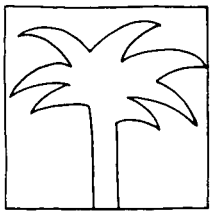

The Fiji Sugar Industry : a brief history and overview of its structure and operations

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Role of sugar in the Fiji economy

Sugar became the principal export of Fiji from the early 1880s. Over the years, the sugar industry has constituted the prime force in the development of the economy. Despite efforts to diversify the economy, the predominant role of sugar continues today. Sugar is Fiji's largest single export and over the years 1983-87 accounted for between 58 per cent and 65 per cent of Fiji's domestic export earnings. By comparison, the second largest export product, gold, accounted for between 10 per cent and 16 per cent of export earnings.

Sugar plays a major role in terms of employment. Over 20 per cent of the economically active population of Fiji is directly employed by the sugar industry. In addition the industry has strong multiplier effects. On the basis of 1977 input/output tables the sugar multiplier is estimated to be 2.04 at factor cost and 2.23 at market prices. This compares favourably with 1.41 and 1.58 respectively for the tourist industry[1]. The industry's importance is also highlighted by the fact that its import leakages have been extremely low.

Throughout its history, the industry faced numerous difficulties and challenges that effectively tested its ability to survive. These were in the form of labour shortages in its early history, production fluctuations and low

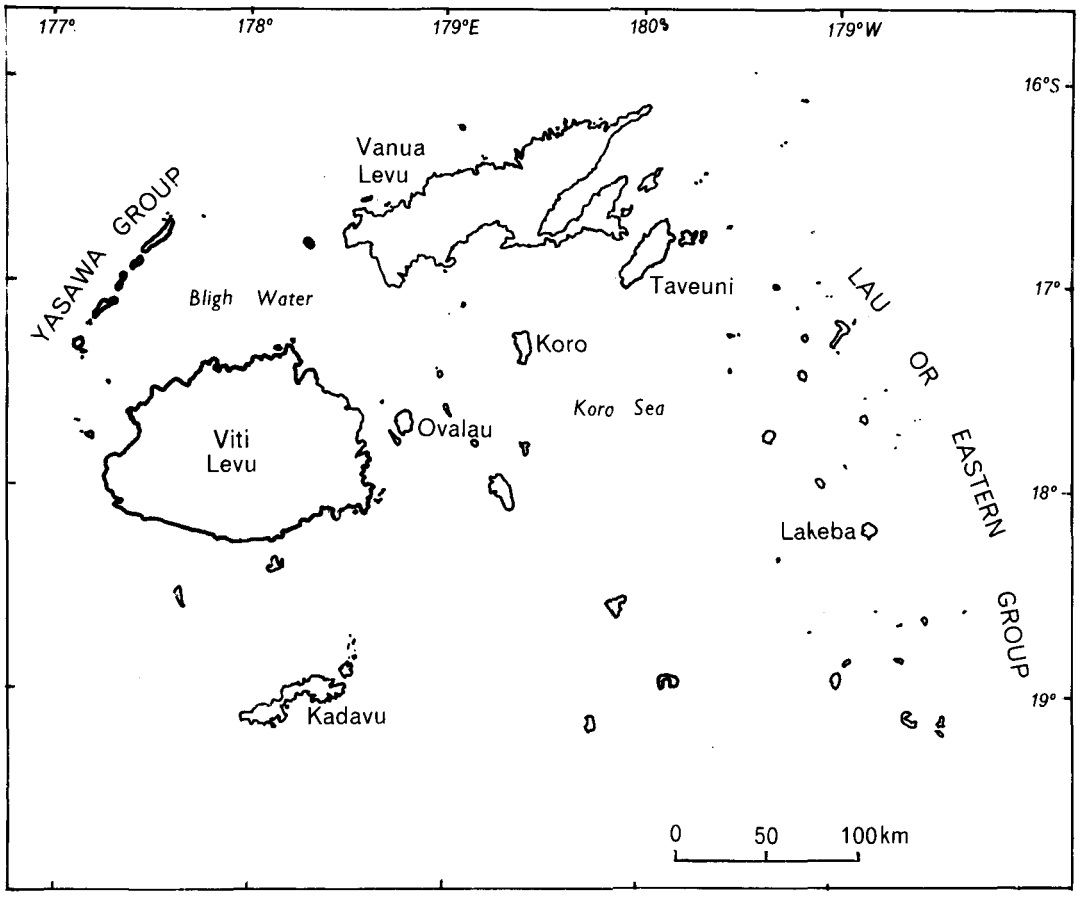
Table 1 **Export contribution - sugar. molasses and gold**

Year	Receipts (F$M) Sugar and Molasses	Gold	Total Domestic Exports	Contribution (%) Sugar and Molasses	Gold	Others
1983	115	17	178	65	10	26
1984	117	20	198	59	10	31
1985	118	22	191	62	11	26
1986	142	39	242	58	16	26
1987	197	51	334	59	15	26
5 year	689	149	1143	60	13	27

Source: Bureau of Statistics, *Current Economics Statistics*, Suva.

1 Calculations by the Economic Analysis Unit, Ministry of Finance.

Fiji



prices at various times, and, most recently in 1987, political difficulties in the country. Each threatening situation emphasised the resilience and survival characteristics of the industry.

History of sugar in Fiji

Sugar cane first became an important crop in Fiji during the 1870s, and, over the years, thirty-four small sugar mills were established throughout the country.

With one exception (Nadroga), all the early developments in sugar took place in the wet areas of Fiji near Suva as it was believed that wet areas would give higher yields. The cane yield was there but the sugar content in the cane was very poor. As a result all the mills in the wet zone ceased operations.

Wakaya Sugar was first produced in Fiji in 1862 on the island of Wakaya. The venture failed because Wakaya is a small island and not suited to growing sugar cane.

Suva A small mill was built in the centre of Suva in 1872 but soon closed down. Another mill subsequently set up in Suva also closed down after a short period of operation. Sugar was first exported from Suva on 7 November 1873.

Nausori At least ten mills were established in the Rewa Valley. The Colonial Sugar Refining Company (CSR), that was already operating raw sugar mills successfully in Queensland and New South Wales, became interested in Fiji in 1880, and, at the invitation of the Fiji government, erected Fiji's first large-scale mill at Nausori in 1882.

The mill commenced crushing on 17 July 1882. In 1884, the Nausori mill was the first place in Fiji to be lit by electricity. This mill became uneconomic to operate mainly because

of the very low sugar content in the cane, and was closed in 1959.

Rarawai CSR put up its second mill, in Rarawai, in 1886. Railway lines were constructed in 1907 to Tavua and to Lautoka in 1910.

Vanua Levu Six mills were erected between Labasa and Savu Savu. The most important was the Labasa mill, that began crushing in 1894.

Lautoka This mill was built by CSR and started crushing in 1903. At the present time, it is the largest mill in Fiji. The railway was extended to Nadi in 1905 and to Sigatoka by 1912. The Sigatoka bridge over which the tramline passes was built in 1914.

Rakiraki The Penang mill was built in 1880/81 by the Chalmers brothers and was later acquired by the Melbourne Trust Company. CSR bought the mill in 1926.

After the closure of Nausori mill in 1959, CSR was left with only four sugar mills at Lautoka, Rarawai, Labasa and Penang, and these continue in operation today.

In 1962, CSR established its subsidiary, South Pacific Sugar Mills Limited (SPSM) to own and operate its milling business in Fiji. In 1964, the SPSM became a public company and although shares were offered for sale to the public, only 2 per cent of issued capital was bought by Fiji residents. The Fiji Government now owns 68 per cent of the shares.

Smallholder system of farming

In the mid 1870s the industry was faced with an acute shortage of plantation labour as a result of the decline in the supply of manpower from other Pacific islands. Sir Arthur Gordon, the Governor of the colony at the time, was determined not to interfere with the lifestyle of indigenous Fijians or their land, but he had to find a solution to ensure the viability of the industry. The Governor decided to import Indian labour under an indentured labour system. The arrangement was that they would come under contract for an initial period of 5 years, at the end of which they would be entitled to full passage back to India or given the opportunity to stay in Fiji.

The first Indians arrived in 1879. The importation of Indian labour stopped in 1916 and the indenture system was discontinued in 1920 because of the continuing opposition to it from the Indian authorities and from pressure groups in Fiji. Following the termination of the indenture system, the industry was again faced with a serious shortage of labour.

Under this extreme threat, CSR introduced a system of contract growing of cane by small tenant farmers. Under this scheme, tenants were given small parcels of land, averaging 11 acres, for the production of cane and other subsistence crops. The smallholder system worked extremely well and remains the basis on which the agricultural sector of the industry is organized. This system relies on the utilization of growers' own and family labour. This enables cash outflows to be kept to a minimum and growers have the opportunity to improve their disposable income by planting other cash or subsistence crops. While there is a move towards greater employment of hired labour, the small farm system continues to provide a considerable buffer during periods of low production and low sugar prices. The following statement from the Fiji Employment and Development Mission Report (1984) highlights the importance of the small farm system:

> Not only does it increase the general impact of the industry, by generating stronger multiplier effects, it creates a structure which is more flexible than most large scale farming systems because of its ability to substitute family labour for hired and to switch gradually into other crops, or even into subsistence production, if the price falls to unmanageable levels[2].

Change of ownership

The decision of CSR to withdraw from Fiji, in 1973, after a period of involvement in the industry for almost 100 years, was one of the most important developments in the history of the industry. The decision followed disagreement on the terms of a new sugar cane contract.

The sugar cane contract in force from 1960 was to expire in 1970. When negotiations on the terms of a new contract failed, the matter

2 *Fiji Employment and Development Mission Report*, Final Report to the Government of Fiji, Parliamentary Paper No.66, 1984.

was referred to arbitration. Lord Denning was appointed arbitrator. The major matter in dispute was the formula for division of the proceeds between the miller and the growers. The growers had, over the years, disputed the share of the proceeds accruing to them. Lord Denning, after a lengthy arbitration, decided that the growers would receive 65 per cent of the sugar and molasses proceeds with a minimum price of F$7.75 per tonne, and the miller would receive 35 per cent, or less. This was a major victory for the growers. They saw the award as redressing a longstanding grievance. On the other hand, CSR was dissatisfied with the award and went to great lengths to inform the public that Lord Denning had based his decision on incorrect information. They made it clear that they could not see profitable operations on the basis of the sharing formula awarded by Lord Denning. It was clear that CSR would not continue in Fiji.

The government of newly independent Fiji (independent since 1970) was aware of the critical implications of CSR's withdrawal and urged CSR to give the contract a trial period and then seek a review, if necessary. However, CSR announced that it would continue operations only until 31 March 1973, for three years of the contract term.

The government, after considering how best to handle discontinuation of milling operations by CSR, decided that Fiji should purchase the CSR shares in SPSM. Following negotiations with CSR, a Share Purchase Agreement and a Service Agreement were finalized. The Share Purchase Agreement contained the terms of sale and payment and the Service Agreement was to ensure that there would be an orderly handover of operations. The Service Agreement also provided for CSR to continue to market Fiji sugar and provide engineering and technical services for a negotiated time period. The first day of April 1973 marked the end of CSR's operations in Fiji and the takeover of milling operations by the Fiji Sugar Corporation Limited (FSC), a public company established by the government to take charge of sugar milling. The government is the majority shareholder in the Corporation, owning 68 per cent of the shares. The remaining shares are held by organizations and individuals in Fiji.

The sugar industry structure

There were no changes to the sugar industry structure when the FSC took over milling operations from CSR and for many years thereafter. The major existing sugar industry institutions were the Independent Chairman's Office, a Sugar Board and a Sugar Advisory Council. Deliberations on industry matters and decisions rested with these three institutions. However, the growers were persistent in their demands that the industry structure should be changed to give them a greater role in industry decisions. These demands finally led to a major restructuring of the sugar industry. The new structure was given legal status by an Act of Parliament in 1984.

The new institutions established under the changed structure were: the Sugar Commission of Fiji, the Sugar Cane Growers Council, the Mill Area Committees and the Sugar Industry Tribunal.

The Sugar Commission of Fiji is the body responsible for the overall coordination of the activities in the industry. Growers, the FSC, the government and sugar industry unions are represented in this body that has a total membership of fifteen. The expenses of this institution are funded from sugar industry proceeds.

The Sugar Cane Growers Council was established to represent the cane growers and is funded by levies imposed on the growers. It has a total membership of 111.

The Mill Area Committees have been set up to facilitate resolution of operational problems at the mill level on such matters as harvesting, transport and allocation of cane supply quotas. There is a committee for each mill area and it has representatives of cane growers, the FSC, the government, and industry unions. The expenses of the Mill Area Committees are funded from sugar industry proceeds.

The Sugar Industry Tribunal has wide ranging powers including the determination of disputes in the industry and the preparation of a Master Award to replace the existing cane contract. Its expenses are funded by the government.

The structure of the FSC was not altered in any way in the restructuring exercise. In reality, however, the changes were designed to curb the FSC's influence and role in the management of industry matters.

Sugar cane contract

The relationship between the FSC, the millers, and the cane growers is governed by a sugar cane contract - referred to as a Contract of General Application. While each farmer has a

separate contract with the FSC, the terms of the contracts are identical. The contract includes provisions covering the sale and purchase of cane, harvesting and delivery, burnt cane, crushing operations, advances, storage, marketing and sale of sugar and division of proceeds. The contract sets out the basis for determining the harvest quota for each farm. The harvest quota is the amount of cane that will be bought each year from the farm by the FSC. This regulation of the quantity of cane to be purchased is based on the yield of sugar from cane, milling capacity and market commitments. In recent years, harvest quotas have not been imposed as cane and sugar production have not exceeded the limits of milling capacity and available market outlets. The contract also contains penal provisions for burnt cane supplied to the mills to discourage burning of cane. The sections on delivery and transport, inter alia, spell out the FSC's responsibility for the provision of rail transport and all related facilities. The clause on advances regulates the Corporation's obligations to make interest free advances to growers for cost of seed cane required for planting, purchase of fertilizer and harvesting and delivery costs.

Table 2 **Distribution of proceeds of sugar sales (%)**

Total sugar produced	Growers' share	FSC's share
Up to 325,000 tonnes	70.0	30.0
For every tonne over 325,000 up to 350,000	72.5	27.5
For every tonne over 350,000	75.0	25.0

Source: The Fiji Sugar Corporation Limited

The contract sets out the formula for division of the total receipts from the sale of sugar between the FSC and the growers (Table 2). The price per tonne of cane payable to each grower is derived by dividing the total growers' share of proceeds by the total tonnage of cane supplied by the grower in the season. Payment to individual growers is based on tonnes of cane delivered to the mill. This is different from the practice in many other countries, where, in order to encourage the growing and delivery of high quality cane, payments to growers are based on sugar content[3]. In the last three seasons (1986-88) the cane price has ranged from $36 per tonne to $52 per tonne. The Corporation receives and manages the proceeds of sugar and molasses and makes payments to growers at the times specified in the contract.

As the price of cane is not known until all the season's sugar has been sold and proceeds received, the FSC is required to announce a forecast price per tonne of cane. The forecast price is based on a number of variables including estimates of cane and sugar production, prices at which sugar will be sold, freight and exchange rates. Payments to growers are paid in four instalments as proceeds are received.

The terms of the cane contract, in particular the formula for division of proceeds, have always been a major bone of contention between millers and growers. Under the provisions of the Sugar Industry Act (1984) the cane contract will be replaced by a Master Award, a standard document that will govern the mutual rights and obligations of cane growers and the FSC. This document, unlike the cane contract, will have a continuing life but with provisions for review of the terms and conditions if so required. The Master Award is currently being formulated by the Sugar Industry Tribunal and will come into force in the 1990 season. Section 64(3) of the Sugar Industry Act states:

> When made, the Master Award shall be final and conclusive, shall not be challenged, appealed against, reviewed, quashed or called into question in any court, and shall not be subject to prohibition, mandamus or injunction in any Court.

Farming

There are over 22,000 growers supplying cane to the four sugar mills. The average holding is between 4 and 5 hectares. Currently, the total area contracted for cane production is 94,000 hectares, of which about 70,000 hectares are harvested in any one season. The industry has been expanding.

3 The penalty for burnt cane provides some quality incentive.

Table 3 **Area under cane cultivation (hectares)**

1964	56,000
1973	65,000
1980	86,000
1987	94,000

Source: The Fiji Sugar Corporation Ltd. records.

Indians have traditionally dominated cane production but an increasing number of Fijians have entered the industry since the FSC was established.

Harvesting is done manually and because of its probable effects on employment of a large sector of Fiji's workforce, mechanical harvesting is not likely to be considered in the near future. Cultivation work is slowly being mechanized. Animal power, used since the industry started, is still widely used.

The declining trend in production was one of the major areas of concern to the FSC when it took control of milling operations. Cane production had declined from 2.46 million tonnes in 1973 to 2.08 million tonnes in 1974 and continued at this low level in the early years of the FSC. Following the Denning award, CSR had not placed much emphasis on increasing production. The announcement of CSR's decision to withdraw from Fiji also led to feelings of anxiety and uncertainty regarding the future of the sugar industry. Rundown of farms, general neglect of cultivation practices, inadequate and untimely fertilizer application were clearly noticeable.

The Corporation took on the challenge and committed itself to reversing the trend of declining production. Attention was given, in the first instance, to issuing new contracts for available land within the existing cane producing areas. This was the most desirable immediate approach, as it involved minimum cost. It soon became apparent that it was necessary to bring in a very large area of new land under cane, if the required increase in crop was to be obtained.

Although several areas were identified, the largest area of recent development has been the 'Seaqaqa Cane Development Scheme'. Seaqaqa, although having third class soil was identified as the only remaining large area of land climatically suited for cane cultivation and within reasonable distance of a sugar mill. The objective was to settle some 800 growers, 50 per cent Fijian and 50 per cent Indian, to produce 200,000 tonnes of cane per season. The Seaqaqa settlement area comprises 16,200 hectares of land on the Seaqaqa plateau of Macuata Province, 40 km west of Labasa between the Dreketi River and the coast of Vanua Levu. A considerable amount of development work was needed to make it suitable for cane cultivation as the area was under natural vegetation and infrastructure was virtually non existent. At the time of the inception of the Seaqaqa Development Scheme, Fiji was in its fourth year as an independent nation. In view of the many competing development and other requirements, external funding assistance was vital to make the project a reality. Following an initial identification mission, the World Bank carried out a detailed appraisal towards the latter part of 1975 and agreed to finance the foreign exchange component of the project cost. Seaqaqa was the

Table 4 **Distribution of cane producers (average 1985-87)**

Tonnes	Indians	Fijians	Others	Total
Produced per farm				
Up to 20	965	1534	473	2972
20-50	1439	1110	55	2604
51-100	2855	1176	52	4083
101-150	2971	705	30	3706
151-200	2569	378	23	2970
201-250	1890	225	13	2128
Over 250	3578	346	34	3958
Total	16,267	5474	680	22,421

Source: The Fiji Sugar Corporation Ltd. records.

Table 5 **Seaqaqa cane, sugar and revenue achievements**

Year	Cane produced (tonnes)	Resultant sugar (tonnes)	Sugar revenue (F$million)
1979	241,316	26,258	7.67
1980	215,132	24,037	10.00
1981	251,109	29,198	8.98
1982	316,038	36,749	11.48
1983	197,489	24,381	8.21
1984	293,313	33,331	8.60
1985	253,759	29,854	9.39
1986	252,756	29,736	12.30
1987	224,713	31,472	16.40

Source: The Fiji Sugar Corporation Ltd. records.

most ambitious cane development scheme embarked on in the recent history of the industry. The major objective of the scheme was to produce 200,000 tonnes of cane. By 1979 the objective had been more than achieved.

An important offshoot of the Seaqaqa development was the establishment of a township and related infrastructure. Many new road linkages were established. Many people found employment during its development phase, and Seaqaqa now provides employment to a large number of people on a continuing basis. The first ever important Fijian participation in sugar cane growing has been the single most important factor in the Seaqaqa development. A 50/50 level of participation between Fijians and Indians was set out to be achieved and it was achieved.

Cane transport

Cane is hauled to the mill on rail trucks with an average capacity of 3 tonnes, or by trucks carrying an average load of 10 tonnes. The rail system and trucks each transport approximately half of the cane.

The Corporation's total investment in the rail system comprises 640 km railway track, 250 km of portable line, 70 locomotives and 10,000 cane trucks. It also owns 100 sugar bins and gins that transfer sugar and molasses from Rarawai to Lautoka. The railway system is 610 mm gauge and the main line is single track with very few passing lines. It has four sections with a permanent tramline network of 640 km. Each section serves one of the four mills. Lautoka and Rarawai are inter-connected, primarily for transportation of raw sugar and molasses from Rarawai to Lautoka bulk sheds.

The infield operations of the rail system are one of two types. Portable line is the traditional system. Light railway track is laid from the main line to the area being harvested and the trucks are moved to and from the main line by a pair of bullocks or by tractors. This method is best suited to large gangs operating in flatter terrain. In the tractor winch trailer system, trucks are transported to and from the railway siding by means of tractor and trailer. The tractor is fitted with a front mounted 'power-take-off' driven winch and has rails fitted at the rear to be lowered onto the railway line to allow the truck to be mounted and demounted. For infield loading the truck is lowered onto two or three lengths of portable track that, on steep land, is laid on a hand levelled site. This system is currently employed on all terrain categories, and is favoured by small harvesting gangs.

The truck transport method involves hand loading the lorries infield and transporting the cane directly to the mill. This system originated in areas inaccessible to the railway system but has spread to all areas.

The rail system has considerable advantages over road transport. It is more dependable during adverse weather conditions, and the FSC provides rail transportation free of charge to growers, whereas, at present, the truck users meet full transportation costs. However, in recent years, there has been considerable agitation that the road transport of cane should be subsidized. It is expected that, in the Master Award, there will be a provision for payment of a transport allowance to truck users as partial compensation towards their cost of transportation.

Milling of cane

Fiji Sugar Corporation's four mills have a total rated capacity of about 1000 tonnes cane per hour and can handle over 4.2m tonnes of cane in a season.

Table 6 **Capacity and output of sugar mills**

	Rated capacity	Tonnes cane crushed (thousands of tonnes)			
		1986	1987	1988	Av. 3 season
Lautoka	350	1576	1024	1117	1239
Rarawai	290	1155	751	744	883
Labasa	270	1017	878	1035	977
Penang	90	360	308	289	319
Total	1000	4109	2960	3185	3418

Source: The Fiji Sugar Corporation Ltd. records.

The crushing operations normally commence in May/June and continue to December processing 24 hours a day, 7 days a week. Continuous operations have been a feature of the industry for 30 years. Labasa mill was the pioneer in this, later joined by other mills.

The practice of continuous crushing operations is advantageous to both the growers and the miller. The obvious benefits are:

- higher sugar output;
- considerable fuel economy, especially with low fibred cane;
- decrease in cane delays and shutdown losses;
- better process control, higher throughout and better sugar quality;
- a longer slack season maintenance and capital works period;
- longer cane growing time;
- reduction in cyclic thermal stressing of the plant.

In Fiji comparatively low cane fibre levels, varying from 10 to 14 per cent, make it important to monitor the fuel economy of the factories. At the beginning of the season a shortage of bagasse can lead to purchased fuel usage. This is avoided by stockpiling bagasse from the latter part of the previous season for use at the start of the next. The availability of bagasse makes the Corporation self-sufficient in fuel at most times.

The overall sugar production figures vary from year to year and, in the years 1986 to 1988, has ranged from over 360,000 tonnes to over 500,000 tonnes. This is due to considerable variability in weather conditions. Fiji is prone to cyclones and in some seasons as many as three have been recorded. Drought also takes its toll. Because of these vagaries in weather conditions, the industry has had difficulty maintaining a stable level of production.

Table 7 **Sugar production and yield statistics**

Mill	Tonnes sugar produced		
	1986	1987	1988
Lautoka	196,455	138,501	129,175
Rarawai	143,639	101,332	86,861
Labasa	119,395	122,917	116,955
Penang	42,311	38,307	29,827
Total	501,800	401,057	362,818
	Tonnes cane/tonnes sugar		
	1986	1987	1988
Lautoka	8.0	7.4	8.7
Rarawai	8.0	7.4	8.6
Labasa	8.5	7.1	8.8
Penang	8.5	8.0	9.7
Total	8.2	7.4	8.8

Source: The Fiji Sugar Corporation Ltd. records.

Storage and marketing

The Fiji Sugar Corporation is responsible for storage and marketing of sugar and molasses. The marketing function is performed by the Fiji Sugar Marketing Company Limited under an agency agreement with the FSC.

Some 33,000 tonnes of raw sugar is produced for local consumption and for export to the neighbouring island territories, and, usually, 360,000 tonnes are sold under long-term arrangements or at special price arrangements. Fiji's main markets are the United Kingdom, Malaysia, the United States, China and New Zealand. The long-term arrangement with the European Community for an annual supply of 174,000 tonnes at prices designed to support European beet sugar producers, is the industry's revenue backbone. Practically all sales to the European Community are to the United Kingdom. This market has provided considerable stability, particularly in periods of low prices.

Bulk sugar handling facilities were installed in Labasa in 1978 and Lautoka in 1979. Export sugar and molasses from Rarawai and Penang mills are transported to Lautoka for shipment. In recent times, Penang mill generally produces local consumption sugar and only the surplus production is exported. In a normal year Penang would produce 30,000 tonnes direct consumption raw sugar including 2500 tonnes that is shipped in paper bags to New Zealand. Labasa produces about 3000 tonnes of direct consumption raw sugar and the rest is all exported.

The total bulk sugar storage capacity at Labasa is 30,000 tonnes and that at Lautoka 120,000 tonnes. The bulk sugar loading rates are 450 tonnes per hour at Labasa and 850 tonnes per hour at Lautoka.

Future prospects

The sugar industry has faced many difficulties and challenges but has proved to be resilient. It has continued to develop and grow and, between difficult periods, has enjoyed periods of relative prosperity. The current season holds promising prospects for the industry. It is expected that 1989 production will be 475,000 tonnes compared to 362,000 tonnes in 1988.

The objective of the industry is to achieve a production level of between 550,000 and 600,000 tonnes per season. The maximum production realized by the industry so far has been 501,800 tonnes. The industry is confident that a sugar production of 550,000 tonnes can be achieved from existing areas; there is sufficient land area. What is needed is improvements in cane and sugar yields. There are a number of growers in the industry who produce below the yield potential of their farms. A concerted effort is being made to see that yields from these farms are improved. Attention is also being focused on improvement of sugar yields by improvement of farming practices. Factory capacities can handle up to 525,000 tonnes; provision is being made in plant replacement programs to boost the crushing capacity to handle a production level of 550,000 tonnes.

Circumstances are right for the industry to move to a production of 550,000 tonnes in the next three to five years. Prospective cane prices are sufficiently remunerative to provide incentives for increased production. The recent devaluations of the Fiji dollar have assisted in boosting domestic prices. A contribution has also come from an increased level of world market prices.