

# VU Research Portal

## Sugar crisis

Clemens, H.; de Groot, J.P.

1989

### **document version**

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

### **citation for published version (APA)**

Clemens, H., & de Groot, J. P. (1989). *Sugar crisis*. (Serie Research Memoranda; No. 1989-14). Faculty of Economics and Business Administration, Vrije Universiteit Amsterdam.

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

### **E-mail address:**

[vuresearchportal.ub@vu.nl](mailto:vuresearchportal.ub@vu.nl)

ET

74

05348

1989

# SERIE RESEARCH MEMORANDA

SUGAR CRISIS

A COMPARISON OF TWO SMALL PERIPHERAL ECONOMIES

Harrie Clemens

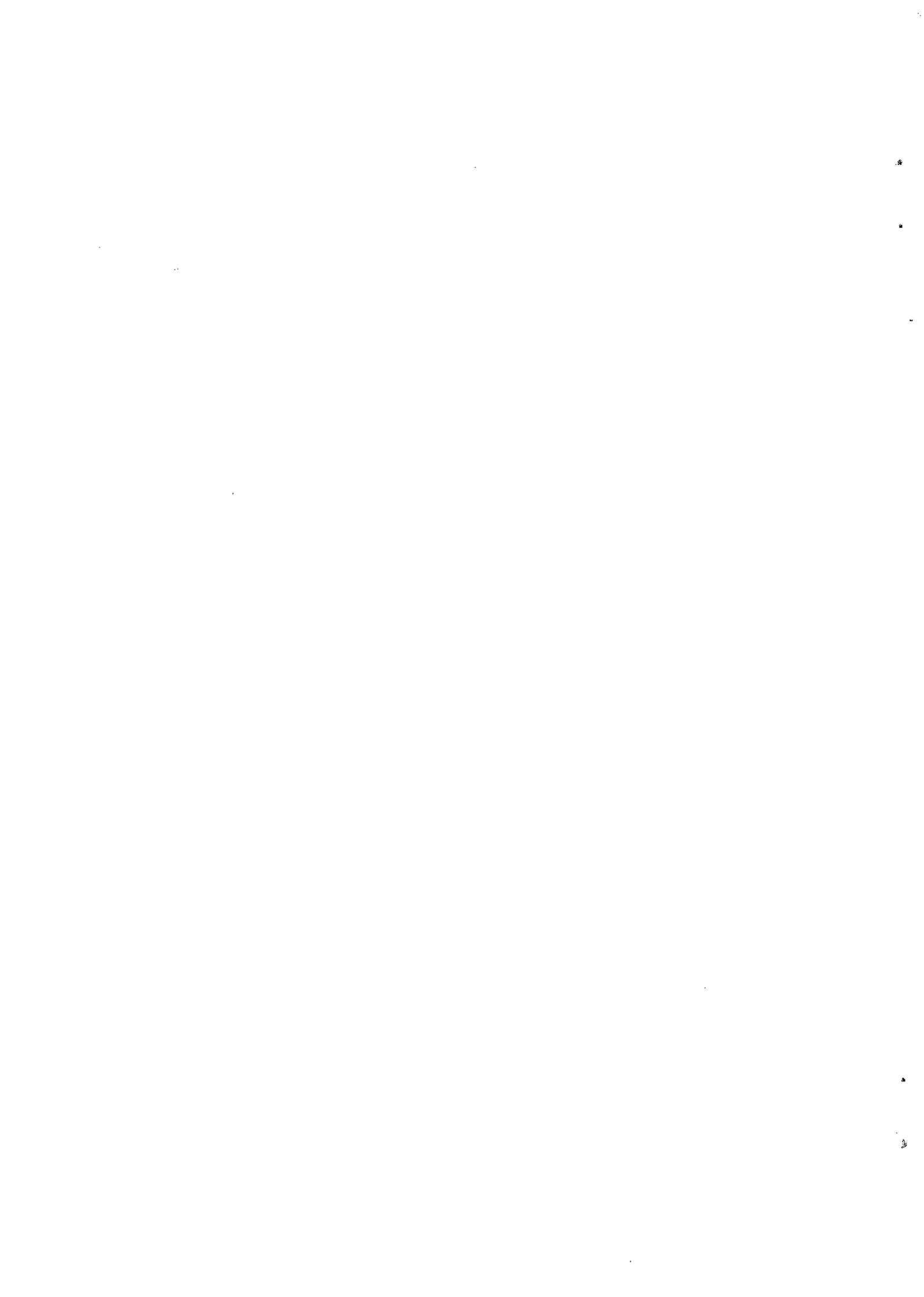
Jan P. de Groot

Researchmemorandum 1989-14

maart 1989



VRIJE UNIVERSITEIT  
FACULTEIT DER ECONOMISCHE WETENSCHAPPEN  
EN ECONOMETRIE  
AMSTERDAM



Sugar crisis

A comparison of two small peripheral economies

Harrie Clemens

Jan P. de Groot

CONTENTS

1. Introduction
  2. The Dominican Republic: the case of a capitalist peripheral economy
  3. Cuba: the case of a socialist peripheral economy
  4. Comparison of the Dominican and Cuban sugar cane sector
    - Role of the agro-export sector
    - Choice of techniques
    - Labor market strategy
    - Type of state
    - Accumulation
    - Labor relations
    - Sugar crisis
  5. Conclusions
- References



## SUGAR CRISIS, A COMPARISON OF TWO SMALL PERIPHERAL ECONOMIES

Harrie Clemens and Jan P. de Groot

1. Introduction

Specialised sugar producers such as the Dominican Republic are hit hard but unevenly by the sugar crisis; the impact varies with dependency on the 'free' world market for sugar. The Dominican Republic saw its quatum in the preferential US market reduced from 447,100 metric tons in 1983 to 145,200 in 1987 and increased the proportion of exports to the free world market where prices are unprecedentedly low. Cuba on the other hand, by extending its trade agreements with the Soviet Union, Eastern Europe and recently also with China, reduced its share of free market sales from about 40 percent in 1971-1975 to less than a quarter in 1981-1986. Still, the free market is important for Cuba because the country needs the convertible currency for imports from the non-socialist world.

Actually the world sugar economy is characterised by a structural surplus in production capacity. A diminishing demand for sugar in the industrial economies concurs with support policies on the supply side: in the US and the EC to maintain farmers' income, in developing countries to substitute sugar imports. As a consequence international sugar trade has contracted, sales under preferential arrangements as well as those on the free market decreased. Profitability in the sugar sector always depended on short periods of high prices in the sugar-cycle, but the interval between peak-prices is getting longer. One can expect also that each following peak will be lower than the preceding one, because supply and demand now react faster to price fluctuations (Harris, 1987:132). World trade more than before consists of refined sugar, the export of raw sugar depends to an increasing degree on special supply agreements with refineries in the United States, the Soviet Union and the European Community. For small exporters the preferential arrangements with these blocs are crucial to their survival.

The Dominican Republic has experienced another crisis. As a result

of the downfall of the Haitian dictator Duvalier early 1986, the over 15,000 seasonal workers who year after year left Haiti for the Dominican Republic to harvest sugar cane stayed at home. This decision made clear once more the fact that contract labor had been crimped and highlighted the role the dictator and his repressive apparatus had played in this process. Meanwhile, in the Dominican Republic emergency measures were taken to bring in the harvest; soldiers and government personnel had to be employed. These events raise the question why a country such as the Dominican Republic had become completely dependent on manual labor, and more specifically on foreign labor for the harvest of its main export crop, whereas Cuba mechanised more than 75 percent of its cane harvest. Beyond the comparison of these two cases is the question of the pursuit of technical change in peripheral agriculture.

The study of innovation requires identification of the actors who bring about technical change, analysis of the socioeconomic structure in which they operate, and their position within that structure. The actor is the one who makes decisions with respect to the innovation. But actors differ in their capacity to take decisions. If the actor is a small farmer his capacity to change production methods is often limited by his lack of information on or access to relevant innovation. If the actor is an organisation of some weight - as is the case of a State Sugar Board treated in this paper - the capacity to decide on such innovations is much greater. So within one and the same socioeconomic and political system the capacity of different actors to innovate varies according to their positions in that system. But the character of the socioeconomic and political system itself also strongly conditions the innovative activities. Actors in comparable positions in different systems can display differing choices determined by the respective systems in which they operate.

Edquist (1985:77) analysing technical change, in particular choice of technique, defines the conditions for an actor to succeed and emphasises the structural factors mentioned above. In his analysis, the choice of techniques can only be explained by considering both the actors and structural factors, giving in each case proper weight to both.

For an actor to develop or implement technical change, or - in the

terms of Edquist - to become a 'social carrier of technique' there are various conditions. This social entity must have a subjective interest in implementing the new technique, it must be well organised to make decisions regarding the technique and the proper use of it. It must have the power to implement the technical change, it must have information about the existence of the technique, have access to it, and have knowledge of operating and maintaining the technique. So, when a certain innovation is available it will only be implemented when there is an actor with at least a subjective interest in it and sufficient power to introduce it. In this paper structural factors are emphasised, showing in particular how different socioeconomic structures condition the choice of techniques.

The argument will be developed for the case of sugar cane production in Cuba, as an example of a socialist peripheral economy, and the Dominican Republic, as a capitalist peripheral economy. In both countries sugar production is highly important for economic growth as it is the main contributor to foreign currency earnings. In the two countries the sugar sector is largely nationalised, facilitating state control over capital accumulation. But large differences can be noticed in the choice of techniques in cane production between the two countries. Cuban cane production and harvesting are highly mechanised; in the process of mechanisation, employment in this sector has decreased substantially but has improved qualitatively. In the Dominican Republic mechanisation is limited, harvesting is still done entirely manually; employment in the sector has continued to be high but at the same time low productivity has been maintained. It will be argued that the different choice of techniques in the two socioeconomic structures has strong implications for future prospects of the cane sector, and the economy in general. In Cuba a sequence of innovations has been induced which serves as a foundation for selfsustaining growth, while the Dominican economy remains to be dependent on the availability of cheap labor.

In Cuba the state and state enterprises have acted as a 'social carrier of techniques' that introduced labor saving innovations in cane harvesting. This can be attributed to the product market; following the 1963 US-embargo Cuba found a stable outlet for its sugar exports in the socialist bloc with long-term contracts and remunerative prices. It

can also be attributed to the ideology of the state, which favors modern technology and the improvement of labor conditions in cane harvesting. But, as will be argued, the main determinant seems to be the situation on the labor market: in socialist peripheral economies the labor market policy of the state results in tightening of the labor market. In Cuba this has resulted in a spurt of mechanisation of cane cutting as this was necessary to maintain and expand sugar production.

On the other hand, in a capitalist peripheral economy the state aims at keeping an ample labor supply, especially of seasonal labor. In the Dominican Republic this is realised by a segmentation of the labor market. Low-paid Haitian cane cutters are contracted, a policy associated with racial discrimination and a division of the working class. The introduction of labor saving techniques has been postponed, as the actors with the eventual power to introduce them, the state and the state enterprises, lack sufficient interest in doing so.

The Dominican Republic has reacted to the world market crisis by closing several of its sugar enterprises and allocating land to alternative export crops or import substitution. In view of the structural factors that dominate the crisis, the state and sugar companies this time were not prepared to continue the accumulation of losses. Moreover, the Dominican Republic's high foreign debt requires more foreign exchange earnings than the sugar sector can supply. Notwithstanding the decrease of the area under cane, the labor problem has not been solved, the State Sugar Board (CEA) aims to come again to an agreement with the new Haitian administration on contracting seasonal labor (El Nacional, 6-2-1988).

While in the last two decades the Dominican Republic and in particular CEA simply maintained their sugar sector to extract a surplus, Cuba invested heavily in its sugar branch. Investments and innovations were made in agriculture, among others in cane harvest mechanisation, and in the sugar industry. The preferential Soviet-bloc markets provided a stable base for this development, but Cuba also wants to sell part of its sugar on the world market to earn a hard currency income. Low sugar prices for those sales were one of the factors which in 1986 caused a fall of nearly 50 percent in Cuba's convertible currency earnings, which implied severe shortages of imported inputs. As Zimbalist (1988:11) puts it, this greatly

diminished the possibilities for material incentives which make the economy to function properly. The access to preferential markets for three quarters of its sugars exports and the substantial investments made in the sugar sector are important considerations for the Cubans not to limit their sugar production. Given the gloom prospects for world sugar demand this policy is not without risks. Through forward and backward linkages the sugar sector is substantially integrated in the Cuban economy. This makes it difficult to cut back on sugar production because of the consequences in related branches, but it raises possibilities for self-sustained growth as new opportunities for accumulation are created.

The paper starts with a short description of the two cases, the Dominican Republic in Section 2, and Cuba in Section 3. In Section 4 a comparison will be made with respect to the role of the agro-export sector in the economy, the choice of techniques in cane agriculture, the labor market strategy, the type of state, and the resulting accumulation model and labor relations. The conclusions are summarized in Section 5.

## 2. The Dominican Republic: the case of a capitalist peripheral economy

In the last quarter of the nineteenth century a modern export-oriented sugar sector developed in the Dominican Republic (Boin and Serulle 1981:36). From the beginning of this century seasonal labor was provided by migrating laborers from the English-speaking Antilles. After the 1916 occupation of both the Dominican Republic and Haiti by the United States, seasonal labor was contracted in Haiti, as is the case today (Carreño 1984:117).

The need for large numbers of seasonal workers that characterises the sugar cane harvest produces extremely miserable labor conditions. Cane cutting is an arduous and low-paid job, done by workers who lack other employment opportunities. Employers have an interest in limiting alternative opportunities for peasants and workers by restricting access to land. Left without income generating opportunities in the off-season, workers are willing to cut sugar cane in the harvest

season. Employers also used to employ foreign migrating laborers, as expatriate workers represent a politically weak and in fact a vulnerable labor force. In the Dominican Republic the Haitian cane cutters are discriminated in the labor market. They are cheated in their piece rate wages and they are repressed in order to prevent their becoming organised. The gap between the several segments of the labor market has widened. Dominicans look down upon cane harvesting 'as work for Haitians'.

The sugar sector contributed to the disarticulated character of the Dominican economy. The sugar industry formed an enclave with very few links to other sectors of the national economy. But apart from this sectoral disarticulation there was also a social disarticulation (De Janvry, 1981:34) as economic growth was not oriented toward the development of consumption of the Dominican peasants and workers. They were seen one-sidedly as a source of cheap labor, ignoring their role as consumers who, by increasing demand, can stimulate economic growth. Large concentrations of landholdings, a consequence of land appropriation by the sugar companies, involved the expulsion of peasants from their land and played an important part in the origin of land-tenure relations that contributed to the unequal character of the development process.

After the death of the dictator Trujillo in 1961 his sugar possessions, which included 12 of the 16 sugar factories in the country, were confiscated by the state, and since 1966 these have been managed by a state board, the Consejo Estatal de Azúcar (CEA) (Cassá 1982:234). The state is not behaving very differently from a private firm that aims at short term profit maximisation without considering macro-economic aspects or long-term development. Because of political favoritism, efficiency is low. Economic surpluses - especially when export prices are high - are transferred to the public budget; leaving the sugar board over the years practically without funds to reinvest (De Groot 1986:12).

Since the 1960s, the number and the proportion of landless laborers and especially of minifundistas has increased due to a dualistic development between peasant and capitalist agriculture. This has resulted in an increasing supply of semiproletarian labor, as small farmers are forced to supplement the income from their own plots with

wage labor. In the agrarian labor market quite a clear differentiation can be observed between semiproletarian peasants, landless laborers, women, and Haitian workers. Haitian migrant laborers present a distinguishable segment at the bottom of the labor market, providing cheap labor that puts pressure upon the labor market.

In the Dominican Republic supply in the agrarian labor market largely exceeds demand. But the demand for seasonal labor in agriculture seems to have increased. Capitalist farmers using modern production methods have applied more labor per hectare in wage food crops, such as rice and in sugar cane, than have peasant producers. This higher labor intensity was limited to such seasonal operations as transplanting of rice and harvesting of sugar cane. In the 1980s, harvest operations and traditional transport by ox-cart of sugar cane required about 60,000 seasonal workers. About 80 percent of this seasonal work is done by Haitians, most of whom have resided for years in the Dominican Republic, but over 15,000 are contracted annually by CEA in Haiti. The picture that emerges is one of higher seasonal labour peaks especially in capitalist farms and in commercial crops (Buitelaar & De Groot 1985:83).

The government labor market policy contributed to a continuous and ample supply of seasonal labor by limiting the redistribution of land, by restricting the small farmer's access to credit and other governmental programs, and by contracting foreign migrant labor, with the objective of keeping wages low so as to benefit the capitalist farmer in his pursuit of the export market.

Over the past 25 years the techniques used in the cultivation of sugar cane in the Dominican Republic have changed unevenly. Soil preparation, planting, and cultivation have largely been mechanised, whereas harvesting has remained almost completely a manual operation. Soil preparation which in the early 1960s was carried out by oxen and plow, is now mainly done by machine contractors; weeding, formerly a manual operation, nowadays is done by the application of herbicides. But the traditional way of harvesting has changed very little: all cane is cut by hand, and only about 10 percent is loaded mechanically (GEPLACEA, 1983:67).

Within the Dominican Republic there has been an extended discussion

about the need to change techniques in sugar cane harvesting. For a long time it has been realised that there is a considerable political risk involved in depending largely upon a foreign labor force for the harvest of the main export crop. Attention has frequently been focused on the 'paradox' of importing foreign labor while at the same time suffering from substantial unemployment. However, the contracting of a foreign migrant labor force depresses wages and keeps the cost of cane cutting at a low level. Replacement of Haitian cane cutters by Dominican workers would be accompanied by an increase in labor productivity, which can be attained by mechanisation or by modification of the traditional harvest method.

Mechanisation of cane cutting seems to be unprofitable as long as cheap labor is available. Moreover, the decline over the last 25 years of the average cane yield has made prospects for mechanisation, at least in part of the area, even less attractive. Mechanisation of the cane harvest requires adjustments in the total system of cultivation and requires an extended period of preparation. Up till now the state sugar board, CEA, which in this case can be defined as the potential 'social carrier of technique' has shown little interest in this innovation. But as presently Haitian seasonal workers do not migrate in sufficient numbers the labor scarcity is more severe than before 1986. In the 1987/88 harvest CEA reported a shortage of some 7000 cane cutters and after some experimentation last year it has now started to deploy four combine harvesters in Ingenio Quisqueya (Listin Diario, 2-3-1988).

Modification of the traditional harvest method includes two elements. First, the traditional chopper must be replaced by an improved one that is longer and thereby demands less stooping of the cane cutter and enables cutting several cane stalks at a time. Secondly, the work must be organised in teams facilitating a division of labor between cutters and loaders, who take turns at the jobs. Experiments have been carried out successfully on a number of CEA plantations (Latorre et al., 1984:144). It is not easy to understand why such a measure to increase labor productivity has not been introduced on a large scale. One of the aspects CEA seems to fear most is that the new system tends to organise labor in working teams, that could provide a basis for further organisation of the workers,

something fiercely opposed by the sugar board (Plant, 1987:121). Another aspect is that a successful implementation of this innovation requires substantial improvement of the transport of cane from field to factory. The large number of ox-carts used, the shortage of train wagons and lack of logistics make this condition hard to fulfil. The introduction of the improved method would make it possible to reduce dependency on the foreign labor force because of its labor saving effect. The moment could not be more appropriate for such an innovation. More Dominican workers could then be employed for more productive jobs. If more nationals are to be employed, however, not only should wages be increased, but work and living conditions must also be improved (Moya Pons, 1986:140). The productivity increase resulting from a change in the traditional harvest method might be insufficient to pay for this. Thus CEA has opted not really to change the traditional method; it prefers to continue the contracting of large numbers of seasonal workers from abroad. According to the vice-president of the Republic Morales Troncoso, who is heading CEA, the country needs to renew the contract with the Haitian government on the provision of seasonal labor. The Dominican state so far has not pressed CEA to introduce labor saving techniques in cane harvesting and to bring in more Dominican workers. It appears ultimately more interested in maintaining an abundant supply of cheap labor than in creating productive employment for Dominican peasants and workers.

At the enterprise level the introduction of mechanisation of the cane harvest in the Dominican Republic is postponed as long as cheap foreign labor is available. But at the same time, mechanisation requires a prolonged preparation period in order to bring about the necessary adjustments. Central Romana, the largest private producer, is following this strategy; the company is preparing itself for mechanisation to be achieved in three stages: mechanisation of the cultivation of the crop, of cane loading and finally of the harvest. Fields and water courses are gradually adjusted in order to be ready for a fast introduction of a complete mechanisation (Morales, 1981:43).

Capital can be accumulated either by appropriating resources or by extracting a surplus from existing production. Capital accumulation is the basis for survival and expansion of the capitalist enterprise. It

is also an important condition for economic growth, as capital is used for diversifying the economy and increasing labour productivity, which is the basis for higher wages and incomes.

In the Dominican sugar sector, capital has been accumulated mainly on the basis of cheap seasonal labour. The state has shown more interest in extracting a surplus from a foreign labor force, than in promoting a process of selfsustaining growth based on productivity increasing innovations in the sugar sector, whether by improving the traditional harvest method or by mechanisation. In particular, mechanisation would require investments in land and labor saving facilities, which CEA has been unable to make because its surplus is systematically withdrawn by the Ministry of Finance.

At the moment the possibilities for innovation, which would require considerable investments in modernisation, are limited, particularly because of the gloomy prospects of the world sugar market. In the last few years the state sugar sector has hardly provided any surplus to the Dominican development process.

CEA has now made a start with the implementation of its plan to close six of its 12 sugar factories; since early 1987 five mills have been shut down and one is transformed to produce liquid sugar. In 1986 these plantations, including their outgrowers, comprised 27 percent of CEA's cane area and contributed 22 percent of its sugar production. The State Sugar Board is allocating former cane land to alternative activities. It rents out land to or associates with exporters who are taking advantage of the duty-free entry provided to US markets under the Caribbean Basin Initiative by growing non-traditional vegetable and fruit crops. Alternative activities are likewise developed for the internal market: fruits, African palm, soghum and livestock. Part of the land was sold for tourist development and three Export Processing Zones are under construction on CEA grounds. Finally, part of the land taken out of cane production is distributed by the Dominican Agrarian Reform Institute; beneficiaries receive plots of about two hectares, insufficient land to eke out a living. The closing of the sugar factories implies a substantial loss of state owned capital; in future the Dominican state will at best control part of the surplus to be generated in the alternative activities.

Private sugar companies, Central Romana and Vicini, also cut back their

production. Vicini closed down two of its three mills and Central Romana slightly reduced its cane area diversifying land to livestock, fruits and vegetable crops. In the Dominican Republic cane land is thus increasingly allocated to other export crops, using new sources of cheap, seasonal labor, in particular women, thus starting another cycle of disarticulated growth.

### 3. Cuba: the case of a socialist peripheral economy

Before 1959 sugar production dominated the Cuban rural labor market, as it dominated the Cuban economy in a general sense. In the 1950s, 50 percent of the economically active population in agriculture worked in the sugar cane during the harvest season. After the crisis of the early 1930s hardly any foreign labor was utilized, and high labor requirements in cane cutting were met by domestic agricultural workers. A very high proportion of these workers had to seek other employment in the off-season. Only few succeeded in finding other wage employment, and possibilities for subsistence production were extremely limited in Cuba, because of monopolisation of the land by sugar companies. However, the scarcity of alternative sources of income generation, leading to a high availability of seasonal cane cutters, but also to high seasonal unemployment, proved beneficial to their employers. It facilitated harvesting the cane at the best moment in a short time. Only in March, the peak month of the harvest, labor shortages existed in some regions but these could be filled up by migrant domestic workers. Sufficient labor supply during the harvest could only be realised because of high unemployment in the off-season, given the techniques in use, the predominance of the sugar sector on the labor market, and the lack of complementary employment opportunities.

After 1959, when the former government was overthrown by Fidel Castro's revolutionary movement, the situation on the labor market changed rapidly (Clemens, 1985). The implementation of new policies was associated with a rise in employment. In the first years after 1959, growth in non-sugar agriculture, mainly food production, in the construction sector, and especially in government services, particularly the army, created many new jobs. The exodus of workers

from agriculture was accompanied by a demand for them. This increase was caused by the land reform which included the nationalisation of foreign-owned plantations and increased the access to land for part of the agricultural labor force, and by the diversification policy, the latter receiving strong emphasis in the years from 1959 to 1963. The land reform resulted in a more permanent labor demand in the public sector, even if new employment was only in part productive, and in an increase in the number of small farmers, turning some semiproletarian workers into small farmers (Pollitt, 1973:255). The result of these developments was a growing labor shortage in agriculture, especially during peak activities like cane cutting, which was even aggravated by imbalances in the distribution of labor power within the sector.

By 1964 a major break in the Cuban development strategy occurred as the industrialisation policy and diversification policy failed. These policies led to a serious shortage in the balance of payments, which came to be a principal bottleneck for further development. Cuba found out that, being a small country, a growth strategy has to be based on a functional insertion in an international division of labor. So an export-led growth strategy was implemented based on expansion of the sugar sector. Important to this strategy were the trade agreements with the Soviet Union and other socialist countries. The socialist countries provided a stable and growing market for the main part of the Cuban sugar production, with guaranteed prices, which thereby changed the character of sugar dependency (Pollitt, 1986).

In the sugar sector solving the labor shortage was essential to increased production in accordance with the development strategy of the later 1960s. The government tried to do this in several ways. Apart from an anti-migration policy and mobilising urban labor power to perform agricultural work, these included technological change in sugar cane growing. The pursued technological change would reduce peak labor demand. One way to reach this was a lengthening of the harvest period. A somewhat longer harvest than in the 1950s was easily attainable without any change of cultivation techniques. A further lengthening could be realised by the development of early ripening cane varieties. Government policy in the 1960s was quite successful in this respect. However, at the end of the 1960s the harvest was forced to be even longer because of the labor problems. Most important to the reduction

of peak labor demand was the mechanisation of cane harvesting; it will be clear that the state and the state enterprises had a strong interest in mechanisation. Labour saving innovations in cane harvesting were essential for a success of the export-led growth strategy. Organised workers did not oppose to these labor saving innovations, as they were pursued in a context of labor shortages instead of unemployment. In addition, mechanisation was seen as a way to get rid of the arduous tasks of cane cutting and cane loading.

Mechanical cane loaders were successfully introduced in the 1960s. This was a result of a harmony of interest among the different actors involved, of which the state was a strong actor with enough power and organisational capacity to realise the innovation (Edquist, 1985:32-52). Being a successful 'social carrier of technique' meant having information about the existence of a technique, having access to the technique, and having knowledge how to use the technique. It had been difficult to introduce combine harvesters in the 1960s because the technology was not yet well developed and because Cuba did not have access to U.S. technology and did not make use of Australian technology before 1970. The development of Cuban designed machines took some time. However, in the early 1970s the limitations were overcome. This was mainly the result of a technological breakthrough, but also of the decision made at the end of 1970 to import Massey Ferguson combines from Australia, and the decision to burn the cane before harvesting.

After some years increasing mechanisation was facilitated by the introduction of KTP-1 combine harvesters, a product of cooperation between Cuban and Soviet engineers, and produced in Cuba. By 1987 nearly all cane was mechanically loaded and more than 65 percent was cut by combines. In addition, productivity of manual cane cutters increased in the 1970s, which can be attributed in part to increasing use of so-called dry cleaning centers before delivering the cane to the mill. When used for manually cut cane these substitute for dethrashing and cutting the cane into stalks.

The resulting mechanisation of cane cutting and increasing productivity by the remaining manual cane cutters have resulted in a large increase in average labor productivity. Because of the former predominance of cane cutting in total labor demand in agriculture, this labor productivity has had a profound socioeconomic significance.

First, mechanisation of harvesting has levelled off labor demand in sugar cane cultivation, making permanent employment economically feasible. Secondly, the accumulation model has changed, replacing the old model of extracting surplus value from cheap seasonal labor with a model based on labor productivity increases.

After years of heavy emphasis on agricultural investments in the sugar sector, in the late 1970s and in the 1980s renewed emphasis was given to industrial investments. Again the sugar sector was important in this new stage. Investment resources were directed to both the sugar industry itself and to the sugar sector-related industries. Since 1980 nine new mills were built in Cuba and some 40 existing mills were enlarged or modernised. While Roca (1976) concluded from his analysis of the 1970 sugar harvest that the failure to meet the ten million ton goal could be mainly attributed to problems in the industrial processing of the cane, Feuer (1987:75) argues that today the production of sugar cane is becoming a limiting factor in the further growth of sugar production.

Apart from sugar milling, investments were made in industries related to the sugar sector. As mentioned, combine harvesters are produced in Cuba itself, and so are most of the other machines used in cane agriculture. More than half of the equipment of the new mills was built in Cuba. The machine industry related to the sugar sector experienced high growth rates in the 1980s, doubling its production between 1981 and 1985. Another development took place in the area of sugar by-products. Bagasse is now used to produce paper and board products and molasses are used for animal feed, in part through the production of torula yeast, which is mixed with other molasses yielding a high protein animal feed. In addition, bagasse was substituted for oil as a source of energy in the sugar industry which by 1986 became totally self-sufficient with respect to energy (Noa, 1983; Feuer, 1987: 72, 78). On the other hand sugar is still exported as raw sugar to be refined in consumer countries.

Mechanisation of cane harvesting has eliminated Cuban dependency on the availability of a large reserve of seasonal labor power. But the machinery manufactured in the country contain a considerable import component, thus increasing dependency on the world market. The need to earn hard currency and the substantial investments made in sugar mills

since 1980 make it difficult to reduce sugar production now that world market prices have gone down, as this would imply large capital losses. In fact the Third Five Year Plan (1986-1990) aims in this quinquennium at an expansion of raw sugar production by 15 percent, and of refined sugar production by 23 percent.

Dependency on raw sugar prices on the world market, however, has been reduced by increasing other uses of sugar cane, and more importantly, by Cuban trade agreements with the Soviet Union, China, and Eastern European countries. The share of free market sales has been decreasing from 38 percent in 1971-75 to less than 25 percent in 1981-84 (Feuer 1987:77). The Soviet Union, which imports more than 50 percent of total Cuban raw sugar exports, is paying substantially more than world market prices, and since the late 1970s also more than U.S. preferential prices (Turits, 1987: 167). In fact export prices were linked to prices of key imports, including oil, which resulted rather beneficial for Cuba after 1974. Recently, China is becoming increasingly important for Cuban sugar sales, buying some 11 percent of total export volume since 1985.

Notwithstanding increasing domestic capital goods production and favorable trade agreements with socialist countries, Cuba still depends on hard currency imports for several strategical goods. Thus reduced free market sales of sugar, though saving the sugar sector from a crisis such as those experienced by other countries, does affect Cuban import capacity of industrial goods, particularly of those not produced by socialist countries. Reduced hard currency import capacity was compensated by increasing oil re-exports in the mid-1980s. Oil re-exports are made possible by an agreement with the Soviet Union that any petroleum shipment specified in the five-year contract that Cuba does not consume because of energy conservation, may be re-exported by the country (Zimbalist, 1988:8). In 1983 and 1984 oil re-exports represented 40 percent of hard currency income, compared to 20 percent earned by free market sugar exports (Turits 1987: 175). In fact commercial relations with the Soviet Union, together with internal energy savings policy, shifted dependency on world market prices of sugar to dependency on oil prices. Import capacity of industrial goods to be paid in hard currency, even though ultimately based on sugar production, depends nowadays more on fluctuations of oil prices than on

those of sugar. Since 1986 oil prices have gone down too, making this substitution less beneficial than in the early 1980s.

#### 4. Comparison of the Dominican and Cuban sugar cane sector

##### Role of the agro-export sector in the small peripheral economy

The Dominican Republic and Cuba have in common that they are small, peripheral countries. Because of the limited size of their domestic markets most capital goods cannot be produced on an efficient scale, so these must be imported. Foreign exchange has to be generated by the export of primary products. Thus, in an economic sense, the primary export sector replaces a domestic capital goods sector (Fitzgerald, 1985). Economic growth thus depends on a surplus in foreign exchange, and for the peripheral state, both capitalist and socialist, that means control of the foreign exchange surplus. In both the Dominican Republic and Cuba, the production of sugar, the main export product, is largely controlled by the state by means of state enterprises.

##### Choice of techniques in Dominican and Cuban cane agriculture

When considering the choice of techniques in the Dominican and Cuban sugar cane sector, and the resulting accumulation model great differences can be noticed. Cuban production and harvesting are highly mechanised, whereas in the Dominican Republic mechanisation is limited to soil preparation, planting, and cultivation; harvesting is still done manually.

In Cuba, according to the ideology of socialist states, priority in the use of modern technology was given to the state sector which was considered to represent superior production relations. In particular the state sugar estates were expected to generate production surpluses necessary for future development. Increases in sugar cane yields were furthered as the extension of sugar production encountered its limits and food production simultaneously had to be increased. The main reason for the mechanisation of cane harvesting in Cuba was that the state and its enterprises, the entities that can be considered as social carriers of techniques, had a strong interest in introducing labor saving

innovations because of the labor shortage that developed in the economy.

In the Dominican Republic the state sugar enterprises had ample access to land. The low cost of land held in reserve - and not, as in Cuba, incorporated in food production - implied that there was little emphasis on yield increases. In general, there is a tendency in agriculture first to introduce mechanical equipment for power-intensive operations such as soil preparation, whereas the mechanisation of control-intensive operations such as harvesting is postponed as long as cheap labor is or can be made available (Binswanger, 1984:17). The result is a pattern of technical change with a bias towards partial mechanisation of power intensive operations only, with an increasing demand for seasonal labor (Graziano da Silva, 1981:108; Roitman, 1982:22).

In the Dominican Republic cane cutting and loading were not mechanised and even a simple modification of the traditional harvest method proved unfeasible. Any innovation that could increase labor productivity was held off because the state sugar enterprises expected that such innovations would increase the pressure to substitute Dominican workers for Haitian cane cutters, and modification of the traditional harvest method moreover could give way to the organisation of labor. Both changes it was feared would eventually result in higher labor costs.

#### Labor market strategy

These divergent interests of the Cuban and the Dominican state and state enterprises in labor-saving innovations can thus be attributed to different situations in the labor market. Tightening of the labor market played a central role in the Cuban decision to mechanise the cane harvest. After the revolution, the strategy aimed at changing the relations of production to favor peasants and workers by providing more access to land and, in particular, by creating more permanent employment on state enterprises. Labor repression was alleviated, resulting in a decline of labor discipline and working hours. Income increases were provided through the introduction of collective goods and services, which in turn implied a new source of employment. An

important result of these various policy measures was a decline in labor supply in the agro-export sector. However, the need for a surplus in foreign exchange remained, or even increased, and thus the demand for labor did not decline. The consequence was a tightening of the labor market.

In the Dominican Republic the labor market strategy for the agro-export sector was to keep an ample labor supply. This strategy, characteristic of capitalist peripheral economies in general, necessitates the supply of semiproletarian labor to meet the seasonal demand in most export crops. Such an abundant labor supply is best guaranteed if state policy limits the access of peasants to land, credit, and other means of production. Most large landowners use the land extensively, and strongly resist reform policies which would affect labor supply. In the Dominican Republic land reform has been rather limited, which has resulted in an increase in the semiproletarian labor supply. This labor supply is augmented by contracting foreign labor. In the case of Cuba and the Dominican Republic, it can be seen that different labor market strategies result from differences in the nature of the state.

#### Type of state

In the Dominican Republic, as in most small capitalist peripheral economies, the state is dominated by a dependent bourgeoisie, mainly consisting of producers and traders of agro-export of import-substitution goods. Effective demand is located in foreign markets or, as far as the import-substitution industry is concerned, in the internal market of high income earners. This import-substitution industry depends upon foreign technology and ultimately upon export performance for the import of the means of production and raw materials, as well as for the size of its market. There is no deepening of the domestic market for wage goods as long as the dominating sectors have a one-sided interest in keeping wages low. The agro-export producers bring in the foreign exchange surplus; they control the access to land and means of production, while labor is kept in a subordinated position. The interest of the dominating classes in

keeping wages low means that they dissociate wage levels from labor productivity and that there is no interest in a long term development strategy aimed at structural change (De Janvry, 1984:2).

The Cuban state is dominated by the party, as a vanguard of workers and peasants, that has claimed to change the subordinated position of these classes and to provide them with income security and basic needs. Basic needs provision was extended primarily through collective services. The party and the government bureaucracy could not base a development strategy on a continuation of a semiproletarian form of cheap seasonal labor and thus had to look for structural change. The need to look for structural change was compounded by the ideological influence in favor of modern technology. However, it was the tightening of the labor market that forced the mechanisation of the cane harvest and that resulted in the sugar sector in an accumulated model based on labor productivity increases.

#### Accumulation

In the past accumulation in the Dominican Republic was based on an extension of land and on bringing in more unskilled labor. An important source of accumulation was through extension of the cultivation of cane onto formerly unproductive land. Sugar estates acquired land on concessional terms from the state, while peasants who occupied these lands were driven to other, often marginal areas. Cheap labor was and continues to be another source of accumulation, especially seasonal migrants from Haiti, the reproduction cost of whom continue to be supported by peasant households in the neighbouring country. These sources of accumulation were supplemented by labor productivity increases resulting from partial mechanisation and by temporal rent income in years when export prices have been high.

In Cuba after the revolution accumulation in the state sector was supported by appropriation of land from owners identified with the former regime, especially from foreign companies. However, the possibility of extracting surplus value from seasonal labor was restricted as the abundant labor supply came to an end. Cuba then had to look for a new accumulation model. Voluntary labor became a new

source of cheap labor, but only temporarily. More important were the increases in labor productivity through technological progress geared to higher yields and more fully developed mechanisation as a response to the tightening of the labor market. Capital accumulation based on increased labor productivity, through a process of technical change, in the 1970s led to self-sustaining growth in the sugar sector. Very important was the shift away from temporal rent income received before 1963 in years with high export prices to stable terms of trade with the socialist bloc.

#### Labor relations

Increases in labor productivity are a condition for improving the standard of living of the workers. When technical change is largely omitted and productivity fails to increase, as was the case in the Dominican sugar sector, this impedes the pretended development of improved job opportunities for Dominican labour. Cane harvesting then continues to depend on a huge army of cheap seasonal labor. The availability of this labor requires the denial of access to land and means of production to peasants and landless workers and supports the use of a foreign migrating labor force that is discriminated and repressed. In Cuba, the former model of subordinated seasonal labor has disappeared and fewer, but more permanent and better qualified jobs have been created.

#### Sugar crisis

The Dominican Republic sees its access to the preferential US sugar market crumble away, the prospect is one of complete dependency on the free world market which makes survival of the sugar-export sector doubtful. Hence marginal sugar enterprises are closed and land is allocated progressively to non-traditional export crops. The decision to close these factories and to write off all at once the capital invested was made easier by the enclave character which the sugar sector had kept in the Dominican Republic. As capital for alternative activities comes chiefly from foreign and domestic private investors, the state will, as indicated before, have little control over the

surplus generated in the new activities. The decision to close down part of the sugar factories was prompted by the continuing labor problems. The Dominican Republic has not been able to resolve the other crisis: severe labor scarcity in the cane harvest as a consequence of the staying away of Haitian seasonal migrant labor. The sugar sector has not prepared for large-scale mechanisation and at the depressed price level for sugar the capital for such investments is not available. Despite rethoric on 'dominicanization' of the sugar harvest the way out proposed by the sugar sector, and taken over by the government, is to return to the much criticised annual contract between CEA and the Haitian Ministry of Social Affairs that arranges the hiring of large numbers of Haitian cane cutters. Cheap labor also is the base of the alternative export activities.

Cuba locates the main part of its sugar exports in preferential markets of the East-bloc, yet the functioning of its economy is rather sensitive with respect to availability of hard currency. The actual three-to-one proportion of sales in the preferential and the free market respectively allows the country to continue sales at a loss in this free market. The integration of the sugar sector in the Cuban economy was mainly brought about before the actual crisis broke out. The use of by-products for energy and animal feed, the domestic production of equipment and machinery and several other linkages give solidity to the sugar branch. The mechanisation of the cane harvest that basically resolved the labor problem was achieved by developing production of machinery within the economy. It is along these lines that the industry is thought to survive; the planning is for a higher output of refined sugar and the search is for new sugar-cane-based products. Yet the trend for lower sugar consumption sooner or later will also effect the preferential markets where Cuba actually sells the bulk of its sugar.

## 5. Conclusions

In both the Dominican Republic and Cuba the state and state enterprises are the most important 'social carriers of technique' in sugar cane production. Their distinct interests in the two countries in labor-saving innovations can be attributed to different situations on the

labor market. In Cuba this has resulted in a spurt of mechanisation to replace seasonal workers in cane harvesting, and in a process of self-sustaining growth in the sugar sector. In the Dominican Republic cane production is dependent on cheap seasonal labor, which was realised by contracting Haitian cane cutters. The dependence on this foreign labor force was highlighted by the fall of the Haitian dictator in early 1986, which led to problems in contracting labor. The postponement of the introduction of labor saving innovations and the systematic transfer of a surplus from the sugar sector has prevented the achievement of a self-sustaining growth process in the Dominican sugar industry. The industry not only failed to find other sources of cheap labor, but actually is closing down part of its sugar factories. The brighter prospects of the Cuban sugar sector are not only due to the access to preferential export markets, but also to the manifold linkages within the economy that diversify and reinforce accumulation.

The different choice of techniques in cane harvesting in Cuba and in the Dominican Republic resulted from the distinct socioeconomic and political structure in both countries, as their respective governmental policies, determined by the class nature of the state, caused a labor shortage in Cuba, whereas ample labor supply was maintained in the Dominican Republic. The behavior of the actors capable of innovating showed to be quite different in the two countries due to structural factors. These factors result in the introduction of labor-saving techniques in the socialist peripheral economy, whereas the labor-intensive way of production is maintained in the capitalist peripheral economy.

## REFERENCES

- Binswanger, H.P.  
1984 Agricultural Mechanization: A Comparative Historical Perspective. Washington D.C.: World Bank Staff Working Papers Number 673.
- Boin, J. and J. Serulle Ramia  
1981 El Proceso de Desarrollo del Capitalismo en la Republica Dominicana (1844-1930). Tomo Segundo, Santo Domingo: Ediciones Gramil.
- Buitelaar, R. y J.P. de Groot  
1985 Productores Capitalistas y Campesinos. Amsterdam: Universidad Libre (mimeo).
- Carreño, N.  
1984 "El sistema de explotación agrícola: la organización técnico-económica de la producción cañera en la República Dominicana 1987-1925". Revista Estudios Dominicana (Enero-Abril): 109-135.
- Cassá, R.  
1982 Capitalismo y Dictadura. Santo Domingo: Editora de la UASD.
- Clemens, H.  
1985 Mechanisatie van de suikeroogst in Cuba, een antwoord op het arbeidstekort in de landbouw na de revolutie. Researchmemorandum 1985-25, Faculteit der Economische Wetenschappen, Vrije Universiteit Amsterdam.
- Edquist, C.  
1985 Capitalism, Socialism and Technology: A Comparative Study of Cuba and Jamaica. London: Zed Books.
- Feuer, Carl Henry  
1987 "The Performance of the Cuban Sugar Industry, 1981-85". World Development 15 (January): 67-81.
- Fitzgerald, E.V.K.  
1985 "The problem of Balance in the Peripheral Socialist Economy: A Conceptual Note". World Development 13 (January): 5-14.
- GEPLACEA  
1983 Foro sobre Desarrollo y Perspectiva de la Agroindustria Azucarera: Mexico.
- Graziano da Silva, J.F.  
1981 Progresso técnico e relacoes de trabalho na agricultura. Sao Paulo: Hucitec.
- Groot, J.P. de  
1986 Landhervorming in de suikersector in de Dominicaanse Republiek. Researchmemorandum 1986-52, Faculteit der Economische Wetenschappen, Vrije Universiteit Amsterdam.

- Harris, S.  
1987 "Current issues in the world sugar economy". Food Policy 12 (May): 127-145.
- Janvry, A. de  
1981 The Agrarian Question and Reformism in Latin America. Baltimore and London: The John Hopkins University Press.
- Janvry, A. de  
1984 The Search for Styles of Development, Lessons from Latin America. Working Paper no. 357, Department of Agriculture and Resource Economics, University of California, Berkeley.
- Latorre, E. et al  
1984 "Propuesta para la dominicanización de la zafra azucarera". Ciencia y Sociedad 1 (Enero-Abril): 138-154.
- Moya Pons, Frank et al.  
1986 El Batey, Estudio socioeconómico de los bateyes del Consejo Estatal del Azúcar. Santo Domingo: Fondo para el Avance de las Ciencias Sociales, Inc.
- Noa, Herly  
1983 "The Development of By-products from Sugar Cane in Cuba". Sugar y Azúcar (February): 126-129.
- Plant, Roger  
1987 Sugar and modern slavery, a tale of two countries. London: Zed Books.
- Pollitt, B.H.  
1973 "Employment Plans, Performance and Future Prospects in Cuba". in R. Jolly et al (Editors) Third World Employment: 248-265. London: Penguin Books.
- 1986 "Sugar, 'Dependency' and the Cuban Revolution". Development and Change 17 (April): 195-230.
- Roca, Sergio  
1976 Cuban Economic Policy and Ideology: The Ten Million Ton Sugar Harvest. Beverly Hills California: Sage Publications.
- Roitman, B.  
1982 "La ocupación de mano de obra en el agro latinoamericano: aportes para una discusión". Economía de América Latina 9 (Segundo Semestre): 12-27.
- Turits, Richard  
1987 "Trade, Debt, and the Cuban Economy". World Development 15 (January): 163-180.
- Zimbalist, Andrew  
1988 "Cuban Political Economy and Cubanology: An Overview", in: Andrew Zimbalist, editor, Cuban Political Economy, Controversies in Cubanology. Boulder: Westview Press.