious direct consequences of lower cane yields.[39] There was no comparable recognition of

[35] C. D. Deere, ' Cuba's national Food Program', p. 40.
[36] F. Castro, *Granma*, 21 Dec. 1993.
[37] F. Castro, *Granma*, 10 Oct. 1992.
[38] F. Castro, *Granma*, 28 Dec. 1993, and *Granma International*, 19 July 1995.
[39] See, for example, F. Castro and N. Torres, *Granma*, 28 Dec. 1993.

the additional negative impact of harvesting policies aimed at maximising short-term sugar production. These were decided not by production managers or even officials of the sugar ministry, but by senior policy makers preoccupied with the fate of the national economy. The progressive deterioration of Cuba's international trading position lent greater urgency than ever to sugar export receipts. At times, sugar sales were the only immediate means of getting money for vital imports, and sugar was sold while still in the field.

Maximising immediate export availabilities required harvesting all standing cane. This violated the normal practice of carrying over immature cane from one harvest to the beginning of the next. In the intervening months, such cane needs little attention and yields increase by about a third. In Cuba, roughly 15 per cent of the standing crop was usually held over. While harvesting cane normally held over increased immediate availabilities, lower field and factory yields meant higher unit production costs for the additional sugar. Moreover, this high-cost sugar was only obtained by sacrificing a larger tonnage, with a lower unit cost, in the next harvest.

Only extremely attractive prices would induce producers to ignore the drawbacks of cutting all available cane. This is what happened in the record harvest of 1952, though the hopes of a protracted price boom turned out to be misplaced. In post-revolutionary Cuba, harvesting immature cane to maximise short-term output was seen as a failing of the smallest and poorest growers in the private sector who, it was argued, could not afford to wait for the benefits of holding it over. From 1991, however, this same logic of poverty gripped economic planners at the highest levels of government.

All the farms visited in 1994 reported that cane initially designated to be held over had in fact been cut in either or both of the 1991/2 and 1992/3 harvests. Harvesting programmes in the state sector were altered by simple administrative fiat. The CPAs, for their part, responded to appeals to harvest extra cane as a patriotic duty, made more persuasive by premium prices to compensate for foregone future output and income.

Reports that all over Cuba 90 per cent or more of the total cane area had been harvested in 1991/2 shed light on one aspect of the course of Cuban sugar production after 1989/90 that had puzzled observers. At the end of 1993, President Castro discussed the difficulties experienced in the sugar sector in the preceding years.[40] From his description it appeared that the problems of the 1991/2 harvest had been almost as grave as those of the disastrous harvest of 1992/3. How, then, had Cuba still managed to produce 7 million tonnes of sugar in 1991/2 before collapsing to some 4

[40] *Granma*, 28 Dec. 1993.

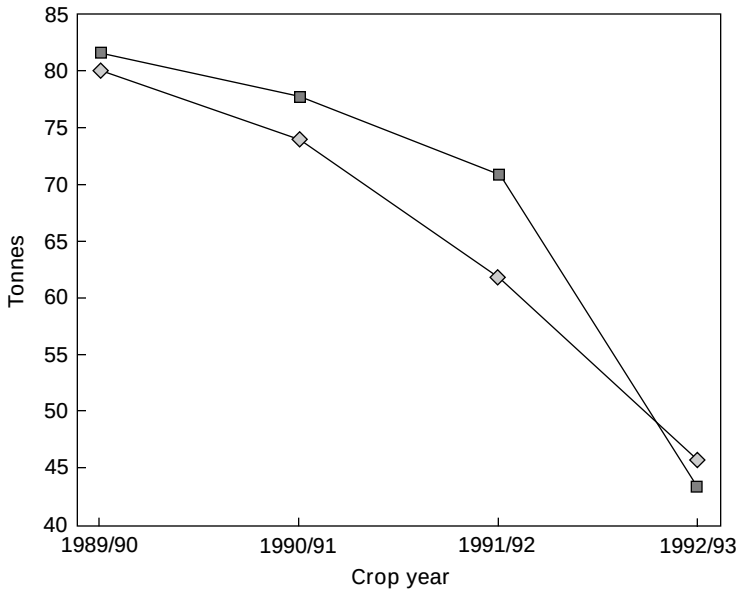

Fig. 1. *Sugar production/yields reported by selected cane fields.* ■, *Production, hundred thousand tonnes, raw value*; ◇, *cane yields, tonnes per hectare.*

Table 5. *National sugar production (thousand tonnes, raw values) and average cane yields (tonnes per hectare harvested) reported by selected cane farms: 1989/90–1992/3*

Crop year	Sugar production	Cane yields
1989/90	8,156	80
1990/91	7,779	74
1991/92	7,104	62
1992/93	4,365	46

Source: Sugar production from F. O. Licht, Cane Yields, Table 4.

million tonnes the following year? This became easier to understand if the 1991/2 harvest did in fact include most of the cane initially programmed to be held over to 1992/3, boosting the final outturn of the former and making the latter all the smaller.

Table 5 and Fig. 1 juxtapose the average cane yields of the farms visited in 1994 and national sugar production over the crop years 1989/90–1992/3. This shows that national sugar production held up better than yields from 1990/1 to 1991/2, but fell more steeply from 1991/2 to 1992/3. Caution is required when drawing lessons from a small sample of farms known to be in some respects unrepresentative. Even so, the data support the argument that the exigencies of Cuba's growing foreign

exchange crisis caused the adoption of harvesting practices that increased output in one year at the cost of greater production in the next. This may have alleviated some immediate import problems, but only by storing up trouble for the future.

Decisions to reap immature cane were matched by arbitrary extensions of harvest duration. Extending the harvest to make up for lost time and productivity could produce more sugar in the short run, as long as there was cane to grind. Again, however, immediate gain was bought at a high cost. Prolonging the harvest clashes with the rainy season – when field work is likely to be interrupted and there is less sugar in the cane – and shortens the growing period of the next crop. As noted earlier, the relatively high sugar-to-cane ratios of the 1950s were achieved in harvests rarely extending beyond the usually dry months of January to April, a practice abandoned after the Revolution.

The growing import crisis forced Cuba to sell much of the 1992/3 sugar crop before it was harvested. Official pre-harvest estimates reportedly pointed to a crop of about 6 million tonnes. This assumed normal conditions and was some 15 per cent down from 1991/2.[41] In the event, low yields, delayed factory starts, a disastrous storm and input shortages combined to slash daily throughput. Harvesting was extended to produce the sugar needed to meet contractual obligations. At the end of May and beginning of June, however, operations were brought to a disorderly halt by heavy rains, unusual only in their intensity. In addition to all other penalties, the prolonged harvest occupied resources that should have been deployed in cane planting and weeding. This was particularly damaging given the already palpable deterioration of many plantations.

These costly experiences, in no sense novel, seemed to be taken to heart in the planning of the 1993/4 harvest. Speaking to the National Assembly in December 1993, the new sugar minister Nelson Torres vowed: 'We repeat that one objective of this harvest is to finish early, fundamentally in April, and thus to dispose in time of the resources necessary for the tasks of cane sowing and weeding that reach their peaks precisely in May and June'.[42] When April 1994 actually arrived, however, prominence was given to a statement by Vice-President Carlos Lage, Cuba's chief economic spokesman, that if, as was vital, the year's sugar production plan was to be met, all provinces had to continue harvesting into May, and some into June.[43] In the event, heavy rains arrived before the end of May and stopped operations, as they had done the year before. There were reports of resumed harvesting as late as July, when sugar yields can hardly have been more than two-thirds of earlier levels.

[41] F. Castro, *Granma*, 28 Dec. 1993.
[42] *Ibid.*
[43] J. Varela Pérez, *Granma*, 16 April 1994.

Not to be overlooked, lastly, are the problems related to ageing machines and equipment in what was officially termed Cuba's 'Special Period'. From 1991, the supply of replacement units for the existing machine systems dried up. In 1991, the island's cane farms counted on 4,450 chopper harvesters, over 50,000 tractors, and more than 50,000 cane carts.[44] All but 94 of the harvesters were Cuban machines, built in a Cuban plant with an annual capacity of 600 units. Deprived of components previously imported from the Soviet Union, production came to a halt. Imports of the four main types of wheeled tractors, all Soviet models, also fell precipitously as did key replacement tyres and batteries. Lack of hard currency put suitable harvesters and tractors from capitalist suppliers out of reach. Renewal of the truck fleet was similarly constrained. Shortages of imported materials increasingly hampered Cuban factories making farm implements and parts. The outcome was a steady year-on-year increase in the average age of the national machine and equipment park. To stay in running order, that park now needed, but did not receive, a volume of parts and materials that not merely matched but exceeded imports prior to 1991.

With lack of replacements and mounting shortage of parts, breakdowns became more frequent and protracted. Extending operations into the rainy season increased the strain on old and poorly maintained equipment. Breakdown rates escalated, exacerbating the impact of falling cane yields on daily throughput and unit production costs. The long harvests, moreover, encroached on the time available for between-crop repairs and maintenance. This became critical as deliveries of inputs from ex-COMECON countries became more erratic. Summer fuel shortages compounded the problem, with power cuts shutting down workshops struggling to complete repairs against ever-tighter schedules. One of the many vicious circles bedevilling Cuba's 'Special Period' – a late end of one harvest leading to a late start of the next – was demonstrated in 1992/3 when almost two-thirds of the nation's sugar factories failed to start on time and hence contributed in large part to that harvest's disastrously late end.[45] In subsequent harvests, excess milling capacity created by low cane yields prompted the closure of a number of factories during the grinding season. This alleviated repair and maintenance difficulties, but required the diversion of cane to unfamiliar destinations with increased haulage distances, times and costs.[46]

[44] A.E.M.A. (1990), p. 156.
[45] Pollitt and Hagelberg, 'The Cuban Sugar Economy in the Cuban Era', p. 567.
[46] In Havana Province, for example, four of 16 factories remained closed during the 1993/4 harvest (*Granma*, 11 May 1994). A larger group of factories in Matanzas Province were shut down for the same harvest.

Reform

In 1993, the shortage of imported inputs and deterioration of existing equipment finally brought major reforms. In the most radical structural change in Cuban agriculture since the agrarian reform laws of 1959 and 1963, the large-scale farm enterprises hitherto owned and operated by the state began to be dismantled. Different arrangements would, it was hoped, achieve more efficient use of available resources, foster labour-intensive practices and import substitution, and, where possible, increase labour productivity by better work organisation and incentives.

Up to 1993, non-cane state agriculture was organised in large state farms (*Granjas del Pueblo*) controlled by the ministry of agriculture. Cane-growing state farms, on the other hand, were from the early 1980s onwards integrated into mill-plantation complexes (*Complejos Agro-Industriales*, or CAIs) administered by the sugar ministry. By 1992, state farms and cane lands in CAIs together comprised over 75 per cent of arable Cuban farmland. From 1993, the management of both cane and non-cane state agricultural operations was progressively devolved to smaller, more autonomous enterprises called Basic Units of Cooperative Production (*Unidades Básicas de Producción Cooperativa*, or UBPCs). These are part worker cooperatives, part collective farms, composed mostly of former state farm or CAI employees working for wages and distributed profits on lands leased in perpetuity from the state. By the beginning of the 1993/4 sugar harvest, some 90 per cent of CAI-administered cane lands and a somewhat smaller percentage of state farm land had been transformed into UBPCs. In size, management structure and organisation these were largely modelled on the Agricultural Production Cooperatives (*Cooperativas de Producción Agropecuaria*, or CPAs) that had been fostered among private farms since 1977.

CPAs and UBPCs

The CPAs had come about for reasons familiar to historians of socialist agriculture. By pooling their holdings in larger enterprises, it was argued, individual farmers achieved economies of scale through more rational, specialised use of land and labour, combined with modern methods of production. Socially, concentration of dispersed peasant households simplified the provision of electricity, sanitation and better housing, schools and medical care. In the early years, the typical CPA was quite small, averaging 206 hectares and 29 members in 1980. By 1985, mergers and the creation of new CPAs had increased the average area to 732 hectares and the membership to 51, the growth being more marked in cane CPAs than others. Cane CPAs now averaged 953 hectares and 73

members, exceeding non-cane cooperatives by 50 per cent in area and 79 per cent in membership. Large cane CPAs allowed the physical relocation and expansion of plantations which, together with exchanges of land between CPAs and the state, facilitated harvest mechanisation. By 1989/90, some 63 per cent of CPA canes were cut by machine, against 26 per cent of private, non-CPA canes, and CPAs owned 560 chopper harvesters together with all ancillary equipment.[47]

Growth in area, membership and level of mechanisation entailed changes in the management of CPAs. Initially, they were generally presided over by older farmers, well-versed in traditional methods and prominent in their local peasant associations. Together with their fellows (with whom they commonly had kinship ties), they farmed small groups of holdings employing familiar techniques. But with expanding size and membership and more mechanisation, the CPAs became less 'peasant-like'. The transition often generated administrative crises ending in the replacement of founding CPA presidents by younger members. Recruits from the state sector strengthened many expanding CPAs, providing skills in book-keeping and the handling of larger stocks of machinery and equipment. The transformation process was given further, albeit unintended, impetus by the retirement of older CPA members who took advantage of newly available pension rights in 1983. The exodus of older peasants checked and then reversed the rising trend in average CPA membership numbers, stimulated off-farm recruitment of new CPA members, and speeded the adoption of labour-saving methods.[48]

As a result, most CPAs came to the post-1989 import crisis not as simple peasant collectives employing predominantly traditional farming methods on lands now held in common. Rather they were quite large agricultural enterprises, using machines, fertiliser, herbicides, and other imports on a scale approaching state farms and CAI lands. But average CPA performance in terms of yields and unit costs was clearly better and, however much changed, CPAs still combined new and traditional cultivation practices, notably in producing food crops for on-farm consumption. Here, they commonly used oxen to plough and cultivate, and the roots of CPAs in peasant farming were clear. Compared with their larger counterparts in the state sector, CPAs in general got more work out of their labour and machines, and their equipment lasted longer. To Cuba's political leaders, faced with the need to promote less import-intensive farming methods, their example was compelling.

While the UBPCs reduced the size of farms in Cuba, the new units still

[47] Pollitt and Hagelberg, 'The Cuban Sugar Economy in the Cuban Era', pp. 555–7.

[48] See C. Deere, N. Pérez and E. Gonzales, 'the View from Below: Cuban Agriculture in the "Special Period in Peacetime"', *Journal of Peasant Studies*, vol. 21, no. 2 (1995).

averaged 1,000 hectares or more and these made up about 42 per cent of the national arable area at the end of 1994. The CPAs, averaging about 650 hectares, then occupied a further 10 per cent. Privately-owned small farms, averaging about 12 hectares, occupied no more than 15 per cent.[49] The creation of UBPCs neither ended large-scale nor strengthened small-scale farming. What it did do was reverse the historic tendency of the post-revolutionary Cuban state to assume direct administrative control over an ever greater share of the nation's agricultural resources and to manage them in ever larger enterprises. This was most obvious in the sugar industry where centralised state controls reached a peak with the integration of agricultural and industrial operations in CAIs after 1980.

With the growth of cane harvest mechanisation in the second half of the 1970s had come the idea that fast expansion and efficient management of the new production systems required the integration of field and factory in a single enterprise. Such integration would secure the compliance of growers' practices with processers' needs.[50] In fact, the basic issues of field–factory relations behind this thinking were not new. On the contrary, they echoed famous debates around the Cuban sugar industry in the 1920s and 1930s and it is instructive to compare the creation of UBPCs in the 1990s with the organisational response of the Cuban sugar economy to the Great Depression of the 1930s.

The UBPCs in historical perspective

The phenomenal expansion of the Cuban sugar industry in the first quarter of this century left two systems of cane and sugar production in place. Typical of the first were the huge miller–planter complexes established on the eastern plains of Camaguey and Oriente with massive infusions of US capital. The other consisted of older, smaller Cuban-owned factories in central and western Cuba which drew their cane supply mainly from numerous independent growers cultivating their own or rented land. Neither system existed in pure form: Cubans participated significantly in the first, and both included large growers employing many

[49] For the 1994 shares of arable land held by different categories of cooperative and private farms, see *Granma International* (*G.I.*), 17 January 1996. Not considered here are small plots, privately owned or leased from the state. These were significant in number in the 1960s, may have declined somewhat thereafter, but grew vigorously in the 1990s with official encouragement to relieve the scarcities. While important in number and in subsistence food production, their share of national farm land was tiny. B. H. Pollitt, 'Agrarian Reform and the "Agricultural Proletariat" in Cuba, 1958–66: Some Notes', Occasional Paper No. 27, University of Glasgow (1979); B. Pollitt, 'Agrarian Reform and the "Agricultural Proletariat" in Cuba, 1958–66: Further Notes and Some Second Thoughts', Occasional Paper No. 30, University of Glasgow (1980).

[50] A. del Monte, 'La integración agroindustrial azucarera, *ATAC*, no. 2 (Mar–April 1980), pp. 12–26.

workers. Even so, as the so-called crisis of overproduction of the later 1920s melted into the 1930s Depression, nationalist rhetoric highlighted the differences between a 'foreign' and a 'Cuban' sugar economy. The small and medium-sized *colonos* supplying most of the cane in the latter were extolled as a kind of sturdy yeomanry, to be cherished as the backbone of social stability in rural Cuba.[51]

As stagnation turned into collapse, Cuban sugar interests and nationalists in general feared that 'their' sugar economy would be overwhelmed and that only the 'alien' miller–planter complexes would survive the crisis. They marshalled a battery of political, social, economic and technical arguments in favour of the *colono* system and against 'administration cane' owned and managed by the mill. In key respects, their arguments are still fresh. First, in answer to the claim that the mills had to own and manage plantations in order to guarantee the cane supply, nationalist spokesmen said that contracts specifying quantities and times of delivery would achieve the same end, with simple controls ensuring that the cane was clean and fresh. If, as was often the case, *colonos* leased land from the sugar companies, their tenure could, moreover, be tied to their supply performance. Secondly, *colonos* did not grow only cane. They also grew, or could grow, food for on-farm consumption, barter or sale, benefiting themselves and the nation. Hence, their real income did not depend entirely on cash cane receipts, but was always augmented by their own food supply. *Colonos* could thus survive periods of depression that would bankrupt enterprises whose viability depended wholly on their cash flow.[52] In fact, the *colono* system, seemingly doomed in the early 1930s, not only survived the Great Depression, but emerged protected and strengthened. In the 1950s, at least 85 per cent of Cuba's cane was grown by *colonos*.[53]

[51] For detailed discussion of the nature and conflicts of the national and 'foreign' sugar economy in Cuba from the 1920s, see e.g. R. Guerra y Sánchez, *La Industria Azucarera de Cuba* (Havana, 1941); J. Martínez Alier, *Cuba: Economía y Sociedad* (Paris, 1972); R. Guerra y Sánchez, *Sugar and Society in the Caribbean* (New Haven, 1964); B. H. Pollitt, 'The Cuban Sugar Economy and the Great Depression'.

[52] Guerra y Sánchez (cited in fn. 51), and *Historia de la Nación Cubana*, vol. IX, ch. III and VII, Havana 1952. The Sugar Coordination Law of 1937 regulated the rights and obligations of *colonos* in great detail. *Colonos* who failed to produce staple foodstuffs could be prosecuted and fined. It is doubtful whether this provision was enforced to any extent, but its enactment reflects the economic rationale that underpinned the *colono* system.

[53] *Colonos* were classified as large, medium and small, according to the cane quotas assigned them by the sugar factories. Data as to their relative numbers and shares of the crop in the 1950s are not precise. In the peak harvest of 1952, their total number reportedly exceeded 60,000. Cane production was heavily concentrated in the hands of the larger growers: small *colonos* made up almost two-thirds of the total number of growers in the mid 1950s, but apparently produced less than 10 per cent of the total cane ground (see Pollitt, 'The Cuban Sugar Economy and the Great Depression', p. 28).

The decision in 1993 to dissolve the CAIs and form UBPCs therefore was no leap in the dark towards an untried system of cane supply. Basically, it was a return to the way in which the cane supply was organised before the Revolution. With the creation of UBPCs, 'administration cane' reverted to the minor role it had played in the 1950s, and the UBPCs and CPAs dominated cane production much as the large *colonos* had done in pre-revolutionary days. The number and role of medium and small *colonos* did not greatly change after 1959: they lived on in the private sector either in Credit and Service Cooperatives (CCSs) or as individual members of the National Association of Small Farmers (ANAP).

The UBPCs and agricultural labour requirements

The UBPCs were also a response by the state to the acute crisis in the structure of the workforce provoked by the collapse of Cuba's post-revolutionary development strategy which had sought to expand industry, construction and services with capital generated primarily by increased agricultural exports, principally sugar. These exports were secured not by employing more farm labour, but by mechanisation and greater use of material inputs. In fact, employment in agriculture fell, in contrast to a substantial growth in non-farm, primarily urban, employment. Although crude, the official employment statistics before and after the Revolution serve to illustrate the trend. Out of an economically active population of about 1.8 million in the early 1950s, more than 800,000 or over 40 per cent, were reportedly engaged in agriculture, livestock, forestry and fishing.[54] In the 1960s, the labour force in agriculture declined significantly, whereas the total economically active population increased.[55] Over the following two decades, the farm workforce fluctuated between 600,000 and 700,000 in a total economically active population that reportedly rose from just over 2 million in 1970 to about 3.4 million in 1988 (A.E.C. various years). By 1970, then, agriculture apparently generated less than 30 per cent of total employment and by 1989 only about 20 per cent. In absolute numbers, there were fewer workers in agriculture in 1989 than in 1959, and agriculture's share in total employment seems to have halved. The absolute numbers and relative shares of the population reported to reside in urban and rural areas in the respective years show a similar trend.

For present purposes, little is gained by analysing these figures in greater detail. Neither pre- nor post-revolutionary national statistics

[54] *Censos de Población, Vivienda y Electoral* (Havana, 1953).

[55] B. H. Pollitt, 'Employment Plans, Performance and Future Prospects in Cuba', in R. Jolly et al (eds.), *Third World Employment* (London, 1973).

reflect the greater seasonal fluctuations in agricultural employment or the large numbers of non-agricultural workers annually mobilised after the Revolution for harvesting and other tasks. The peak size of the agricultural labour force in both periods is significantly understated, and the data as presented obscure rather than illuminate the ways in which farm labour requirements were actually met.[56]

The collapse of the capacity to import the materials that underpinned production in previous decades radically altered farm labour requirements. Agriculture now needed additional labour and animal power to compensate for the shrinkage of its machine park (aggravated by the fuel and other shortages that impeded most effective use of the equipment still serviceable) and the lack of herbicides. Cutbacks in fertiliser and irrigation could be partly – but only partly – offset by more careful manual planting and weeding.

The same difficulties that crippled the sugar industry also disrupted an ambitious programme to increase national food production launched some years before the end of COMECON. Moreover, the drastic decline in imports of processed foods and animal feedstuffs exacerbated food shortages, particularly in urban areas, leading to a marked fall in popular nutrition levels. Improvement of the food supply became politically as well as socially imperative. Two well-publicised measures were the encouragement of individual, small-scale cultivation of idle land in urban and rural areas, and the reopening of urban markets that now sold produce from state as well as private farms. There were also increased mobilisations of urban labour to meet peak needs in various agricultural operations, and efforts were made to recruit workers from the growing number of urban unemployed for resettlement in rural communities. At the same time, hitherto specialised, large-scale agricultural enterprises – among which sugar cane producers were by far the most important – were urged to grow more food crops and fodder with a view to becoming self-sufficient and selling surpluses on local markets. This was to improve the food supply in rural areas and relieve the pressure on an increasingly strained national freight system. Crucially, the programme was also intended to halt and reverse the fall in farm workers' real wages caused by

[56] See B. H. Pollitt, 'Employment Plans'; B. H. Pollitt, 'Some Problems in Enumerating the "Peasantry" in pre-Revolutionary Cuba', *Journal of Peasant Studies*, vol. 4, no. 2 (1977), pp. 162–80. In addition, organisational changes produced arbitrary redefinitions of agricultural and non-agricultural employment. For example, according to the statistical yearbooks, the number of agricultural workers declined markedly between 1981 and 1984 while the number of industrial workers rose correspondingly (see, e.g. A.E.C. (1988), p. 192). The main reason, however, was not an exodus of workers out of agriculture and into industry but the incorporation of state cane farms into CAIs which classified all their workers as 'industrial'.

the national economic crisis. This was essential both for the recruitment of new agricultural workers and to raise the productivity of the existing labour force. Achievement of these objectives hinged on the CPAs and, in greater part, on the new UBPCs, especially in the cane sector.

Cane UBPCs were meant to increase food production by expanding the total area cultivated and not at the expense of the area under cane. Since most food crops require more labour per hectare than cane, this increased labour needs more than proportionately. Such incongruences were heightened by the mounting problems of attending to the existing cane.[57]

Normally, modern cane farming offers fewer possibilities of substituting labour and animal power for machines than most food crops. The highly promoted programme to use draught animals – mainly oxen – in place of tractors had little relevance to the task of preparing heavy clay soils for cane planting. Ox-drawn carts cannot keep pace with chopper harvesters, and their wider deployment to haul hand-cut cane would entail building thousands of low-capacity carts, smaller than those currently used. Of course, with appropriate vehicles or implements, animals could be employed in haulage and various cultivation jobs. But the fact remained that substituting animal power for trucks and tractors generally entailed a large loss in labour productivity.

On-farm investigation in 1994 indicated that, depending on the job and surrounding conditions, 8–12 pairs of oxen were required to replace one tractor, and therefore the same number of men to replace one tractor driver. If the 20 or so tractors typical for most CPAs and UBPCs were all to be replaced by oxen, the entire workforce would be employed in handling them. And while it was true that tractors needed fuel, lubricants and parts, it was also true (though less openly recognised) that oxen had to be fed, watered and harnessed, consuming resources that could be devoted to raising livestock to provide meat and milk. Pro-ox propagandists argued that in Mexico – a large oil producer – more than 60 per cent of agriculture used animal power.[58] What they overlooked was that large-scale use of draught animals was generally associated with very low labour productivity and widespread rural poverty.[59] In order to get

[57] An extreme case is the CPA 'Antonino Rojas' located in Havana province where the need to improve food supplies to the capital caused significant diversions of land from cane to food production. In this CPA, one third of a total cane area of some 400 hectares was diverted to food crops between 1991 and 1994. To obtain the additional labour required by the change in land use as well as more labour-intensive cultivation of the reduced cane area, the cooperative had to increase its membership from 70 to 120.

[58] R. Pages, *Granma*, 17 Nov. 1993.

[59] Ecological enthusiasts may be tempted to make a virtue out of necessity when commenting on the enforced 'greening' of Cuban agriculture, arguing that it 'might be the best model to follow for worldwide agricultural sustainability' (see 'Global Exchange' publications distributed from the College of Natural Resources, University

people to work with oxen in Cuba, there could be no significant reduction in the wages of more highly paid workers diverted from other activities. Accordingly, ox drivers and tractor operators were paid at similar daily rates in 1994, despite the large difference in productivity. As a result, the growing use of animal traction in CPAs and UBPCs meant bigger wage bills and higher costs of production.

Though cane typically requires less labour per hectare than food crops, with limited opportunities for using animals in place of machines, the recovery of sugar production projected from 1993 onwards implied much greater expenditures of labour to renovate exhausted plantations. In December 1993, a huge replanting plan was announced, totalling 60,000 *caballerías* (805,000 hectares), divided equally between 1994 and 1995. Planting on this scale had not been seen since 1980–1 when Cuba's most popular cane variety, affected by rust disease, had to be demolished. The 1994–5 programme obviously entailed a much higher labour input, particularly for manual weeding which was scheduled to increase by over 40 per cent in 1994. The number of ox teams was to rise from 24,500 to 45,000 within a year.[60] Other schemes sought to offset reductions in fertiliser and irrigation water application by greater plant densities, reverting to the narrower between-row spacings in vogue before mechanised harvesting. A number of chopper harvesters were taken out of service for necessary adaptations.

Unrealistic planting targets were accompanied by ephemeral *ex cathedra* projections on the ultimate goal of the recovery.[61] And it was beyond doubt that the required expenditure of resources was incompatible with the reductions in production costs and state subsidies simultaneously advanced as policy objectives.[62]

At first sight, large-scale recruitment of new members for cane cooperatives looked difficult. From the 1960s, rural youth were provided with universal education and growing urban employment opportunities. This had encouraged a migration from agriculture, most marked in isolated regions and for crops with low rates of technical innovation and

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of California, Berkeley). Not discussed are the accompanying reductions in output and labour productivity.

[60] N. Torres, *Granma*, 28 Dec. 1993.

[61] Sowings lagged behind plans as early as October 1993 (J. Varela Pérez, *Granma*, 20 October 1993). Shortly after, President Castro defined production targets as 'between 7 and 8 million tonnes' of sugar at a near, but unspecified, date (F. Castro, *Granma*, 28 December 1993), i.e. a return to 1980s production levels.

[62] 'Elimination' of the massive state subsidy to the sugar industry was part of the recovery programme announced by Torres (*Granma*, 28 December 1993). This was immediately qualified by Castro who stressed that the programme's prime objective was not to eliminate the subsidies, but to produce more sugar to meet Cuba's basic international financial needs (F. Castro, *ibid*).

mechanisation. Coffee and tobacco were typical, and the stagnant or falling output of these in the 1970s and 1980s was linked to the ageing of a peasantry unable to replenish itself with its own children. By contrast, in areas and types of production where cultivation practices had been transformed, the associated growth of new, skilled, more productive and better-paid agricultural jobs could retain or attract young workers with good general and technical education. Cane production was a case in point. Throughout the 1970s and 1980s, cane-harvest mechanisation had been a conspicuous example of 'labour-saving technical progress' permitting large increases in output and labour-productivity. But it had also been 'labour saving' in the quite different sense of checking a fall in the cane-farm work force by expanding an elite of high-paid machine operatives.[63] In the 1990s, however, a counter-revolution in agricultural technique was the order of the day. A process of what could be termed 'technical regression' sought to re-establish a variety of practices widespread in Cuban farming prior to the so-called 'industrialisation of agriculture' of the 1970s and 1980s. Since it depressed the productivity of labour so sharply, it was easy to view the process as a simple shift from 'modern' to 'traditional' (or 'advanced' to 'backward') agriculture, but this concealed the complexity of its impact on labour requirements. On the one hand, technical regression most obviously required many more workers for laborious, low-productivity tasks using implements no more sophisticated than the mattock, hoe or machete. Such jobs did not *per se* attract workers with high skill levels. Against this, however, greater skill, ingenuity and manpower was necessary to maintain and operate an ageing machine park short on parts, lubricants and other essentials. Last but by no means least, 'traditional' methods of raising livestock and producing diverse food and other crops required experience and aptitudes lacked by many workers locked into the more advanced divisions of labour of large-scale 'modern' agriculture. Technical regression in Cuba in the 1990s did not thus involve a simple, generalised de-skilling of agricultural work but was a process in which the acquisition of many old skills perforce accompanied the shedding of some new ones. Viewed as a whole, the transformation in the labour process associated with technical regression looked unfavourable for the mass recruitment of new farm workers, but this could be offset by the lure of agricultural work as a means to guarantee basic household food security. For many rural and urban households, the deterioration in the volume, quality and reliability of food supplies from 1991 was the most acutely felt dimension of falling national living standards. In such a context, the success or failure of ambitious recruitment programmes for UBPCs and

[63] Pollitt and Hagelberg, 'The Cuban Sugar Economy in the Soviet Era'.

CPAs could thus be the outcome of a tussle between forms of technical regression that could repel recruits to farm work, and enhanced prospects for food security that could attract them.

This conflict did not work itself out in the same way in CPAs as in UBPCs, nor did it express itself with the same force in different urban and rural settings. To want work on CPAs, for example, was not enough to secure it on the terms generally preferred. For years prior to the 1990s crisis, CPAs had little difficulty in securing new members when needed. Many undertook recruiting drives after 1983 when the introduction of pension rights prompted an exodus of older members. The ease with which they refilled their ranks reflected the relatively high living standards enjoyed by CPA members, compared with state farm and CAI workers. Fieldwork in 1988 found that CPA management could be highly selective in conferring membership, commonly restricting entry to relatives of existing members and often insisting on probationary periods before full rights (particularly to distributed profits) were granted. New members thus tended to be of proven aptitude, industriousness and social acceptability and maintained or increased average income levels within the CPA. Moreover, since new recruits were commonly assigned the most physically taxing work, older members could be released for less arduous tasks.

The caution of CPAs about recruiting large numbers of new full-time members was easily understood, but it could jibe with the more ambitious aims of government. For the latter, a rapid expansion of full-time agricultural employment was essential both to restore agricultural production and to alleviate pressing social problems associated with the growth of a mass of under- and unemployed urban labour. Hence it might be reckoned 'from above' that CPAs needed, say, an additional ten thousand members.[64] 'From below', however, a different calculus could yield a quite different sum. Indeed, CPAs were often reluctant to take on additional workers.

While CPA caution about confirming exact, ambitious recruitment programmes might reflect desires to protect the interests of existing members, it was also clearly rooted in practical concerns about real conditions of production. And it was precisely this grass-roots perception of real productive conditions that tended to be obscured in the data offered at higher levels and purporting to be actual CPA recruitment programmes.[65]

[64] See, e.g. G. Carriazo 'Cambios estructurales en la agricultura cubana: la cooperativización', *Economía Cubana: Boletín Informativo,* no. 18 (Nov. 1994), p. 19.

[65] This warping of the magnitude and precision of statistics in their transmission from one level of authority to another was not an isolated phenomenon, but a microcosm of a

UBPCs in cane farming were established *en masse* only in the final months of 1993. The 1994 fieldwork could not thus illuminate recruitment policies or experiences as solid as those observed for well-established CPAs and their treatment must hence be more limited and diffident. Moreover, in the months following their formation the scope of work in many UBPCs was exceptional. As subdivisions of the larger state cane enterprises (*granjas*) antedating them, many UBPCs initially lacked canteens, offices and workshops. The harvesting of their first cane-crop (1993–4) was thus commonly accompanied by intense activity in building and construction. At the same time, urgent attention was given to preparing and planting the area that would provide UBPC canteens and households with the bulk of their staple foods. A beginning was made also on livestock-rearing projects for the eventual on-farm provision of meat, milk and eggs. In this formative period, exchanges and loans of food, equipment and services between UBPCs, and between UBPCs and CPAs, commonly eased transitional shortages. The initial size and structure of the UBPC labour force tended to be fluid, reflecting in part the exceptional labour-needs of these early months. By May 1994, however, the four UBPCs studied in Matanzas province reported a total of 346 members – an average of 87 per enterprise – and 60 contract workers. Of the latter, an unspecified number would become full members after a probationary period (usually of three months) had been served. In their area, number of members and general organisational principles the UBPCs were similar to their local CPAs, from which they also commonly solicited counsel. Their founding memberships comprised most of the previous workforce of the state *granja* and all drew upon a pool of would-be members, some of whom offered (in a situation reminiscent of the Great Depression) to work for food alone.

The labour recruitment problem in all UBPCs was not one of simple numbers, but of enlisting workers able to perform the full range of tasks associated with changing types and techniques of production. One challenge lay in the maintenance of the inventories of machinery and equipment with which the UBPCs were initially endowed. The UBPCs studied in 1994 in Matanzas province were at first sight better placed than local CPAs as regards the modernity of their stocks of cane-harvesters and tractors. Harvest mechanisation in the five CPAs studied had been swift and comprehensive, all their cane being cut by nine chopper-harvesters averaging over 11 years of age. These were first-generation KTP-1

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wider reality in which primary data could be moulded to match more ambitious, higher-level statistical expectations. The inevitable outcome of the process was the erosion of the realism of national plans.

models, later upgraded with KTP-2 engines and other parts. By comparison, the eight UBPC harvesters averaged just over seven years of age, six being second-generation KTP-2s and two Australian Toft-6000s. However, machine upkeep was generally reckoned to be better on CPAs than in state-run agriculture. This was partly – and paradoxically – because their mechanisation programmes had been assisted by the recruitment of mechanics and machine operatives from state enterprises. High levels of mechanisation in CPAs had thus been accompanied by a parallel development of good, attentively supervised, maintenance and operative skills to which was added the exercise of considerable improvisational capabilities. As a result, the average age of harvesters or of other farm machinery was no reliable guide to their comparative condition or potential performance in CPAs and UBPCs, respectively. This was exemplified by repeated engine seizures that put two KTP-2s out of action for most of the 1993–4 harvest on the UBPC 'Arratia' while no comparable failures were reported by the CPAs. A clear priority for all newly-formed UBPCs was the establishment of autonomous, reasonably equipped and competently manned repair and maintenance facilities and the recuitment of growing numbers of workers with the appropriate skills.

At the other end of the technical spectrum was the challenge posed by increasing the use of animal traction in the cultivation of cane and in the production of an expanding range of food crops. As a rule, UBPCs were less well-placed than CPAs to increase their use of oxen for ploughing and cultivation. The workforce of the one-time state farms, from which UBPCs drew the bulk of their members, generally lacked familiarity with the rearing, domestication and management of ox-teams. CPA members and recruits, by contrast, usually came from peasant households and CPAs could tap both old and young members for experience or vocation in handling oxen, mules or horses. Moreover, while not necessarily representative of the general situation, the average proportion of the total area under cane was substantially higher in the UBPCs studied in 1994 than in the CPAs. The five UBPCs listed in Table 4 reported an average 86.9 per cent of their total area to be planted to cane. This compared with 64.6 per cent reported by the seven CPAs. If the availability of pasture was reported to limit the use of oxen in at least two CPAs, this constraint seemed yet more powerful in the UBPCs. Such factors suggested, firstly, that UBPCs would depend far more than CPAs on state provision of trained ox-teams and, secondly, that any very ambitious expansion of their use would entail yet sharper conflicts in UBPCs than in CPAs in the employment of land as well as labour.

The expansion of food production and livestock rearing in cane UBPCs

was intended firstly to secure self-sufficiency in the provision of most food staples and then to provide surpluses for consumption in local towns and villages. Such programmes involved an expanded use of animal traction and more labour-intensive techniques of cultivation in general. The latter did not usually require skilled labour, but new food production programmes as a whole required local expertise for appropriate field- and crop-selection and for the design of work timetables compatible with the primary requirements of the cane crop. Such expertise did not emerge automatically from managers and workers previously devoted to more specialised, mechanised cane-farming. As a rule it was secured partly by selective recruitment, partly by consultation with local CPAs or peasant households and, in the worst of cases, by trial and error.

Whether for CPAs or UBPCs, the primary source of new recruits or contract labour was not the unemployed workforce of the largest urban centres. It tended, rather, to be workers who had left agriculture in previous years for other jobs in local towns or villages. While their return to agriculture was motivated primarily by the prospect this offered of guaranteed food security, their previous experience of agricultural work and a rural milieu also minimised the breach in work and social life that such a move entailed. In any event, by comparison with Havana and some of the provincial capitals, the gulf between the social life of smaller provincial towns and villages and the rural communities of CPAs and UBPCs was not that great. Moreover, infrastructural failures such as cuts in power, water and transport reduced yet further the perceived advantages of urban *vis-à-vis* rural life.

Whatever their origin and whatever the tasks in which they were engaged, there was a consensus that, compared with state farm workers, UBPC members worked more intensively and for a greater number of hours per day. The administrations of both UBPCs and interested local CPAs noted this to be expressed principally by higher attendance at afternoon fieldwork where absenteeism had been chronic on state farms. Several factors were adduced to explain the difference. A smaller-scale enterprise permitted work to be more closely supervised and disciplinary sanctions that included suspension or expulsion from membership for offences such as unjustified absenteeism were reckoned to be effective. Input shortages made it imperative to improve labour-productivity by paying greater attention to the needs of the work-force. The latter included basics such as adequate work clothes and footwear that the UBPCs could not themselves supply but they could also take the form of organising work programmes so that heavy labours (e.g. in the cane) were undertaken in the cooler mornings and lighter tasks (such as cultivating food crops) in the afternoons. Stress was placed on the incentive effects of

more direct links between individual and group productivity and real levels of consumption, particularly in the form of canteen meals and household food supplies. Finally, it was emphasised that members had a vested interest in enterprise efficiency since this would be reflected in the level of distributed dividends.

In fact, the incentive efficacy of annually distributed money dividends within UBPCs was unclear. In the first place, the dividends distributed in even the most efficient CPAs had been cut by the low cane-yields that depressed production and increased costs between 1989 and 1993. For example, in the five CPAs studied in Matanzas province in 1994, for the two years 1988–9 and 1989–90, annually distributed dividends had averaged 175,400 pesos and formed a substantial part of members' household money-income. By 1992–3, however, the average dividend was reported to have fallen by almost one-half, to 93,400 pesos, and at national level growing numbers of cane CPAs were reporting losses. In such circumstances, it was doubtful whether many UBPCs would be able to produce significant, sustained distributable profits. Secondly, with the post-1990 national economic crisis, the real purchasing power of money was drastically eroded by mounting shortages of basic consumer goods. This depressed the incentive value of money dividends. Moreover, since the size of enterprise revenues was not matched by power to acquire needed farm-inputs, managerial incentives to maximise enterprise efficiency and earnings were weakened.

Incentive problems of this kind were likely to be of greater importance for cane farms, however organised, than for the generality of agricultural enterprises. This was because their primary activity was necessarily production for sale, not consumption, with the state-owned sugar factory being their sole market. Most appraisals of the nature and problems of UBPCs, however, focused on their development in the non-cane sector.[66] Given a national shift from centralised to decentralised economic management and from larger-to smaller-scale enterprises, the organisation of these UBPCs was criticised for lack of autonomy, with tight controls continuing to be exercised by supply and purchase agencies. There was argued to be a lack of managerial experience, compounded by their members' weak 'ownership mentality', and the enterprises were generally deemed to have too scant a participation in free markets for agricultural products.

Whether or not such observations were pertinent for non-cane UBPCs, they did not accommodate important pecularities of cane production. In

[66] Carriazo, 'Cambios estructurales', and G. Carriazo, 'El proceso de transformación económica en Cuba y las pequeñas y medianas empresas. El ejemplo de las UBPC', *Economía Cubana: Boletín Informativo*, no. 23 (Sept.-Oct. 1995), pp. 17–19.

the first place, the necessarily intimate relationship between cane growing and processing meant that the autonomy of cane-farm management would inevitably be restricted by the economic and technical needs of the sugar factory. Secondly, most cane UBPC administrators were initially nominated by the state-run sugar factories who had previously employed them in the management of field-operations. Some might be, and were, criticised from both above and below for an authoritarian managerial style considered out of place in UBPCs but their inexperience was not in the management of cane production *per se*. It was, rather, in managing a transition that added food-crops to the established cane area and adopted more traditional techniques of cultivation within a novel organisational setting. The issue of 'free markets', of course, was substantially irrelevant for cane production though not for such harvested food-crops as were surplus to on-farm consumption. Finally, farm input shortages were largely explained by an acute crisis in national import capabilities and, if the allocation of scarce supplies was in any way to reflect nationally ranked priorities in production, their distribution would necessarily be subject to tight controls.

Given all this, the key problem of cane UBPCs was best posed in rather different terms. In essence, the cutting edge of their members' work motivation was not the money wages and dividends they earned from their work in the cane-fields. It was, instead, the entitlement conferred by their membership to the output of essentially peripheral activities in rearing livestock and cultivating food-crops. Generous canteen meals were cheap and, while foodstuffs delivered to members' households were not priced uniformly, they were often below the subsidised prices for rationed foodstuffs sold through the state retail distribution system and were far lower than prices on alternative markets. The outcome was that the food consumption of UBPC members – the most important component of their real income – did not reflect enterprise performance in growing cane for the local sugar factory but what in terms of the allocation of labour, land and other resources were the marginal activities of subsistence farming. Clearly other components of real income were also important to actual or potential UBPC members. These could include access to building materials to improve housing, pharmaceutical products, boots and other appropriate work-clothing, and sundry other items of consumption. But, with the obvious exception of medicines, particularly for children, these needs tended to be secondary and, as with food supplies, their availability was not self-evidently linked to enterprise performance in cane production. Given all this, there was no obvious, self-regulating long-run mechanism to stimulate either workers to maximise their efforts in the cane-fields or UBPC managements to

implement ambitious cane recovery programmes. The latter consisted mainly of expanding the area under new cane and this required substantially increased outlays of labour and other resources that could conflict with preferred activities in livestock-rearing and food production. In the fieldwork carried out in 1994, incentive problems such as these seemed likely to be important but, with no likelihood of substantial short-term amelioration in scarcities of key consumer goods or farm inputs, they could be tackled only by *ad hoc* measures which modified relative peso prices for output while giving some limited privileged access to consumer goods available only for convertible currency.

Prospects for recovery

Discussion of possible recovery of the sugar economy is inevitably speculative. The first question arising is, obviously, to what level of production is a recovery planned and over what time-period? In December 1993 President Castro spoke of restoring production to 'between seven and eight millions tonnes' over an unspecified but relatively brief time-span. By January 1995, however, he had lowered this target to 'six or seven' million tonnes[67] – a figure echoed by government spokesmen thereafter.[68] The revised figure was about one million tonnes (some 10–20 per cent) below the average production of the 1980s and acknowledged the implausibility of any early return to the output levels of the COMECON era. For harvests up to the year 2000, however, an even more modest target – say 'five or six' million tonnes – seems optimistic.

In the first place, a significant, sustainable increase in sugar production from the low levels of 1993–5 requires a restoration of commonplace good technical practice in both field and factory. This entails first and foremost a substantial improvement in cane-supply conditions. Sugar industry management could be castigated for compounding 'inefficiency' by 'incompetence' and 'irresponsibility'.[69] but the technical and organisational limitations of factory performance cannot be isolated from erratic deliveries of insufficient and poor-quality cane. Alvaro Reynoso, an oft-quoted nineteenth-century Cuban scholar, observed that 'the real sugar mill is the field' – a cogent statement of the fact that improved industrial output and efficiency in the later 1990s depend crucially upon increased, reliable supplies of fresh, mature and clean cane. If combined with an adequate provision of key industrial operational and maintenance

[67] Interview with M. Vázquez Raña, published in *Granma International*, 21 Feb. 1995.
[68] E.g., E. Meléndez, *Granma International*, 7 June 1995.
[69] See report of Castro in *Granma International*, 18 Oct. 1995.

materials, this could also improve the morale of both workers and management depressed by ubiquitous input shortages that shattered links between effort and productivity.

Improved cane-supply conditions in turn depend upon the renovation of plantations with new sowings and the restoration of an appropriate age-structure of ratoons. The yield-improving potential of these will be adequately realised, however, only with greater availability of fertilisers, the activation of installed irrigation capacities, and a general observation of mundane good tillage practices. Substantial renovation of machinery and equipment in harvesting and transhipment systems is evidently required if improved field conditions are not to be offset by instabilities in the delivery of cane from field to factory.

Substantially improved cane supplies also depend crucially on the performance of the new cane UBPCs set up at the end of 1993. Occupying over 90 per cent of state-owned cane lands, they have sheltered their members from the harshest effects of the national economic crisis, most notably by providing food security. Their increasingly labour-intensive cultivation practices, whether in cane or food-crops, have also created new jobs in a national context of high open- and under-employment although workers in the large urban centres have been slow to take advantage of this. But in the last resort their success must be judged by their performance as cane-producers and their progress in this is unclear. In 1995, 77 per cent of cane UBPCs were reported as loss-makers as contrasted with about 50 per cent of UBPCs in non-cane agriculture. The more unfavourable situation of cane UBPCs was explained primarily by the low yields they inherited in 1993, exacerbated by the unfavourable high-cost conditions in which they carried out their first, extended harvests. It was also recognised that while there might be notable year-on-year recoveries from poor yields for annual crops (such as tobacco), the recovery process for cane plantations was inevitably more protracted.[70]

There were also severe incentive problems. When the UBPCs were established, it was envisaged that major improvements in the effort and productivity of their workers and managers would accompany a direct linkage of earnings to self-managed enterprise performance. To this end, as in the CPAs on which they were largely modelled, an important fraction of enterprise profits was to be distributed to members as dividends. The amortisation arrangements within which UBPCs paid for their initial inventories of machinery and equipment were evidently designed to encourage early – even first year – generation and distribution of dividends. Cane price increases seemed to have a similar intent. Yet it was obvious that with inherited low yields, pervasive input shortages and

[70] See interview with Eduardo Chao Trujillo in *Granma International*, 17 Jan. 1996.

enforced harvest extensions, whether or not there were distributable dividends could bear little relation to the intensity of worker effort or the efficiency of enterprise management. Furthermore, where better productive conditions, however caused, yielded distributable monetary surpluses, their efficacy as incentives – for CPAs as well as UBPCs – was greatly weakened by constraints on their real purchasing power. Such problems underlay the complaint, repeatedly noted in 1994 fieldwork, that the creation of UBPCs was a welcome decentralising reform but was also ten years late.

Material scarcities and uncertainties, together with the haste with which cane UBPCs were constituted, also impeded the development of routinised contractual arrangements between growers and their suppliers of inputs and buyers of output. Pre-revolutionary relations between mills and *colonos* had been governed by detailed national regulations, originally embodied in the Sugar Coordination Law of 1937, that specified mutual obligations and imposed sanctions for their non-fulfilment. The latter could be onerous and include loss of tenure for leased lands – a powerful threat for the weaker, small *colonos* in particular. But in contemporary UBPCs output depended upon inputs the supply of which could be guaranteed by no-one and advance contracts agreeing, for example, the delivery schedules of particular quantities of harvested cane could have as little real content as purely monetary calculations of profit and loss.

In such circumstances, the relations between factories and their UBPC (or CPA) suppliers tended to be governed by *ad hoc* 'understandings'. The most crucial of these was that there would be no significant diversions of land from cane to pasture or food crops unless these were sanctioned 'from above'. The lack of detailed institutionalised regulations and controls doubtless reinforced the practice of nominating only 'trusted' members of old CAI administrations for key management posts in the cane UBPCs being set up at the end of 1993. These appointments required to be, and typically were, ratified by UBPC assemblies but it was hardly surprising that there were frequent complaints thereafter that these same managers continued to manage in the same old way, with too much 'tutelage' and too little creative participation. Creative participation no doubt encouraged innovative initiatives needed to cope with input shortages, modified cultivation practices and the deteriorating stock of machinery and equipment. In the last resort, however, the more efficient performance of UBPCs, whether run by administrative fiat or more consultative decision-making, required alleviation of crushing material difficulties originating outside the enterprise.

This in turn raised questions as to the availability of resources for investment in the sugar economy and the priority assigned to it within a

national plan for economic recovery. No official answer was available to either question. On the one hand, a clear assessment of the nation's investment prospects was masked by general economic uncertainty. On the other, within an uncertain national panorama, the priority assigned to the sugar sector was concealed by secrecy, confusion or both. Even so, it was clear that a significant, sustained recovery of the sugar economy required major increases in the material resources of which it had been starved over the period 1991–5. A previous paper concluded by noting the danger that the familiar Cuban dictum – '*sin azúcar no hay país*' – might be reversed and become '*sin país no hay azúcar*'.[71] The 1994/5 harvest of 3.4 million tonnes raw value, following on the 1993/4 low of 4.0 million tonnes, showed how real that danger had become. In preceding years, the failing national economy had swallowed up so much of the foreign exchange earnings generated by the sugar sector that it had been quite impossible for the latter to reproduce itself. At the same time, national import emergencies had imposed sugar production practices that were known to be counter-productive over any but the shortest of time-horizons.

By 1994, despite the disastrous harvest still to come, both domestic and international publications were reporting signs that the worst might be over. The national economic free-fall – GDP was estimated to have shrunk by 35 per cent between 1989 and 1993 – appeared to have been checked, and significant recoveries in some non-sugar activities were reported for both 1994 and 1995.[72] State budget deficits were reported to have fallen from 5.05 billion pesos in 1993 to 775 million pesos in 1995.[73] The key role of the sugar sector in national economic reconstruction and diversification – apparently overlooked by many in the period 1991–3 – was increasingly stressed in official pronouncements and the 1995/6 harvest was predicted to rise to 4.5 million tonnes, or about 30 per cent above the harvest of 1994/5. Cuba's chopper-harvester plant, limited to renovations over previous years, was reported to have resumed production, with 245 new chopper-harvesters scheduled to cut some 10 per cent of the 1995/6 crop.[74] Significantly, these would be powered by Mercedes-Benz engines previously used in Cuba only in Australian harvesters and the same company was reported as a prospective supplier of other harvester parts and equipment.[75] The national press also publicised Ukrainian preparedness to supply cane-harvester engines and

[71] Pollitt and Hagelberg, 'The Cuban Sugar Economy in the Soviet Era', p. 568.
[72] See, for example, the Banco Nacional's *Economic Report* (1994) and *Inversiones y Negocios, 1995–1996* (Havana, 1995).
[73] F. Castro at the National Assembly of People's Power, 26 Dec. 1995, in *Granma International*, 10 Jan. 1996.
[74] *Granma International*, 6 Sept. 1995.
[75] *Ibid.*, 9 Aug. 1995.

tractor parts and better conditions for the supply of Russian parts and equipment for the sugar industry. Barter terms-of-trade for Russian oil and Cuban sugar were reported to have improved to a ratio of 3:1.[76] Gross foreign investment in the Cuban economy as a whole exceeded US$2 billion by the end of 1995.[77] Notable new injections of capital from Australian and Canadian mining interests were reported[78] and South African investment in mining, chemicals, tobacco and the sugar industry was reportedly 'about to begin'.[79]

While such developments suggested improved prospects for national economic revival, they offered no guarantee of a rapid recovery of sugar output to the official targets of 'six or seven' million tonnes. For one thing, political and economic uncertainties in Russia and other ex-Soviet countries, combined with Cuba's limited short-term export capabilities, placed question marks over a number of reported trade projects which were clearly best viewed as possibilities, not plans. Secondly – and probably of greater general significance – the net short-term investible resources generated for the Cuban state by infusions of foreign capital of all kinds were far smaller than their total sum might at first sight suggest. This was primarily because Cuba's general economic situation, while improving, remained parlous. Foreign debt in general and short-term debt in particular was high. Cuba's repayment prospects for new loans were constrained by shrunken export capabilities and the high servicing costs of existing debt. Unrelenting US hostility removed numerous prospective aid, trade or investment partners from the scene and threatened costly sanctions for others.[80] The outcome was a foreign investment climate in which capital recovery was generally both sought and offered 'in the shortest time possible'.[81] and in which Economy Minister Dr J. L. Rodríguez reported typical interest rates on short-term loans to vary from 12 to 20 per cent.[82] In December 1995, President Castro reported US$300 million dollar credits, with interest of more than US$50 million, for sugar industry finance[83] – a total commitment that implied

[76] *Ibid*., 28 June, 25 Oct. and 31 May 1995, respectively.
[77] *Cuba Business*, vol. 10 (Dec. 1995).
[78] P. Fletcher, *Financial Times*, 8 Dec. 1995; *Cuba Business*, vol. 10 (Dec. 1995); *Granma International*, 26 April and 8 Nov. 1995.
[79] *Ibid*., 3 Jan. 1996.
[80] In a recent interview, Carlos Lage reported that the Helms–Burton Law of March 1996 would 'complicate the prospects for economic recovery by slowing the pace of new foreign investment and increasing the … cost … of external financing' (*Financial Times*, 18 July 1996). Even if applied in full, however, he asserted that the Law would not destroy Cuba's capacity for economic recovery. Evidence of the latter was cited in the form of a 1995/6 sugar harvest improved to 4.4 million tonnes, increased tourist arrivals, and a sharp increase in nickel production. Projected GDP growth for 1996 was 5 per cent.
[81] J. Herrara, *Granma International*, 10 May 1995.
[82] *Granma International*, 21 Nov. 1995.
[83] *Ibid*., 10 Jan. 1996.

mortgaging over one million tonnes of sugar exports for repayment purposes. This typified credit agreements in a range of activities where repayment was made directly from the short-term hard-currency sales of the exports they financed.

The effect of all this was firstly to prolong the gestation period between the initiation of foreign-funded projects and their generation of net disposable resources. Secondly, it reduced their overall national rate of return. In so far as this depressed short-term supplies of basic consumer goods, it cut the scope for improving real purchasing power and alleviating incentive problems. By reducing the flow of resources for new investment, it compressed the scale and range of State projects aimed at economic renovation and diversification. The needs of the sugar sector for massive, multi-faceted renovatory investments were obvious, but so was the severity of the constraints imposed upon the investment process by acute national resource limitations. And this in turn focused attention upon certain hard choices that had to be made about the very nature and scope of the recovery process planned for the sugar economy.

It was unclear at the end of 1996 whether or not these choices had yet been confronted. That there was excessive managerial 'tutelage' within some UBPCs has already been noted, but a national seminar for farming cooperatives concluded that a 'lack of autonomy in managerial matters' for UBPCs as a whole was a 'key issue'.[84] As post-1991 events made clear, lack of managerial autonomy was not confined to lower-level cane producers. It held for the management of the sugar industry itself. Like most of the performance indicators of the sugar economy, the instructions it received from above tended to be masked by secrecy and the long-term strategy envisaged for the industry could not be clearly discerned. But some crucial issues were obvious enough. In first place were the criteria to guide the deployment of scarce renovatory investments, in particular whether these should be concentrated on a relatively narrow front or dispersed more widely.

The power of the long-run argument for selective concentration of sugar investment seemed overwhelming. At its heart lay the disintegration of COMECON and of the USSR which had slashed both the profitability of Cuba's sugar trade and the funds available for investment in the sugar economy. In the new conditions, with a dearth of capital and uncertain and often unprofitable sugar markets, it was obvious that available investments should be concentrated in those sugar complexes where agro-industrial conditions offered the best prospects of increases in production at the lowest unit cost. Too exclusive a pursuit of this investment strategy could evidently carry with it significant costs. It was arguable that Cuba's

[84] See *Cuba Business*, vol. 10 (Dec. 1995), p. 3.

intense foreign exchange difficulties justified sugar production even in heavily subsidised, technically inefficient enterprises. Unlike many alternative export lines, moreover, sugar was an anonymous commodity that broke through US-sponsored trade barriers with relative ease. Furthermore, the closure of significant numbers of sugar factories would swell already high levels of under- and unemployment and the non-labour resources released by such a closure programme could be exaggerated. Much physical capital locked up in the factories and transhipment systems of the sugar sector could serve no other purpose. It was less widely understood, however, that the alternative uses of land currently planted to cane could also be restricted: blithe proposals to convert plantations to the production of badly needed foodstuffs ignore the fact that key technical and material needs, in large part imported, for efficient food production and distribution were commonly far greater than those of cane. Finally, if such land was selected precisely because of its poor performance under cane, its best alternative use was most probably extensive livestock grazing.

Such a mix of short-, medium- and long-run costs and benefits suggested the virtues of a strategy of transition, with a graduated phasing out of the least efficient factories and plantations and a progressive strengthening of those agro-industrial complexes with the greatest potential for improvement. If this is in effect the recovery programme for the sugar economy, then it is one that seeks to adapt the industry to the new competitive world conditions in which it now has to operate. If it is not, however, and 'recovery' simply means an indiscriminate attempt to restore sugar production to 'six or seven', if not 'seven or eight', million tonnes, then the answer to the question: 'will there be a speedy recovery of Cuba's sugar economy?' is obvious. There will not be and there should not be.