

REVIEW ESSAYS

On Sugar, Capitalism, and Socialism

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Reinventing the Cuban Sugar Agroindustry. Edited by Jorge F. Perez-Lopez and José Alvarez. Lanham: Lexington Books, 2005.

Sugar has played a significant part in Cuba's history, development and economy. But before sugarcane became a commodity it was a plant, and its characteristics as a plant are the starting point for any study of its uses, technology, economics, and future. As a plant it has a number of relevant features: it is a grass that thrives in high temperatures; it is one of the most efficient collectors of solar energy that we know; it stores energy and protects itself from some diseases by a high concentration of sugar in its vegetative organs so that harvesting sugarcane means removing the whole above-ground plant from the field. This causes it to deplete mineral nutrients more than, say, fruit trees. Thus sugarcane is a renewable resource only in the limited sense that the crop can be replanted or grow back. The underground parts sprout, giving a ratoon crop for a few years without replanting. But the soil is not by itself renewable; it requires replenishment by slow geological processes, by fertilization, or by alternative ecologically sound soil management programs.

As an ecologist reading *Reinventing the Cuban Sugar Agroindustry*, I was first attracted to the chapter by Guilherme Rossi Machado, Jr. on environmental conditions for growth and the wide array of sugar varieties. He shows that varieties can be developed to enhance sugar yields, for fiber or other products; for seasonal pattern; adaptation to environmental conditions of drought, waterlogging, and heat; and pest and disease resistance. The breeding programs make use of the versatility of the cane plant both in its adaptability to different environmental conditions (including the expected changes in the global climate) and as a resource for different products from molasses and sugar to energy, fiber and chemicals. The concept of the biofactory as presented by Sergio Trinidad promotes sugarcane as the feedstock for a modern bio-chemicals industry. Cuba is already using cane derivatives in a variety of industrial uses: as an alternative coolant instead of the ozone-depleting freon, for medicines such as PPG-5 to lower cholesterol, for newsprint, and for generating electricity. Production of ethanol for fuel has lagged compared to Brazil but is now being looked at more closely.

Varieties can also be selected for their seasonal growth pattern so that employment and mill utilization can be spread out further over the year. The discussion by José Alvarez and George H. Snyder of the possibilities of a sugar/rice rotation open up the potential to expand the use of the land beyond export production for domestic food needs, while easing soil depletion, which is exacerbated by growing the same crop year after year. Unfortunately, Alvarez and Snyder focus only on the yield of the sugarcane component rather than consider the value of the rotation as a whole. They report an improved sugar yield from alternating sugarcane with rice but fail to separate the carry-over effects of fertilizer and other agronomic practices applied to the rice from the role of rice itself in the rotation. This is a serious omission, since a comprehensive measurement of economic viability in this system

would have to include the production of the land as a whole if rotations are used, not just sugar yields. Other rotations such as sugar with crayfish culture or sugar with leguminous crops are possible, too, and would fit into the recent trend in Cuba toward diversified farming.

Various aspects of diversification of the industry from diversification of varieties, crops in rotations and industrial products are explored in Chapters 11-17. These overlap and are consistent with thinking on the island. The sugar-rice rotation (Chapter 12) would not only improve production but also serve as a hedge against natural or economic uncertainties. Findlay M. Pate's chapter on sugarcane as a source of feed for cattle (Chapter 13) reinforces the possibility that sugar may play a significant role in the future agriculture. This would be especially useful when a mosaic of land uses is integrated into a diversified development strategy, which would also make organic production more economical. Chapter 14 explores global marketing possibilities and the regulatory systems for organic sugar. Chapter 15 considers sugar as the feedstock for ethanol and energy production. These different perspectives on diversification come together in Sergio Trinidad's discussion of the biorefinery and Jehová Peña's case study of the Dominican sugar industry.

Analysts in Cuba are also advocating diversification within the sugar industry, although there may be differences of emphasis on particular uses of sugarcane and a more holistic approach in the context of Cuban development. The replacement of specialized farms by mixed-product enterprises would allow for lower transportation costs for the inputs produced within the enterprise, such as the recycling of manure as fertilizer and local biogas production. However, spreading sugar production throughout the catchment area of a sugar mill would increase the average distance of the cane crop from the mill.

A range of specific questions about how to grow the crop for the greatest social, ecological, and environmental benefit of the country as a whole begs a larger question: In light of the volatility of world production and the long-term trend toward lower prices for commodity sugar compared to industrial products on the world market, should there even be a sugarcane industry? With sugarcane's potential to be part of an integrated ecological agricultural industry yielding a diversity of products, the answer for Cuba is yes.

This is not a trivial question, because besides being a valuable commodity, sugar has also been a way of life. Throughout the colonial and semi-colonial periods, sugar has been associated with misery, slavery, illiteracy, seasonal unemployment, deforestation, and the overwhelming power of the landlords, often foreign. The historical review by Joseph L. Scarpaci and Armando H. Portella in Chapter 1 emphasizes economics and technology with some reference to deforestation, but little is said about the conditions of sugar workers. The growth of the sugar industry was accompanied by direct foreign political rule or indirect domination and dependence on the caprices of the international markets and politics. Not only in Cuba but also in other Caribbean islands, there has been a deeply felt rejection of the sugar economy coupled with a grudging acknowledgement of its value as a source of foreign exchange as well as a sentimental attachment to the *batey* as a part of the cultural formation of the sugar countries. In Trinidad, Tobago, and Guyana, liberated slaves deserted agriculture for industry, while indentured east Indians moved into farm labor employment. In colonial and neo-colonial times, the only criterion was profit, with callous disregard for environmental impacts, the conditions of agricultural labor, or the national food supply.

Consequently, during that period, innovation was limited to agronomic and industrial concerns.

In post-revolutionary times, the attitude toward sugar went through several mutations. As Perez-Lopez and Alvarez discuss in Chapter 2, after an initial enthusiasm for diversification and industrialization, Cuba fell increasingly under the high-tech “progressivist” orientation that was both the conventional approach to development and the perspective of the Second (Socialist) and Third (Communist) Internationals. High-tech progressivism viewed underdevelopment as a lack of modernization. Capitalism, which promoted the ceaseless expansion of the productive capacity, also impeded its growth in the dependent countries. Therefore, the task of a revolutionary regime was to “modernize” as rapidly as possible, and they did this by adopting the “most advanced” technologies and incorporating the rural population into collective forms of organization that would enhance production and undermine “rural backwardness.” Concern for the environment was expressed more through efforts at mitigation of harmful effects than preventing them. Such a policy expanded production, left agriculture more vulnerable to natural disasters and the loss of imported inputs, and damaged the environment. Production undermined the capacity of the land to produce.

But by the mid-1970s, an ecological consciousness was developing in Cuba and the international Left. Cuban and foreign ecologists joined to promote a radically different approach to development. In Cuba it was led by agricultural and conservation-minded ecologists and the organic agriculture and permaculture movements. After the collapse of the Eastern bloc, ecological consciousness gradually came to dominate thinking to the point where ecology has become a major component of social development and figures prominently in national progress reports on where Cuba is headed.

The basic concept is that development is not a unilinear progression from less developed to more developed but a branching pathway with choices along the way that takes into account who makes the choices and for what ends. A rising standard of living is compatible with sustainability if the standard of living is not measured as unlimited increases in consumption of energy and matter but is instead measured as a rising quality of life. Factors that indicate a good quality of life include good nutrition and housing, health, education, culture, and equity. Political participation and an ecologically and taxonomically diverse landscape that combines reforestation, protection of vulnerable ecosystems, and ecological agriculture also increase the quality of life for the citizenry. Today in Cuba almost all the urban agriculture and a significant amount of all food production is organic, ecological, or at least pesticide-free. However, the sugar industry, under a ministry all its own, lagged in this process.

The Neoclassical Economic View

Economists are used to viewing an industry from the perspective of its owners. This bias is reflected in several chapters which discuss world production and price trends, costs and earnings, market shares, technological changes, and options for products. But very little is said about the conditions of sugar workers, the very rich history of their unions, or the problems of job security and employment. The historical review in the book does not concern itself with questions of the abject rural poverty that existed before the revolution or

with issues of seasonal employment, education, health service, or housing in the sugar communities. These are sensible omissions in the sense that from the conventional perspective in capitalist countries, these concerns are external to the industry.

Consistent with capitalism's habit of ignoring externalities, the environment is mentioned only in the context of soil erosion, depletion and compaction as these affect productivity. But environmental issues on their own do not enter into the economic calculation in this discussion. For instance, the recycling of cane residues as an industrial input is considered in making the enterprise viable as a biofactory, but the costs of river cleanup or building reservoirs for irrigation are not. Yet any evaluation of Cuba's sugar industry must take place in the larger theatre of ecological, economic and social development.

Brian H. Pollitt (Chapter 3) reviews the changing technology of sugarcane production. He details the diversification of varieties, the adoption and abandonment of burning the cane fields for ease of harvesting, the establishment of cleaning stations, mechanization, of cutting and transport, all from a capitalist economic point of view. He also points out the upgrading of the skill levels required for more complex production and says all of these innovations have to be well-coordinated in order to provide benefits:

The key problem that Cuban engineers, agronomists, and their advisors had to confront, and were eventually to master, was that the efficient harvesting of sugarcane required complementary changes in the entire interrelated sequence of productive processes both preceding and following harvesting operations. Such changes also required detailed calculations to be made about the costs and benefits linked to a particular choice of techniques: a choice determined not so much by immutable scientific verities as by the productive resources available in given market conditions. [p. 49].

The trouble is, world market conditions may vary more rapidly than the time needed for developing and implementing particular technical choices to be overhauled. Therefore, only technologies that are robust in the face of uncertainty even make economic sense. Insofar as much of Cuban sugar production is directed toward the national market, the industry is less vulnerable to uncertainty of this kind.

As is true for the other chapters, here, too, the demography of the working class is missing. As a result both of improved health and declining fertility, the Cuban population is aging. Agricultural field work is physically exhausting. Furthermore, the Cuban *campesino* is much too educated to be content with a lifetime of wielding a machete. The net result is a secular trend toward urbanization, the drift of population from the countryside to the cities, especially Havana. Urban migration was partially reversed during the worst of the Special Period years when living on a farm was a way of assuring food. Furthermore, urbanization has been discouraged by national policy throughout the revolutionary period so that Havana would not become a megalopolis such as Mexico City or Mumbai.

Any analysis of the future Cuban sugar industry has to examine the changing demography. Social programs since 1959 have given enough priority to the countryside so that there is little rural/urban gap in health indicators or educational levels. Pollitt notes that the changing technology that eliminates unskilled jobs creates new employment

opportunities for well-educated and skilled workers who would otherwise have moved to the cities. But there is no discussion of occupational health and safety, which must also be considered when designing technology to make farm work more attractive. The Ministry of Science, Technology, and the Environment (CITMA for its Spanish acronym) lists the humanization of work as one of its prioritized long-term research goals. Perhaps even more important is the organizing of work in ways that increase the autonomy of the workers. This is a long-term issue relevant to health, participation in social and political life, innovation, and rural-urban migration.

Technical planning must also take into account the creation of employment for women. Women have traditionally been underrepresented, especially in the industrial side of sugar production. This is changing with the opening up of more skilled jobs. In other branches of agriculture, the spread of the *organopónicos*, *intensivos*, *casas de cultivo* (greenhouse-type structures under mesh) and the CREE (centers for the production of the natural enemies of pests) open up new opportunities for women. I do not know the extent to which the old sugar farms have taken up these innovations, but they should be included in the analysis of changing technologies.

Pollitt's analysis of the problems of sugar production led him previously to argue that

...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 agroindustrial conditions offered the best prospects of increases of production at the lowest unit cost ... [with a] graduated phasing out of the least efficient factories and plantations and a progressive strengthening of those agroindustrial complexes with the greatest potential for improvement.

His arguments appear to have informed the discussion for the restructuring of the Cuban sugar industry in 2002. Cuba has, thus far, continued to see sugar as a major source of foreign exchange, so costs and prices weighed heavily in the discussion. And like their counterparts throughout the world, Cuban sugar economists operate in a discourse of production, costs, supply, and prices, where they are constantly trying to predict the trends in each of these variables.

Consistent with such a narrow focus, “technology” in the context of the sugar industry conventionally refers to the mechanical instruments used in the field and mills and does not include the technologies of crop protection from pests and diseases, or water management. But specifically because the strategy of ecological development is such an important aspect of Cuban long-term planning, that definition of technology is inadequate.

In the Cuban context, technology involves a much more comprehensive approach. For example, with pest and disease control, “technology” is used to mean moving away from the prescriptive, “magic bullet” approach of pesticides—even the least toxic ones—to developing biological control methods where natural enemies are produced and released with the objective of helping to create conditions that enhance a diverse ecosystem that is naturally robust in the face of new challenges. As is common with organic agriculture, this ecological agriculture system includes multiple levels of crop protection based on a diversity of land uses, crops, invertebrate and vertebrate elements of the community, beneficial fungi, nematodes and bacteria, ground cover, and the use of livestock for weed suppression and

control through consumption of harmful insects. Fertility is enhanced by nitrogen-fixing bacteria, mycorrhizae that mobilize minerals, use of compost and worms in producing compost, and crop rotation. Animal traction is integrated with mechanical traction according to land and climate conditions. It is one of the exciting developments of Cuban agriculture as a whole, and considering its success, these agroecological practices are likely to spread increasingly into sugarcane.

From the Socialist Perspective

The question for socialist planners is different from that faced in capitalist economies. Rather than focusing only on how to maximize profits in the sugar industry, socialist planners have to ask: “What is the best use of the land for sustainably meeting the immediate and long-range needs of the population?” Economic viability is certainly necessary and is one of the goals for earning foreign exchange, but it is not the whole point of it all. Trinidad refers to some of the non-economic considerations in planning for the future of the industry:

As Cuba assesses the prospects for its sugar agroindustry, it should consider the economic merits of sugarcane-based proposals using as criteria impacts on the local and global environments, low-investment job creation and rural development. . . . [P]ure economic considerations fail to take into consideration:

- The contribution of ethanol in reducing oil imports and foreign exchange outflows in a highly indebted country such as Brazil;
- The higher value of ethanol as an octane booster;
- The superior environmental characteristics of ethanol compared to oil products; and
- The carbon recycling capability of sugarcane ethanol. [p. 281-282.]

But even this step toward a holistic approach is limited. A socialist economy has to consider a broader scale of effects of its policies. In both economic systems, efficiency is an important consideration. But “efficiency” is not an objective universal measure, since there are fewer externalities under socialism. For example, pollution of the rivers is a cost to the society as a whole, so the cost of either cleaning up the pollution or preventing it in the first place is included in a socialist economic equation. Regarding farm labor costs, downsizing may improve the bottom line of an enterprise, but since there is a societal commitment that everybody eats, there is no net saving unless other occupations are found for the displaced workers. When considering whether to expand sugar acreage, socialist policymakers must also take into account whether increasing sugar plantings would remove enough land from domestic food production to increase food dependency. These examples illustrate that the criteria for decisions about the sugar industry are embedded in a larger domain than would otherwise be considered as externalities.

The Cuban sugar industry lives in the dual world of Cuban socialist planning and a world capitalist market, both of which inform decision-making. In Chapters 4 and 5, Hagelberg looks at the history of Cuba’s international sugar sales, while Sergey Gudoshnikov examines world trends in production and consumption. Several features are especially relevant: a slow increase in world production and consumption, mostly in the developing countries; improvements in agronomic and industrial technology; a secular trend downward of prices but with a twofold variation along the way; the increasing dominance of Brazil in the world market; and uncertainties associated with non-food uses of sugarcane. A gap in

this discussion is its failure to consider the effects of world climate change on production through both rising temperatures and altered and more variable rainfall patterns, which add uncertainty about changing microbial and insect communities.

It is unfortunate that this book does not have a chapter on research capacity and strategy in the sugar industry. Sugar research takes place within the institutions of the Ministry of Sugar (MINAZ) but also in the universities, CITMA (*Ciencia, Tecnología y el Medio Ambiente*), MINAGRI, and other sites. MINAZ's currently stated goals of research are "to promote and develop a diversified, competitive and ecologically sustainable agro-industry with a margin of profit." These goals are reflected in a very broad program of agronomic, industrial, economic and social research that emphasizes cutting costs and energy consumption, integrating forestry and ranching into the production system, improving the living conditions of the sugar workers, environmental protection, adaptation of varieties for a diversity of ecological conditions, and protection against pests and diseases, especially those of exotic origin. This last refers to the Cuban experience with outbreaks of sugarcane smut and rust, both thought to have been introduced deliberately in the late 1970s as one of the many efforts over more than four decades to undermine the Cuban economy. CENSA, the *Centro Nacional de Sanidad Agropecuario*, was organized in large part to confront biological warfare, and its director, Rosa Elena Simeón, became the first minister of CITMA. The present scientific staff of the sugar industry is well-educated, aging, and under-financed, with an investment of some 10,000 pesos per investigator compared to perhaps ten times that much in the United States. The new generation of researchers is being prepared with a more holistic, integrated view of agriculture, the environment and social relations than previous *ingenieros agrónomos*.

The missing chapter would also discuss the weaknesses of Cuban sugar research, including obsolete research equipment, insufficient resources and inadequate communication between producers and researchers. Besides enabling research to be more appropriately focused on the needs of producers, improving communication could also help to make sure that producers were able to utilize the results quickly.

A discussion of research also should take into account the historical background, the evolving Cuban commitment to science, and the dilemma faced by all developing countries: how to be part of a rapidly advancing world science while maintaining its intellectual autonomy; how to partake critically of the shared agenda of the international scientific community while also creating its own agenda, academic curricula that balance broad overview with special knowledge and skills, and systems of recruitment and reward.

Cuban agriculture has been recovering rapidly from its low point from the early 1990s to 2003. Both the yield per hectare and the yield per worker have been increasing in Cuba from low initial levels for all major agricultural products except sugar. These rates of improvement are greater than those for most competitors except for Brazil. Thus the lag of productivity in Cuban sugar production seems to be much more a matter of the peculiarities of the sugar industry as both an agricultural and industrial enterprise with a high demand for capital than of the general characteristics of socialism or central administration, the preferred culprits of Perez-Lopez and Alvarez.

In the preface the editors lament the lack of participation by authors from Cuba. This is a major weakness of the book, but given its anti-socialist slant, it is also understandable. The introduction and conclusions take for granted a capitalist restoration in Cuba. Thus the restructuring of the industry, initiated in 2002 is described as follows:

Cuba's socialist government has undertaken a massive "restructuring" of the industry, sharply reducing agricultural and industrial capacity, and in the process idling over 100,000 workers and adversely affecting scores of agricultural communities...It leaves intact the land tenure system and state control over agroindustry resources and decision-making because it is predicated on the socialist principle of state ownership of the nation's resources and centralized decision-making. *Reinvention*, in contrast, aims to create a competitive and profitable agroindustry on the historical foundation, but it would contemplate systemic structural changes such as private ownership, privatization, flexible and independent decision-making by production units, truly independent sugarcane cooperatives, state intervention restricted to regulation of the industry (rather than the current management role), and freely operating labor and input markets." [p. 3 and p. 161.]

In the context of U.S. President George W. Bush's presentation of a detailed scheme for "transition" in Cuba, it is no wonder that collaboration between participants and opponents of Cuban socialism in an endeavor of this kind would be extremely difficult.

The assumption of a capitalist production system is not simply a political preference. It is a bias that colors the way in which problems are posed or ignored, variables are defined, what is measured, and how goals are determined. For example, terms such as "subsidized prices" are used to describe the prices the former Soviet Union paid Cuba for sugar. They were subsidized in the sense of being above world prices, but they could just as easily be described as "closer to fair prices," which would highlight the fact that agricultural commodities—including sugar—are subsidized by the public in capitalist countries to the great benefit of powerful agribusiness corporations, increasingly at the expense of commodity-producing countries, particularly in the periphery.

Another common term of neoclassical economics is "price distortions," which carry a pejorative connotation. Price distortions refer to prices that deviate from the prices that would obtain in a market economy. But from a socialist point of view market prices themselves can be regarded as "distorted" in two ways: they depend on the relations of power that create and own the markets, and they break any relation between market value and use value. In Cuba, if something has a high use value but low economic value (such as sweet potatoes), then in order to guarantee a living income to farmers while assuring supplies to the populace, the prices farmers receive have to be above the prices the public are charged. But in order for the economy as a whole to be in balance, it means that luxury goods have to be priced far above production costs. The anomaly then is the inverse relation between social use value and exchange value. The Cuban public is very resentful of the high prices in the supply and demand markets, so that state markets and markets run by the *Ejercito Juvenil de Trabajo*, Cuba's Youth Labor Army, have been introduced to undersell and therefore "distort" market prices. Any analysis of a socialist economy with only the tools of capitalist economics is bound to be unreal, and thus distorted itself.

While the downsizing of an enterprise in a capitalist economy is an improvement in "efficiency" and the bottom line, this is not true in a socialist economy where it is guaranteed that everyone eats and has a roof and health care. The restructuring of the sugarcane

industry certainly reduces employment in the cane fields and the closed mills; the program as a whole also creates employment in alternative land use for the production of food crops, forestry, vegetables, and stock-raising. The diversification of sugar products opens up industrial employment, and displaced workers are also given the unprecedented opportunity to study. Though these matters are mentioned in Chapter 8, they are apparently of secondary interest to the editors. In the preface where the authors briefly identify what they see as the essential social features of the restructuring, they only mention “idling 100,000 workers and adversely affecting scores of agricultural communities.”

The anti-socialist bias in the book as a whole leads to other errors. State ownership as such is not a “socialist principle.” The socialist principle is ownership by the “associated producers” through state, local government, and cooperative enterprises. The balancing of the local autonomy of cooperatives and their collective responsibility to society as a whole is something to be worked out in practice, and, in fact, recently it has been the subject of prolonged negotiations between the cooperative sector and the state rather than something resolved by abstract principles.

Central ownership and management of immense enterprises does not necessarily mean uniform practices over large areas of monoculture. Though this has often been the reality in Cuba and the east European socialist bloc, China and Vietnam did not emphasize this model. Because of the recognition that the unit of production is not the same as the unit of planning, socialist planning opens the way for a more comprehensive and diverse use of resources. For example, when considering water, planning has to be on a large enough scale to balance the seasonal demand for and availability of water throughout a drainage basin. When looking at labor, socialist planners must consider the region within which labor can conveniently move. They should also balance crops with different environmental sensitivities as a hedge against uncertainty and include enough diversity to meet local consumption needs and commitments to national supplies and international trade. Some land uses are less profitable than others but contribute to the productivity and sustainability of the whole. Therefore, in order to maintain equity and allow internal diversification, the units of remuneration have to be larger than the units of production, which depend more on topography, microclimate as affected by land use, the synergisms between patches of different vegetation, and the mobility of pests, pathogens and their natural enemies.

Cuban agriculture is evolving toward the mixed enterprise with a mosaic of land uses. But the coordination of a large number of different operations simultaneously is immensely complex and requires both the special skills of management and collective decision-making at multiple levels.

Socialism, like capitalism, has many variants and diverse experiences, some relatively successful and some disastrous. The authors rightly would not attribute the demise of the sugar industry in Puerto Rico or the ups and downs of the industry in the Dominican Republic to generic “capitalism,” though they are eager to blame socialism as such for the weaknesses of that industry in Cuba.

The discussion in Chapter 10 of trade liberalization, Cuban entry into the World Trade Organization and treaties such as the North American Free Trade Agreement (NAFTA), privatization, creation of a labor market (that is, restoring labor power to its

status as a commodity), the restriction of the state to a regulatory role, and claims against expropriated property all fall within the domain of “political economy fiction” and therefore are of little interest for a discussion of the future of the Cuban sugar industry.

Overall, the experience, knowledge and insights of the authors of this book make it a useful update for students of the sugar industry. Unfortunately, the book is limited by the traditionally narrow scope of conventional (capitalist) economics and an anti-socialist bias. Thus, its projections for the future of the industry are irrelevant because of the revanchist fantasies of the editors.