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The Economic, Social and Environmental Impact on Mauritius of Abolition of Internal Quotas of Sugar in EU Market

Report for:

Ministry of Agro Industry and Food Security Mauritius

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Research and analysis to inform your business decisions

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Section 1: Introduction

The TOR of the Study refers to certain key concepts namely the *resilience* of the sugar cane industry in the teeth of multiform competition from *sugar suppliers and alternative sweeteners*; the importance of the *filière* approach; the *relocation* of operations in Mauritius; a *bold and innovative* plan in respect of small planters for the continuation of their involvement in sugar directly or through other means.

1.1 The imminent erosion of preference

Since 2009, the price received by Mauritian producers for sugar sold to EU buyers has been derived from the market price, and its movements have a direct impact on the price received by Mauritian producers. Under the current quota system, imports are guaranteed a share of the EU market and this reliance on imports — some of which pay a duty of close to €100/tonne — has been supportive of prices in most years. This support has been the basis Mauritius' preference in the EU market over the world market.

However, the removal of quotas in 2017 will allow producers of beet sugar and isoglucose to increase sales in the internal market. The challenge facing overseas suppliers, such as Mauritius, reflects the fact that EU beet growers and processors have made huge strides in improving the efficiency of their production, allowing them to raise significantly their competitiveness against imports. Indeed, the most efficient beet sugar producers Europe will soon be competitive as exporters on the world sugar market.

When quotas are lifted, the beet industry is planning to supply a greater share of internal market demand at the expense of imports. This year, the sector has emphatically demonstrated its capacity to raise production, with sugar output expected to exceed quota by 5-6 million tonnes. To gain market share after 2017, sugar prices in the EU will fall to level at which it is no longer attractive for overseas suppliers to ship sugar to the EU. The implication of this is that overseas suppliers will no longer earn a preference from sales of raw or refined sugar in the EU vis-à-vis the world market.

The consequences of greater supply in the EU market can already be seen today. Sugar prices today are trading at around €400-430/tonne, down from more than €700/tonne two years ago, reflecting over-supply that has arisen because of a series of "special measures" introduced by the European Commission between 2010/11 and 2012/13 to boost supplies when internal market supply was tight and prices were high. Once industry costs are deducted, Mauritius already earns little preference on sales of sugar to the EU over returns from the world market.

2014 represents a real wake-up call for things to come and the response to change has to start now and not in 2017 when it will be too late. On 26 September 2014, MSS estimated that the ex-Syndicate sugar price for the 2014 crop will drop to just MUR12,500 per tonne, far below the viability price of producers throughout the sector.

➢ *The threats ahead are so formidable that Mauritius should do away with the shackles of its sugar history and think in terms of competition in a globalised world.*

1.2 New rules and practices

The Mauritian sugar industry will have to stand up to such challenges. Price forecasts for 2014 and for the next years are lower than what is required to ensure that Mauritian producers receive a price that is consonant with viability. This is the *sine qua non* condition for the maintenance of a sugar industry. These producers will have to reckon with a more competitive market environment in the EU sugar market and with the strength of the Rupee, especially in relation to the Euro. A *business as usual* scenario that focuses on *acquis* and is lukewarm to change will spell disaster.

As a consequence, the industry must review and overhaul its rules and practices that date back from the zenith years of the sugar industry and which are neither applicable nor wise in times when fierce competition is the order of the day. A few decades back, the sugar industry had a key social and rural stabilisation role. This has significantly dwindled, in that the sugar industry now employs less than 2% of the labour force and small and medium planters have over the past 10 years decreased by nearly 40%.

A new sugar industry means new ways of doing things, new paradigms and the shedding off of past privileges. The Sugar Protocol was said to be of "*indefinite duration*" and this was raised to the status of a mantra and hailed by the ACP as being of a permanent nature and the accord was termed a "*sacrosanct*" agreement by the ACP. The Protocol has been terminated and the Sugar Regime, which was also considered as permanent, is being overhauled in its very foundations. The European sugar industry, traditional ally of the ACP since 1975 on account of specific circumstances, is gearing up to be world competitive and is ready and eager to displace imported sugar in the EU as from 2017 now that benefits brought related to the entry of ACP sugar have disappeared. The "*commonality of interests between beet producers and ACP exporters"* is now a thing of the past.

1.3 Environment

The role of the sugar industry in the protection and preservation of the environment has increased and can increase. The MAAS lengthily elaborated on the positive role of cane cultivation in respect of the environment and explained the risks of the disappearance of this crop. The MAAS also underscored the importance of the cane sector for the tourism industry, ensuring pristine lagoons and maintaining a soothing and appealing landscape.

Additionally, the sugar sector provides some 15% of the country's electricity production through the use of bagasse, thereby avoiding the import of some 200,000 tonnes of coal or some 80,000 tonnes of high sulphur heavy fuel oil, also containing carcinogenic poly-naphthalenes. The establishment of a mandatory framework for the blending of gasoline (or mogas as it is termed in Mauritius) would allow the country to move to an E10 mode and thus allow it to move away from zero use of renewable energy in the transport sector. Already the entry into operation of bagasse/coal plants has enabled the country to generate nearly 20% of its electricity from renewables, a status that many developed countries have not yet attained; step up private sector participation in energy generation to some 55% of the total; and diversify the energy base and move away from risky and volatile oil.

In time, a performing industrial set-up can allow the country to enhance its share of renewable energy if needed. In the transport sector, the economics of oil may one day justify a diversion of cane juice to ethanol and call for a higher use of cane biomass, in particular high biomass cane varieties, for the generation of electricity that does not involve imports of fossil fuels nor the emission of additional carbon dioxide and the obnoxious sulphur dioxide considered by the US Health Department as being a key factor in respect of asthma and broncho-restriction diseases.

Thus, cane and the preservation of land are not only for sugar production and the tourism industry but also for the energy sector, now and in the future. In this respect, the sugar sector has to be a guardian of land. In spite of its low relative importance in the GDP, it is a public good that has to be preserved for future generations, and policies should be tailored accordingly. Large-scale abandonment of cane plantations by small and medium planters mainly has brought in a serious risk factor for the sugar, tourism and energy industries.

In most countries, the price paid, or received, for a renewable source of energy is higher than that of fossil fuels. Even in Mauritius, solar and wind energy are priced higher than high-sulphur heavy fuel oil. The reverse applies to bagasse energy; it is priced lower than fossil fuel energy and, in certain cases, price mechanisms act as a deterrent to the higher use of biomass.

It is noted that the difference between the price of electricity sold by sugar companies and the cost of generation of the CEB is more or less equal to the subsidies afforded by the CEB to the export manufacturing sector. This was possible in the heydays of the Sugar Protocol. The challenges of the future call for a revision of biomass pricing policies. The cane biomass industry is very often, for so many reasons of expediency, viewed with the blinkers of a long foregone history, and there has been a great reluctance to foster this activity. This is even less understandable given the fact that all power companies using bagasse have small planters and employees as shareholders via the Sugar Investment Trust.

1.4 Efficiency is paramount

The challenges confronting the sector call for the country to have an efficiently performing and highly competitive industrial set-up that is able to stand up to competition. In particular, it must be able to compete with the EU sugar majors, who have already undertaken major upgrading and are backed up by efficient and lean research that has allowed them to make continuous productivity gains. Equally, as most of these producers operate in an internal market, with the EU market absorbing more than 90% of their production, they are shielded from currency fluctuation, which is not the case in Mauritius.

This means that it will be important for Mauritius to become an even more efficient producer if it is to remain a competitive and sustainable supplier to the EU. Flexibility to supply different markets will also be important as, when market conditions are unattractive in the EU, there can be opportunities in other markets, such as the African continent, which the Mauritian industry could take advantage of.

1.5 Measures

In the past, the proceeds from Mauritius' preferential access to the EU allowed the sugar industry to make important and valuable contributions to Mauritian society. The current price drop, a foreteller of the post-2017 situation, calls for a different approach. Transfers are made in many countries to support agriculture and ensure that land remains under commercial production; it is time now for Mauritius to embark on such a venture.

The measures recommended by this report refer to:

- The preservation of land under cane in difficult areas, a measure recommended in the MAAS but never implemented.
- Reform of institutions to lower the charge (cess) on industry proceeds and grant greater freedom in sales and marketing.
- Alignment of terms of employment with those in other sectors of the Mauritian economy.
- A more attractive payment for bagasse and cane biomass.
- The mandatory blending of ethanol and gasoline with a premium for ethanol.
- A higher contribution by distiller-bottlers for potable alcohol used for the home market.

- Taxing fossil fuels and transferring the proceeds to foster biomass energy.
- Introducing a custom duty on imports of direct consumption sugar for refining to ensure that the producer community derives benefits from the sale of sugar on the domestic market.
- The use of reserves of the producers accumulated at the Sugar Insurance Fund to allow the industry, at least for a certain number of years, to attain its viability price while the above-mentioned measures are implemented.

In the developed world, transfers are from public funds. This may not be possible in the case of Mauritius, but it can tap resources from environment funds worldwide that are in particular available for Small Island Developing States (SIDS).

1.6 Timeframes

The MAAS was formulated for a period of 10 years, 2006 to 2015 with a mid-term review conducted in 2010. The next adaptation strategy also warrants a similar approach, that is a new ten year timeframe, 2015 to 2024, with a mid-term review.

The duration of the first tier of the new MAAS is guided by several factors:

- The length of the new marketing arrangements being negotiated by the MSS, 2015 to 2018 crops.
- The time-span of the new collective agreement between employers and employees in the sugar sector.
- The time called for to implement measures needed to allow the country to stand up to fierce competition.

Some of the measures envisioned refer to:

- Reduction of the expenditure of institutions, as well as the re-engineering of MCIA, MSS and SIFB.
- The time taken to optimise industrial capacity, including a new framework whereby millers and planters would collaborate to ensure adequacy of cane supply.
- The broadening of the sector's marketing focus from EU market to one that also includes regional markets, as MSS has already begun to do.
- Development of further value-adding activities, including establishment of a sugar hub.
- The time period over which surplus funds available at the Sugar Insurance Fund could be used to assist the process of transition.

The mid-term review of 2018 would take stock of progress achieved in the implementation of the MAAS 2 and, taking account of market circumstances, advise on the date of entry of the full liberalisation of the sugar sector. This would include a review of the scope of role of MSS and the full integration of the sugar sector into the overall economy. The mid-term review would also give a pronouncement on the need to shift away from sugar to energy or otherwise.

Section 2: Stocktaking – Implementation of the MAAS

The Multi Annual Adaptation Strategy (MAAS) 2006-2015, which followed the 2001-2005 Sugar Sector Strategic Plan (SSSP), contained a comprehensive set of recommendations. A certain number of them were implemented albeit in some cases with considerable delays.

2.1 Plus points

The plus points arising from the implementation of these measures of the MAAS and of related decisions can be summed up as follows:

- The country has secured entitlements for grants from under the EU Accompanying Measures to the tune of €250 million and actual receipts would amount to some €238 million;
- Mauritius has benefited from concessionary finance for modernisation programmes pursuant to the ACP/EU Joint Council of Ministers Decision of May 2006 taken in Port Moresby, Papua New Guinea;
- 100% of exports are in the form of value added sugars, specials and refined;
- The country has developed a market strategy which has brought it closer to the market than during the pre-2009 Tate & Lyle days when the refiner stood between Mauritius and the market;
- The Südzucker/Mauritius Sugar Syndicate(MSS) Long Term Partnership Agreement (LTPA) starting in 2009, with its merits and shortcomings, has procured higher revenue to the country and has allowed the transition from raw sugar for refining in the EU to white sugar produced in Mauritius for direct consumption in the EU;
- The Südzucker venture has allowed the Mauritius Sugar Syndicate (MSS) and sugar producers to have a better knowledge of the workings of the EU market and has paved the way for a deeper penetration of the EU market. Mauritius has the possibility to secure further value addition through a *filière* approach, which was not possible in 2009 when the Sugar Protocol was phased out and the LTPA was concluded;
- The industrial set-up, which required considerable investments, some US$110 million, will be in a position to produce and export refined sugar at more competitive prices once its debt servicing is completed in 2015;
- The tolerance afforded by the EU allowing up to 15% by value of exports to the EU to be made up of 15% of Non-Originating Sugars (NOS) has to a substantial extent mitigated the impact of decreasing production. Moreover, it has allowed land to be used for developmental needs and ensured higher use of the industrial set-up, as well as provided higher revenue to all producers, large and small;
- The then Mauritius Sugar Authority (MSA) was able in three weeks in December 2007 to process the cash compensation of some 6,800 employees who had accepted to avail themselves of offers of voluntary retirement;
- Cost of running service providing institutions has been reduced by nearly 50%;
- The Fairtrade Initiative spearheaded by the MSS, and boosted by measures taken in August and December 2010, has proved to be quite successful and useful to small cooperative planters. Some 5,000 of them export roughly 22,000 tonnes of sugar; and some US$78 (MUR2,340 at US$1=MUR30) additional premium is obtained by these planters per tonne of sugar so traded;

- The Planter Harvest Scheme boosted in 2010 has proved to be useful in quite a few cases;
- The liberalisation of the import of sugar for the local market has allowed operators other than the MSS to enter the market;
- Some SMEs engaged in producing for instance sugar cubes and spice-scented sugars involving persons not coming from a planter background have cropped up and operate successfully;
- Cane quality has improved through the introduction of purity thresholds.

From the investment perspective, the following is relevant:

- The cost of the various voluntary retirement schemes for field and factory employees has totalled €195 million including the last factory closure, of which €94 million came from Accompanying Measures; transfers to employees in terms of cash and kind, monetary value of land with infrastructure, compensation would amount to €220 million or MUR8.8 billion;
- Value addition, namely two refineries and special sugar facilities, projects in the sugar sector represent US$110 million (€85 million at €1=US$1.30);
- The Power plant at La Baraque plus the ethanol cluster, the carbon burn out plant and the energy plant would cost €140 million;
- €80 million will be spent on the FORIP by 2015, all met from Accompanying Measures transiting through the Government Budget;
- Total investments represent €500 million.

The SIFB was not considered in the MAAS as a contributor of resources; nonetheless, it has on several occasions supported the industry, with premium discounts of 10% in 2009, 70% in 2010 and thereafter a legal discount of 50% as from 2011. Currently, the SIFB has reserves worth MUR 6 billion, 28% thereof being used to provide special assistance and a premium waiver, subsequent to an Actuarial Review, to all sugar producers for the 2014 and 2015 crops.

2.2 Negative points

The negative points from the economic and social perspectives are as follows:

- The implementation of the SSSP, finalised in August 2001, started immediately; that of the MAAS, approved in April 2006, commenced in December 2007;
- Mauritius risks the loss of €10 million. This comprises €6 million as no tenders were launched for a new high efficiency coal plant and €4 million as no policy has been put in place for the blending of ethanol and mogas;
- Cost of production has come down but not to the extent required to face further challenges as labour costs have continued increasing and the rigidities and uncertainties of the labour market have remained;
- Labour costs increase in the sugar sector are brought about by the compounding of two elements, firstly, the percentages agreed in the context of collective agreements, and secondly, the cost of living allowances; in most other sectors of the economy, only the second element prevails;

- New labour legislation enacted in 2008 is such that in actual fact it privileges strike action as opposed to arbitration in cases of labour disputes;
- Administrative delays have resulted in employees encountering substantial delays in receiving their land entitlements;
- The recouping of sugar reform costs by entities having incurred such costs has been slow due to administrative delays;
- These delays are partly explained by the absence of clear transparent guidelines on land use that are available to both operators and deciders, as well as by the grey area between the developmental needs of an ambitious economy an agricultural needs and the wrong perception that Mauritius can be self-sufficient in its food needs when it has to import most of its major requirements such as cereals, edible oil, pulses, meat and milk, and feed for poultry (maize and soybean oilcake);
- In 2004, there were approximately 27,500 small and medium planters. The number has fallen below 17,000 in 2013, a drop of some 40%. This has occurred in spite of the fact that small and medium planters benefit from a high level of sugar and by-product entitlements, favourable tax regimes and concessionary finance. Moreover, Government has already injected some €70 million in the Field Operations Regrouping and Irrigation Project (FORIP) project and is likely to disburse a further €10 million in 2015.
- Initiated in 2006/07, the FORIP had the twin objective of, firstly, regrouping planters to enable them to benefit from economies of scale and, secondly, preparing the regrouped land for full mechanisation of cultural operations. The project was on target up to 2009 and thereafter it has deviated from these objectives and planters have not been geared to face the formidable challenges ahead;
- Small and medium planters who are not required by law to maintain a permanent labour force and who do not enjoy economies of scale incur 1.5% wage increase for every 1% increase incurred by the larger planters;
- Efforts to foster voluntary negotiated cane cultivation agreements between planters and the corporate sector were thwarted by the Commission for the Democratisation of the Economy;
- On 5 December 2007, Government and the Mauritius Sugar Producers Association (MSPA) concluded an Agreement on the sugar reform envisioned in the MAAS. *Inter alia*, the Agreement made provision for a higher level of equity participation of partners of the sugar industry in the components of the sugar cluster within mutually agreed parameters; so far, little progress has been achieved, due to no engagement by Government, and benefits from such a venture have not accrued to the recipients;
- Recommended for implementation the reduction of costs of service-providing institutions as from 2007 has taken place in 2012;
- No service providing institutional re-engineering has taken place and overall costs of operation is still high in comparison to sugar prices, at some MUR700 per tonne of sugar in 2013 terms;

2.2.1 Environmental issues

In a context where measures to mitigate the impact of the enhanced greenhouse effect are of paramount importance, the analysis of the MAAS from the environment perspective will focus on the avoidance or otherwise of the emission of additional carbon dioxide.

In this regard, the following is relevant:

- Many environment-friendly measures recommended in the MAAS have either not been implemented or undertaken with considerable delay;
- Cane land harvested has come down from 68,750 hectares in 2005 to some 51,500 hectares in 2014, i.e., a drop of 25% in the carbon sink represented by cane plantations;
- Actual electricity production from bagasse is 350 GWh compared to projections of 600 GWh;
- Lower output from bagasse means that additional coal or high sulphur heavy fuel oil had to be used to the tune of 140,000 tonnes or 55,500 tonnes respectively; in the case of coal, this means the emission of nearly 300,000 tonnes of additional CO2;
- No new bagasse/coal plant project emerged during the lifetime of the MAAS; the Power Purchase Agreement for the 91MW plant at La Baraque was signed in 2004;
- Persistent controversy on Independent Power Plants, no release of high biomass canes, no policy on the use of abandoned land and, in the case of Omnicane, contractual limitations, have not been conducive to higher biomass use;
- Higher fossil fuel usage means higher additional carbon dioxide emission, higher sulphur dioxide emission (this gas is reported by the US Environment Protection Agency (EPA)[1] authorities to cause asthma and broncho constriction), and the presence of carcinogenic poly-naphthalenes in heavy fuel oil;
- No ethanol used in the transport sector. This implies, on one hand, imports of mogas, a fossil fuel whose use emits additional carbon dioxide, and the recourse to maritime transport, a high emitter of CO_2 and, on the other hand, the export of ethanol also using maritime transport;
- While the conversion of land from agricultural to a host of non-agricultural activities are exempted from the payment of land conversion tax, the land used to erect an ethanol cluster has been subjected to land conversion tax to the tune of €90,000 per hectare;
- Efforts to trade land conversion rights to allow a better land use as generally commercially viable land are marginal for agriculture and vice versa have been stifled;
- The recommendation of the MAAS in respect of difficult areas has not been implemented and no measure has been put in place to avoid abandoned land becoming an environmental hazard;
- Compressed Natural Gas (CNG) may in certain conditions be a substitute for coal, but no work has been undertaken thereon, the focus has instead been on Liquefied Natural Gas (LNG).

[1] http://www.epa.gov/oaqps001/sulfurdioxide/health.html

"*Green energy*" and environment friendly endeavours have also been affected by delays in decision making. The cases in point are the ethanol cluster, a coal burn-out project, an energy plant by Omnicane and the possibility to use ethanol in a dual firing mode in gas turbines.

Price negotiations between the Control Board and Omnicane started in September 2009 and the principles of price determination were adjudicated by the Control Board in December 2011. It is only in December 2014 that the MCIA has agreed to the methodology for price determination.

The delays have impacted negatively on a potassic fertiliser recycling project and a carbon dioxide capture plant, both being part of the ethanol cluster. Fertiliser recycling limits imports and reduces maritime transport. Captured carbon dioxide (CO_2) is processed and used in the carbonated soft drink industry and such a use avoids the use of diesel, a fossil fuel.

A new coal burn-out plant, firstly, avoids the disposal of coal ash in dedicated pits as per the terms and conditions of the EIA certificate; and, secondly and more importantly, allows the re-use of the ash to produce energy with the residue being used as an additive to cement. Higher energy from the same amount of coal and lower imports of cement, a high emitter of CO_2, mean lesser CO_2 emission.

Omnicane is still awaiting approval for what is termed an energy plant. This plant is expected to use wood chips, grasses such as the Giant King Grass, the tail and head ends of ethanol distillation, with all three being renewable forms of energy. Green energy will represent more than 50% of the exportable energy of the plant. This plant is a pioneer in that it will pave the way for the use of different forms of renewable sources of energy to produce firm reliable energy.

Investigations were conducted in early 2014 regarding the possibility of having dual-ethanol and kerosene-fired gas turbines. It is reported that the existing 1990s-installed gas turbines cannot accommodate such mixes; however, ethanol using plants exist in Brazil, a major producer of ethanol. There has been no follow-up action on the latter plants.

Part B.6.4 of the Mid Term Review of the MAAS is devoted to the issue of carbon credits. This Part recalls the efforts of Mauritius to secure carbon credits for the La Baraque project, destined to generate some 140 GWh from bagasse, and how the request was turned down in spite of the support of the World Bank.

This happened because of two elements, the scope of the relevant methodology in the Clean Development Mechanism (CDM) dealing with electricity production biomass residues could not cater for bagasse as a resource available only in the crop season; and more importantly, the absence of a cadre regarding special and differential treatment for Small Island Developing States (SIDS), the most vulnerable states regarding climate change.

Sales by EU companies are made mostly in the Eurozone and most supplies come from within the same zone. As a result, currency fluctuations do not affect these producers. In this regard, Mauritius is an exception, where a strong currency policy has disadvantaged export-oriented industries, including the sugar sector.

Section 3: Timeframes

From the EU sugar market perspective, the future should be considered in two distinct periods: (a) from crops 2015 to 2017, when sugar quotas will remain in place and (b) from the 2018 crop, when quotas will no longer apply. The first period was generally expected to be a fairly ordered one and the second period to be characterised by fierce competition among efficient EU producers, resulting in depressed and volatile prices. However, the events that unfolded since January 2014 show that the price depression that was expected from the 2018 crop has bitten much earlier.

This turn of events has important implications for Mauritius and calls for a phased approach to its response. This should comprise an initial transition period to be followed by one in which only commercial considerations would be prime and the special status of sugar in the economy – which is a legacy of history and the times when sugar reigned supreme – would have to be dismantled and the sector would be liberalised. Currently, sugar accounts for around 2% of the GDP and employment; form 2018, this percentage would be less than 1%.

The duration of the first tier of the new MAAS is guided by several factors:

- The length of the new marketing arrangements being negotiated by the MSS, 2015 to 2018 crops.
- The time-span of the forthcoming collective agreement between employers and employees.
- The time called for to implement measures needed to allow the country to stand up to fierce competition, coupled with a price environment characterised by high price volatility as well as frequent price depression.

3.1 The MSS's commitments

The MSS is currently engaged in negotiations with three EU companies with a view to concluding market arrangements for the 2015 to 2018 crops for the sale of white refined sugar.

- Two of its new partners are beet processors; the other is engaged in acquiring sugar from cane and beet sources for packing and distribution and for onward processing.
- Two of the companies are willing to commit for the four crops for all quantities and one, so far, is willing only to commit to 2018 for sugars that are speciality whites, but only until 2016 for bulk whites.
- The arrangements can be renewed and extended after 2018, but would depend on circumstances. Consultation regarding renewal or otherwise will be held during the course of the 2017/18 season.

3.2 New collective agreements

As part of the recent dispute and strike, an agreement has been reached whereby employees would receive an interim wage increase of 7%, 3%, 3% and 0% for years 2014 to 2017.

3.3 Timetable for implementation of measures

Some of the measures envisioned refer to:

- Reduction of the expenditure of institutions, as well as the re-engineering of MCIA, MSS and SIFB.

- The time taken to optimise industrial capacity, including a new framework whereby millers and planters would collaborate to ensure adequacy of cane supply.
- The broadening of the sector's marketing focus from EU market to one that also includes regional markets.
- Development of further value-adding activities, including establishment of a sugar hub.
- The time period over which surplus funds available at the Sugar Insurance Fund could be used to assist the process of transition.

3.4 Timetable

The MAAS was formulated for a period of 10 years, 2006 to 2015 with a mid-term review conducted in 2010. The next adaptation strategy also warrants a similar approach, that is a new ten year timeframe, 2015 to 2024, with a mid-term review.

The Mid-Term Review of 2018 would take stock of progress achieved in the implementation of the MAAS 2 and, taking account of market circumstances, advise on the date of entry of the full liberalisation of the sugar sector. This would include a review of the scope of the role of MSS and the full integration of the sugar sector in the overall economy. The mid-term review would also give a pronouncement on the need to shift away from sugar to energy or otherwise.

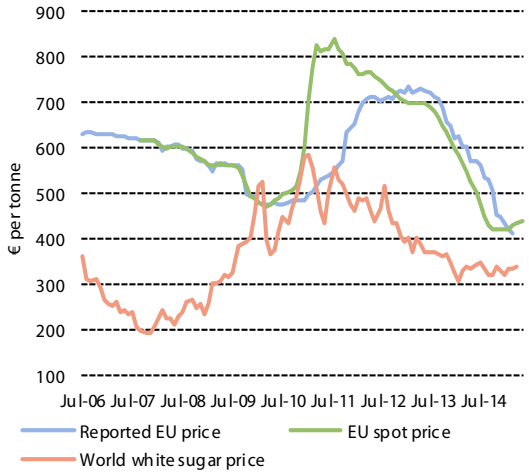
Section 4: Market Outlook

Since 2006, the industry has sought to maximise the value of its output by moving up the value chain, adding white refined sugar to the sales of special sugars and ending the sale of raw sugar. This strategy has focussed on the EU, where Mauritius has duty-free access to a market where prices have typically commanded a sizeable surplus over world market values.

However, the EU sugar market has been through turbulent times in recent years, with prices trading at substantial premiums over the world market in some years and at almost no premium over world white sugar prices in others (Diagram 4.1).

Removal of quotas from 1st October 2017 will alter the landscape of the EU sugar market, ushering in a much more competitive market. Under the current quota system, imports are guaranteed a share of the EU market and this reliance on imports — some of which pay a duty of close to €100/tonne — has been supportive of prices in most years.

Diagram 4.1: EU sugar prices (reported and spot) versus world white sugar prices



The removal of quotas will allow producers of beet sugar and starch-based sweeteners (isoglucose) to increase sales in the internal market. Their willingness to do so will be dictated by their competitiveness vis-à-vis imports. EU beet growers and processors have made huge strides in improving the efficiency of their production, allowing them to raise their competitiveness against imports. This suggests that beet sugar will supply a greater share of internal market demand, largely at the expense of imports. To gain market share, sugar prices in the EU will have to fall to level at which it is no longer attractive for overseas suppliers to ship sugar to the EU. The implication of this is that overseas suppliers will no longer earn a preference from sales in the EU vis-à-vis the world market.

The potential consequences of greater supply in the EU market can be gauged by the recent development of sugar prices. Current weak prices reflect over-supply that has arisen because of a series of "special measures" introduced by the European Commission between 2010/11 and 2012/13 to boost supplies when internal market supply was tight and prices were high. As Diagram 4.1 illustrates, prices have recently dropped towards €400/tonne. Once the industry costs are deducted, there is currently little preference on sales of sugar to the EU over returns from the world market.

While it is difficult to predict how EU market prices will evolve from now to 2017, as well as after quotas are removed, it seems certain that the level of preference will be greatly reduced from its level when the EU relied on substantial supplies of imported sugar. After 2017, it is possible that prices in the EU will fall below the level needed to attract imports. If the Mauritian industry is to maximise its income in the future, then it has two main routes (which we discuss in more detail in *Section 6: Measures*) and, indeed, MSS has already embarked upon these:

- Maximise value added, including sales of special sugars as well as enhancing the value of its white refined sugars through branding ("cane sugar"), quality, etc.
- Seek out markets where the country earns preferential prices, which may not include the EU, but may include East and Southern Africa, principally via COMESA.

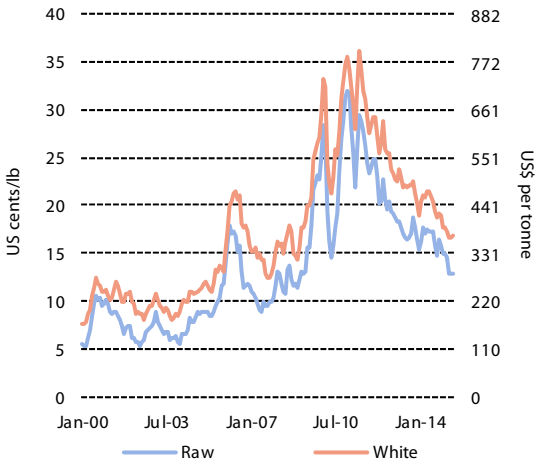
In the remainder of this chapter, we assess the likely returns the industry can expect to earn from sales of sugar in potential target markets: EU, COMESA/SADC and domestic.

4.1 The outlook for sugar prices in key export markets

The outlook for sugar prices in the EU, East and Southern Africa and elsewhere are all linked ultimately to the world sugar price, which has charted a very volatile course over the past decade. As Diagram 4.2 illustrates, prices are currently depressed relative to the very high levels seen between 2010 and 2012. Nevertheless, they remain much higher than the levels that prevailed up to the mid-2000s.

Despite this volatility, it is important to be able to make a judgement about the future level of world sugar prices if we are to be able to comment on the future prospect for Mauritian sugar export returns.

Diagram 4.2: Evolution of world raw and white sugar prices

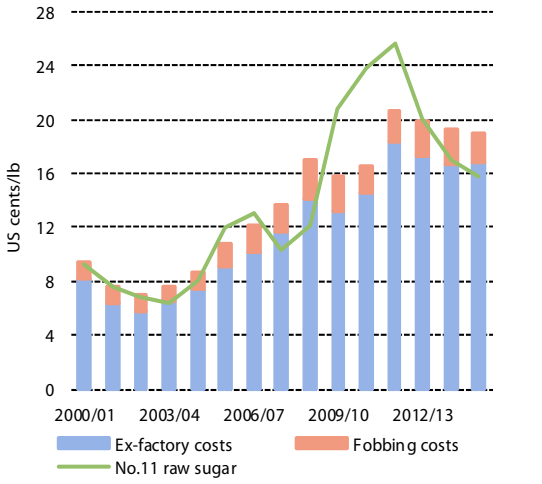


4.1.1 The outlook for world sugar prices

For much of the past 10-15 years, Brazil has been the price-setter in the world sugar market. It has supplied approximately half the world's exports and, in the long term, international sugar prices have had to reflect trends in its costs of production. Over the last 15 years, Brazil's costs have more than doubled in dollar terms and world sugar followed, rising from 5-10 cents/lb in the first half of last decade to an average of over 20 cents/lb during the past five years (Diagram 4.3). *This explains the rise in world prices between 2000 and 2010.*

For much of this period, the Brazilian industry grew rapidly, allowing it to supply sugar to the world market and ethanol to a booming domestic fleet of flex-fuel vehicles.

Diagram 4.3: Brazil's raw sugar production costs vs. world raw sugar prices



Note: Costs include an allowance for a return on capital employed.

However, a major change happened towards the end of last decade, when the sector ran into financial difficulties. This reflected the sector's inability to produce ethanol competitively against gasoline, whose price is set by the Brazilian government and has been held below international levels most of the time. The result was a sudden end of the investment boom. By this time, the world had become heavily reliant on continued expansion in Brazil. So, when it was unable to respond to the international market's growing needs, prices soared, ushering in a period of extremely high world sugar prices. *This explains the period of very high prices between 2010 and 2012.*

These high sugar prices did the job they were intended to: they encouraged farmers around the world to grow more beet and cane, and global sugar production increased sharply.

International prices started to moderate as these surpluses hit the market and they eventually slumped in the face of a series of global production surpluses. *This explains the decline is sugar prices since 2012*.

What next?

This is where we find ourselves today. Yet, we know that global demand for sugar is still rising. This demand growth will eventually erode the global surpluses and absorb current beet and cane processing capacity and thereby require further investment in the sector. This raises two sets of questions:

1. When will prices have to rise to stimulate new investment and at what level will they trade in the meantime?

2. How high will they have to rise when they have to attract new investment?

The reasoning behind our answers to these questions is summarised below.

Short/medium term outlook

We estimate there is still surplus processing capacity around the world, mainly in Asia and in Europe, and this could be adequate to supply the world's needs for another few years. This does not mean that the world will always produce surpluses, because prices may not always be high enough to encourage farmers to plant enough beet or cane to meet global demand. However, it means that processors will not have to make significant investments in processing capacity.

As long as this situation persists, prices will continues to be influenced by the complex dynamic that exists between the global sugar market and Brazil's domestic ethanol market. A further complication is the currency movements of major sugar-producing countries, many of which have recently depreciated against the dollar. All of this points to world raw prices remaining subdued below 20 cents/lb for much of the next few years.

Longer term outlook

Eventually, we expect world prices to move to a higher level — around 20 cents/lb — to stimulate new investment in the sector. Although this price level is higher than where the market has traded recently, we believe the prices will have to recover to these levels if fast-growing global sugar demand is to be met:

- ***Much below 20 cents/lb***, there is upward pressure on prices. At recent, depressed price levels, there will be insufficient incentive for processors to invest in new capacity. This will eventually place huge demands on Brazil to produce additional sugar from its existing cane crop (at the expense of ethanol). However, there is a limit to how much more sugar more sugar Brazilian mills can produce at the expense of ethanol.

- ***Above 20 cents/lb***, there would be downward ***pressure on prices***. If prices were to be sustained above this level, there would be an incentive for production to expand in many parts of the world. This would raise production more quickly than demand, eventually placing downward pressure on prices.

For the purposes of the analysis that follows, we assume a world raw sugar price of 20 cents/lb as our baseline projection. However, as prices will fluctuate around this level, we have also simulated the implications for Mauritius' export earnings of low and high world prices scenarios, of 15 cents/lb and 25 cents/lb, respectively. This will allow us to highlight the broad range of outcomes the industry can expect as we look to the future.

In particular, it is important to keep in mind that prices are currently much lower than the above range. Prices have traded below 20 cents/lb for the last couple of years and, at times in 2015, have dropped as low as 12 cents/lb. A series of global surpluses and sufficient global production capacity mean that it could be some years before world prices recover to 20 cents/lb. Therefore, the outlook based on a world price of 15 cents/lb is an important one to keep in mind.

4.1.2 The outlook for sugar prices in the EU

From 1st October 2017, the EU will abolish quotas on domestic beet sugar and isoglucose sales in the internal market. This will result in a more competitive market, which will narrow, and possibly eliminate, the premium at which prices in the EU trade over world white sugar values.

In the pages that follow, we will assess the outlook for sugar price in the EU once quotas are lifted. However, the Mauritian industry has committed to sell most of its sugar (white refined sugars [WRS] and specials) to sugar companies in the EU up to an including the 2018 crop. For much of this time, quotas will still be in place. For this reason, we shall first discuss current circumstances in the EU and how they can be expected to evolve up until 30th September 2017. We then turn to the outlook after quotas.

Prospects for the EU sugar market to 30th September 2017

There have been huge swings in sugar prices in the EU since the last reform was implemented in 2006. These are revealed in Diagram 4.1 above and show prices initially drifting lower (eventually dropping below €500 per tonne), before soaring to levels above €700 (with spot prices trading at even higher levels than this), and then tumbling again. At the time of writing, spot prices, as well as prices reported by the European Commission, were both close to €400 per tonne.

In this section, we explain reasons for this price volatility and the prospects for prices over the next few years. To do this, we must recall the rationale for the 2006 reforms. A central pillar of the reform was the reduction of quotas to around 13 million tonnes. One of the reasons for this was that the Everything But Arms (EBA) agreement allowed unlimited, duty-free access for imports from Least Developed Countries (LDCs). *In other words, domestic production was to be cut back in order to make room for more imports.*

While the reforms proceeded more-or-less according to plan up 2009/10, the situation changed thereafter. There were two main reasons for this.

- First, there was a structural increase in world sugar prices, the causes of which are discussed above.
- Second, the supply of duty-free imports under the EBA and new Economic Partnership Agreements (EPAs) did not increase as much as had been expected.

Supply from ACP/LDC sugar industries

At the time of the 2006 reforms, it was expected that sugar producers in LDC/ACP industries would expand production to meet the EU's increased import demand that would result from the reduction in quotas. However, this did not happen for a number of reasons:

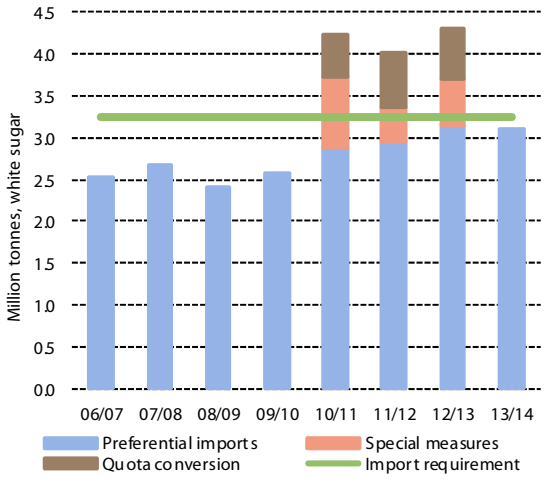
- Some ACP industries — such as Mauritius, Fiji and Guyana — experienced a decline in their production.
- Expansion of production in some LDCs —notably Ethiopia and Sudan — has been much slower than expected.
- High world prices created attractive opportunities for some of the EU's preferential suppliers to sell sugar in other markets.

The consequences of these developments were that production in LDC/ ACP countries was broadly static at an aggregated level between 2005 and 2010 and, with local consumption rising, exports to the EU did not increase.

The implications of this can be seen in Diagram 4.4, which compares imports into the EU from preferential suppliers (in addition to LDC/ACP countries, this also includes sugar under the CXL and West Balkan quotas) with the 3.3 million tonnes required each year to keep stock levels in the EU constant. This reveals that imports consistently fell short of the amount required to prevent stocks from dwindling.

As a result, stocks were drawn down over several years and, as shortages of sugar began to appear in parts of Europe in 2010, spot market prices rose steeply.

Diagram 4.4: Evolution of EU imports



Exceptional measures

In order to counter the low level of stocks, the European Commission (EC) could have allowed prices in the EU to rise to the level needed to attract sugar from the world market. However, under pressure to prevent prices from rising to the very high prices this would have required (owing to the inflated level of world sugar prices and the high MFN duties levied on world market imports), the Commission introduced a number of *exceptional measures* to supplement supplies. These have included duty-free quotas for imports, an import quota tendering scheme, as well as reclassification of out-of-quota sugar production into quota sugar.

Between 2010/11 and 2012/13, the EC has allowed approximately three million tonnes of *exceptional sugars* into the quota market. Ultimately, these exceptional measures have resulted in the internal market becoming over-supplied and this is the cause for the downturn in prices since 2013 and their current depressed levels (which are exacerbated by low world sugar prices).

Near term outlook for prices

Sugar prices in the EU will remain repressed for as long as there is an overhang of stocks in the market. With beet sugar and isoglucose producers more-or-less filling their quotas each year, the only way for stocks to fall is if imports once again drop below the level needed to balance the market. This has already started to happen, because prices have dropped below the level that can attract reduced-duty sugar (the 0.7 million tonnes of CXL sugars that pays a duty of €98 per tonne) into the EU market. However, the extent to which this translates into a fall in EU stocks will depend on the inflow of sugar from duty-free origins.

Given the low level of world sugar prices, and the substantial level of stocks that are currently burdening many origin countries, the EU is still attracting imports of duty-free sugar. In 2013/14, imports of duty-free sugars exceeded the previous year's level, although there are now signs that some countries will not supply the EU in the future. With world market prices expected to remain depressed, sugar prices in the EU are likely to remain below €450, ex-works in 2014/15. After this, reduced imports will lead to lower stocks, which will eventually support high prices and should result in prices within the EU having to reflect the cost of importing duty-paying CXL sugar again. This should push prices back above €500 per tonne.

However, this recovery is likely to be short-lived. With the end of quotas coming into sight, end-users will be willing to run down stocks in anticipation of surge in supply once beet sugar and isoglucose producers are free to sell as much sugar as they wish within the EU from 1st October 2017. This suggests prices are unlikely to exceed €500-550 per tonne prior to the elimination of quotas.

Prospects for the EU sugar market after quotas are removed

In the absence of quotas, the landscape of the EU sweetener market will be determined by competition between the three main sources of supply: *beet sugar*, *imported sugar* (white sugar as well as raw sugar for refining in the EU) and *isoglucose*. Given that potential supply of these sweeteners in the absence of quotas far exceeds domestic demand, the future supply base will reflect the most cost-competitive sources of supply. LMC has carried out a detailed analysis of the outlook for the EU market; the main findings are summarised here.

The reason why it is difficult to define the outcome of this competition is that the cost base of each sweetener is not fixed, but is linked to prevailing world market prices of grains and sugar.

- For beet sugar, this is because farmers can chose between growing beets and other crops on their land (principally wheat or maize, but also rapeseed in some areas). They must therefore be paid a price that generates a similar return as these alternative crops. This, in turn, depends on the price of these alternative crops and *creates a link between the supply cost of beet sugar and world grain prices (to which the cost of processing must be added).*

- Isoglucose is produced from grains. *This creates a clear link between the cost of producing isoglucose and world grain prices (plus the cost of processing)*.

- In the case of imports, overseas suppliers must be paid a price that is at least as high as that which they can earn from sales in other markets. For industries that produce surpluses over their domestic needs, this price is either the world market or, in some cases, regional prices. *This creates a link between the supply cost of imports and the world sugar price (to which the cost of logistics and refining must be added).*

Analysis of the cost structure of each sweetener shows that world sugar prices make up a greater part of the supply cost of imports than grain prices do for either isoglucose or beet sugar. This means that when world sugar prices are low, it improves the competitiveness of imported sugar vis-à-vis the other sweeteners, and *vice versa*. This logic of argument is summarised in Diagram 4.5.

Based on the supply cost of various sweetener sources, and the quantities available from each, we have estimated the likely future level of sugar price in the EU across a range of different world sugar prices[1]. The resulting sugar price is defined by the marginal tonne of sweetener that is needed to supply the EU's internal market needs. This is the price level required for the EU market to be adequately supplied in each situation. It also assumes that sugar prices in the EU trade at a premium over producers' full costs to generate 10% profit margin.

Diagram 4.5: The relationship between world and EU price once quotas are abolished

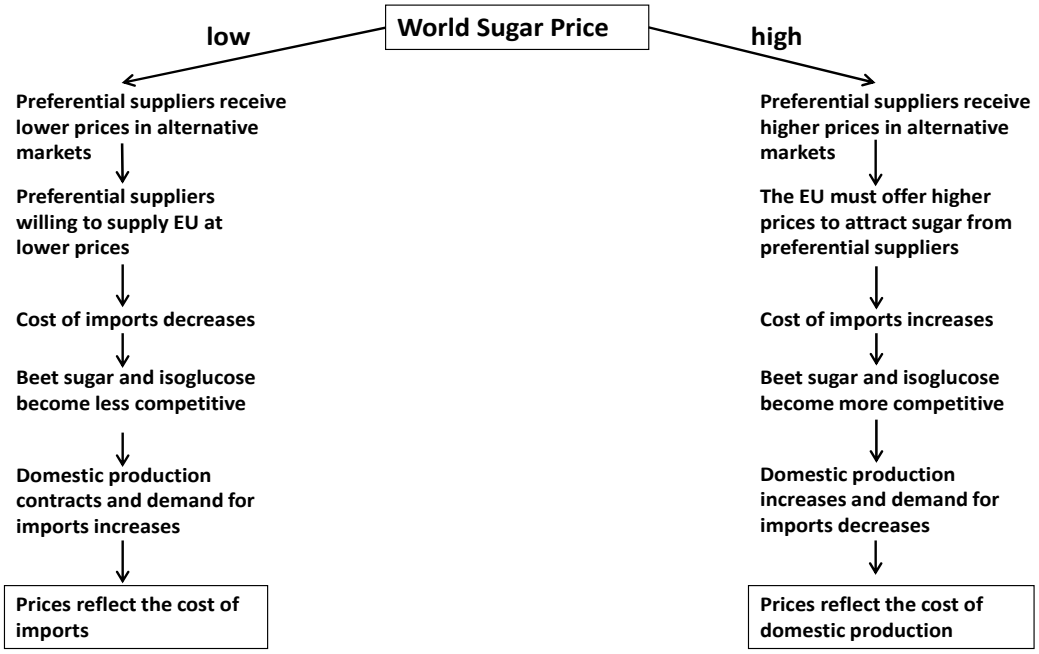


Table 4.1 presents projections for EU prices, which are expressed on a delivered customer basis and therefore include transport costs of around €25-70 per tonne depending on the destination. Prices are shown at three world sugar price scenarios (and an associated wheat price). It shows delivered prices ranging between €460 and €520 per tonne. In December 2014, the European Commission recently presented its forecasts of sugar prices in the EU in a report entitled, *Prospects for EU agricultural markets and income 2014*-2024. Its forecasts envisage ex-works prices around €415-450, which equate to delivered market prices of €465-500, assuming an average cost of €50 for delivery to customers.

More importantly, however, is the future level of preference Mauritius can expect to receive *relative* to the world market. This is the preference from sales to the EU. This is calculated in the final three rows of the table, in which we present (a) the premium of EU white sugar prices over the world raw sugar price, (b) the costs of importing and refining white sugar in the EU and (c) the implied preference in the EU.

[1] We have assumed that grain values move proportionally with sugar prices and that a world raw sugar price of 20 cents/lb is comparable with a wheat price in the EU of €180 per tonne. In reality, sugar and grain prices are not linked in the short to medium term and so this relationship will not hold at any one point in time.

The preference is calculated as the price premium (a) minus the cost of importing and refining raw sugar (b). This suggests that sugar prices in the EU will exceed import parity values *only* when the world sugar price is weak (i.e., close to 15 cents/ lb), which is when imports are best able to compete with beet sugar. However, in these circumstances, return from the EU would be depressed by low market prices, even if they are attractive *relative* to world prices.

Our estimate of the composition of supply under each outcome is illustrated in Diagram 4.6. This highlights the point made earlier, namely that imports are likely to form a larger part of the supply base if world sugar prices are low relative to grains.

These outcomes assume the EU will continue to import cane sugar, even when it is expensive relative to beet sugar, because some consumers have a preference for cane sugar, in particular special sugars and Fairtrade sugar. This minimum is hard to define and will depend on the ability of suppliers to market and brand their products. We have assumed this figure is 500,000 tonnes[2].

Diagram 4.6: Estimated composition of EU market supply at different world sugar prices

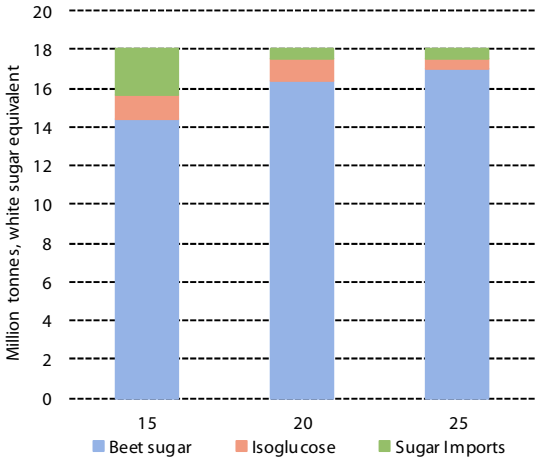


Table 4.1: Projected EU sugar prices, delivered customer, and EU *preference*

		Low	Average	High
World raw sugar price	Cents/lb	15	20	25
EU wheat price	€/tonne	135	180	220
EU sugar price	€/tonne	460	500	520
EU sugar price	US$/tonne	613	666	693
Premium over world raw sugar price	US$/tonne	282	225	141
Estimated cost of importing and refining raw sugar in EU	US$/tonne	248	256	270
Value of *preference*	**US$/tonne**	**34**	**-31**	**-128**

Note: Our analysis of the future EU sugar market has been conducted using a long run US$/€ exchange rate of 1.33, which understates the current value of the US dollar (US$1.25/€).

However, there is a real risk that prices in the surplus sugar-producing regions of the EU – North West Europe – will be driven down towards world market levels by severe competition. This risk will be greatest during the first years after the lifting of quotas when beet sugar producers will be fighting against each other and against imports for market, and the large surpluses generated during this period have to be exported to the world market.

Conclusions

Pre-2017

Current over-supply in the sugar market means prices are depressed. Ex-works prices are likely to remain below €450 per tonne in 2014/15. Although prices should firm in 2015/16 and 2016/17, as EU stocks are drawn down and world prices pick up, the prospect of quotas being removed on 1st October 2017 will hang over the market and prices are unlikely to exceed €500-550 per tonne before quotas are lifted.

[2] We assume a similar minimum for isoglucose, as 0.7 million tonnes of capacity already exists and has well-established markets, part of it in markets where sugar production is limited/high cost.

Post-2017

The principal findings of our analysis of the elimination of quotas are:

- Beet sugar production will expand and assume a larger share of the market.
- This will squeeze out a significant part of current imports.
- Prices in the EU will drop below the cost of importing raw sugar and refining it.
- In the immediate aftermath of quotas being lifted, the market is likely to become very competitive, and prices within the EU may fall to reflect export values (i.e., the world white sugar price).

The conclusions of this for Mauritius are that the *preference* it can expect from selling white refined sugar in the EU will disappear. Instead, the premium that the industry can expect to earn from sales in the EU will be determined by:

- Its ability to generate a premium for WRS sugar, which is based on it being derived from cane, its quality etc. This will depend on the success of marketing and branding.
- Its ability to generate premiums for special sugar and for Fairtrade sugar. This will also depend on the success of marketing and branding.

The only circumstances under which imports are likely to gain market share against beet sugar is when world prices are low – we estimate this to be well below 20 cents/lb. However, at this level of world prices, the net-back price of sugar in Mauritius will be low.

4.1.3 The outlook for prices in regional markets

The erosion of preference on sales to the EU will increase the potential value of sales into regional deficit markets in which Mauritius has duty preference. This includes markets for refined and brown sugar in COMESA and SADC. In this section, we summarise the analysis of the regional markets in eastern and southern Africa.

To gauge the prospects for sales in these markets, we have projected future production and consumption in each country to identify potential deficit markets and to identify the countries from which Mauritius can expect to face competition in these markets. Based on this, we project likely future prices for brown and refined sugar. The results of our analysis, which we discuss further below, are summarized in Table 4.2 at three levels of the world raw sugar price: 15, 20 and 25 cents/lb.

Table 4.2: Projected sugar prices in the regional market

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. brown sugar price	US$/tonne	520	570	690
c.i.f. import price brown sugar + US$200	US$/tonne	720	770	890
c.i.f. import price of refined sugar	US$/tonne	530	670	800

The brown sugar market and prices

Brown sugar is consumed widely across the region. The largest potential market for Mauritius will be **Kenya**, whose current deficit (0.35 million tonnes) is expected to expand to over 0.5 million tonnes by 2025, and much of this demand will be for brown sugar. Mauritius has

duty-free access to this market via COMESA, although Kenya uses a quota to restrict duty-free imports from other COMESA members to 340,000 tonnes. However, it is committed to removing this quota in the future.

Other potential markets include **Tanzania** and **Madagascar**, who currently have a combined deficit of around 300-400,000 tonnes. As with Kenya, rising incomes and population growth will see this deficit widen in the future.

- Access to Tanzania is complicated by the fact that it is not a member of COMESA. Although Tanzania and Mauritius are both members of SADC, which should permit unrestricted and duty-free trade, Tanzania has been able to impose temporary duties against sugar imports from SADC to protect its domestic producers. At present, Tanzania enforces a 25% duty on imports from SADC; in theory it should be 0%. It can also use licences to control imports.

- Access is less of an issue in Madagascar. As well as being part of both SADC and COMESA, Madagascar and Mauritius are both part of the Indian Ocean Commission. This agreement provides Mauritius with duty-free access to the Malagasy market.

It is important to note that a number of surplus sugar producers in southern Africa also have duty-free access to these markets. Currently, these producers export only small quantities of sugar to these markets, because they are focused on supplying the EU. For much of the period since 2006, wholesale prices in Kenya have therefore carried a premium of well over US$200 per tonne above the cost of duty-free imports from within COMESA (Diagram 4.7). This reflects the relatively small quantities of sugar that have entered Kenya from other countries within COMESA and that imports from outside COMESA carry a 100% duty.

However, the erosion of the EU preference means that producers within the region will be more willing to supply deficit markets within the region, such as Kenya, and this will intensify competition. There is therefore a risk that this premium will be squeezed if regional producers export greater quantities to Kenya. The magnitude of this risk will depend on the market balance in COMESA, which we depict in Diagram 4.7).

Diagram 4.7: Premium of Kenyan wholesale prices over duty-free imports from COMESA

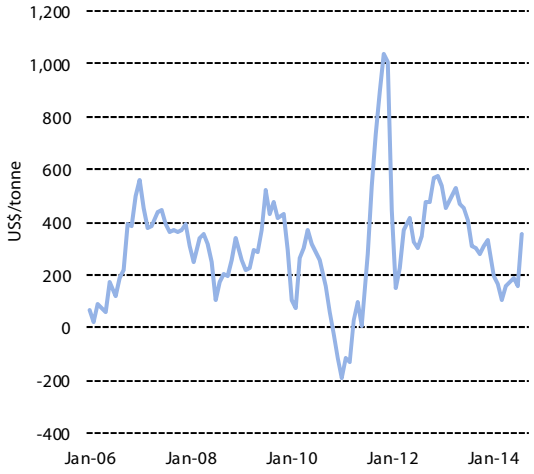
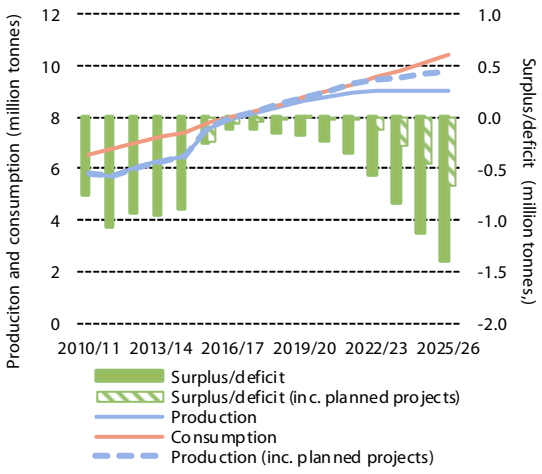


Diagram 4.8: Projected market balance in COMESA



Although, COMESA may approach self-sufficiency over the next few years as a result of expansion of output, particularly in Ethiopia, a large deficit can be expected post-2020 unless there is considerable further investment. This suggests that there is still potential for a

premium in Kenya, as prices will need to be high enough to attract some duty-paying sugar into the country. However, the premium is likely to be volatile, reflecting regional market circumstances and government policy reactions to these. In view of this uncertainty, we consider two different levels of the Kenyan market premium: US$200 and US$0 per tonne over the cost of duty-free imports (Table 4.2).

The refined sugar market and prices

As millers in Kenya, Tanzania and Madagascar are focused on producing brown or plantation white sugar, refined sugar for industrial end-users is supplied solely by imports. In Kenya, the size of the industrial sugar market is around 150-200,000 tonnes. Between them, Tanzania and Madagascar add a further 100-150,000 tonnes, while Uganda is another large market that imports all its refined sugar.

Importantly, governments in these countries adopt less protectionist trade policies towards refined sugar than brown sugar so as not to penalise investors in their industrial sectors. For example, Tanzania has applied 25% duties plus licensing requirements on brown sugar imports even from within SADC, whereas imports of refined sugar from the world market are subject only to a 10% duty.

Limited refining capacity within the region results in most imports currently being supplied from refiners in South Africa and the Middle East. This means Mauritius should be well-placed to supply these markets. However, the size of the 10% duty preference for refined sugar is less than for brown sugar. Moreover, there is a risk that even this modest duty preference could be reduced if Mauritius diverts too much sugar to the region at the same time as other producers in Southern Africa utilise their refining capacities more fully once they reduce shipments of raw sugar to the EU.

4.2 Ex-Syndicate sugar prices from sales to different markets

To be able to compare the returns that millers and planters in Mauritius can expect to earn from these sales, we convert them onto an ex-Syndicate basis. Where relevant, we also carry out sensitivity analyses to gauge the impact of potential risks and future policy measures. The prices shown assume the current cess of 4%. Table 4.3 summarizes our results for each market at three different levels of the world price: 15, 20 and 25 cents/lb (we have provided more detailed information about how we derive these prices at the end of this section). In addition to our *base case* outcomes, we also indicate the impact of the various risks we have identified. Diagram 4.9 presents these prices in our average world price scenario of 20 cents/lb, while Diagram 4.10 does this for the 15 cent/lb that is more reflective of the world market situation in the near future.

Table 4.3: Ex-Syndicate prices associated with sales to different markets

World raw sugar price (cents/lb)	Scenario	Low 15	Average 20	High 25
Refined sugar to the EU	**Base case**	**11,290**	**12,850**	**13,620**
	EU prices reflect 5% EBIT margin	10,620	11,770	12,920
Special sugar to the EU	**Base case**	**14,650**	**16,390**	**17,260**
	Erosion of premium on special sugars to 10%	12,570	14,100	14,860
Brown sugar to Kenya	**Base case**	**16,530**	**17,830**	**20,960**
	Prices reflect duty-free brown imports from COMESA	11,310	12,620	15,750
Refined sugar to region	**Base case**	**10,870**	**14,950**	**18,740**
	Prices reflect duty-free refined imports from COMESA	11,450	12,910	16,400

Diagram 4.9: Ex-Syndicate prices from sales to different markets at a world price of 20 cents/lb

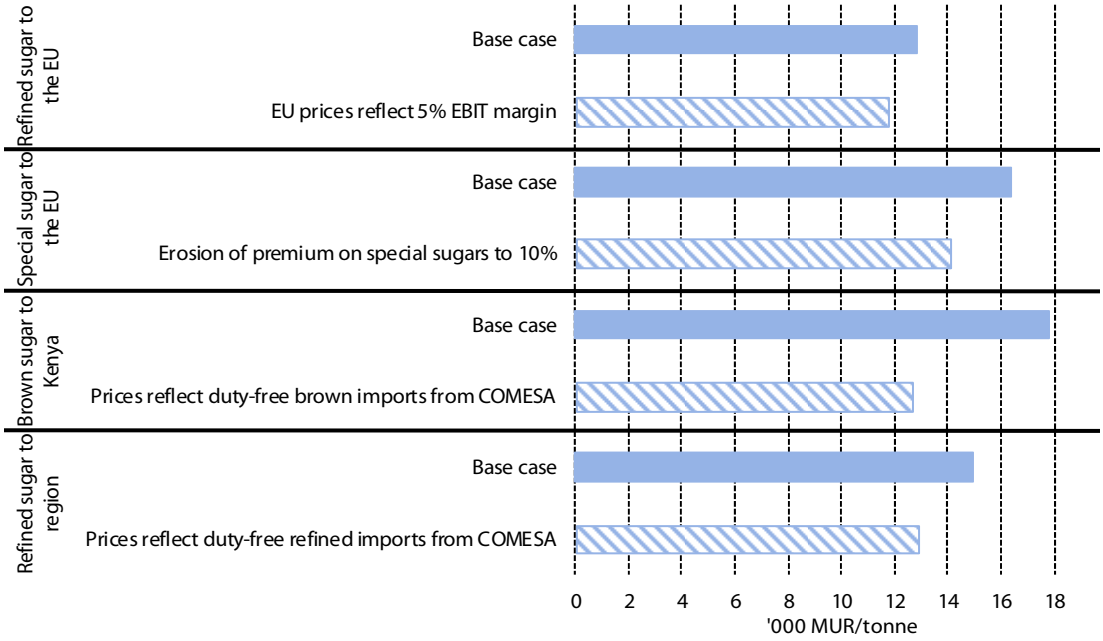
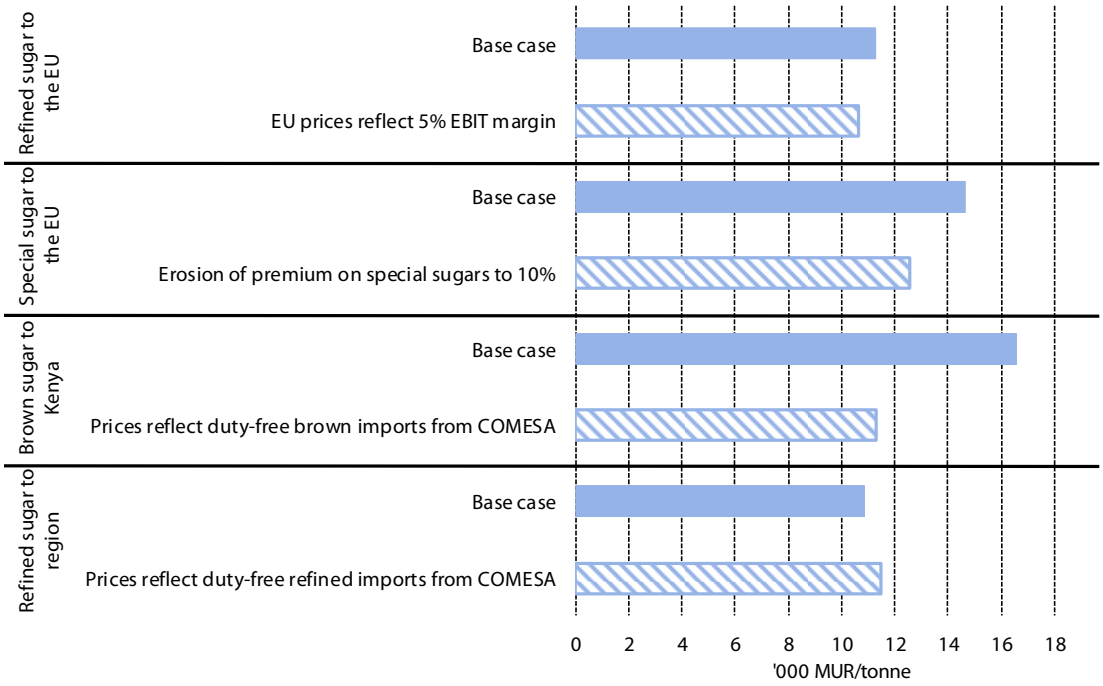


Diagram 4.10: Ex-Syndicate prices from sales to different markets at a world price of 15 cents/lb



Perhaps the most striking conclusion of this analysis is that no one market stands out as offering the best return in the future when one allows for the market risks associated with it. Furthermore, at a world price of 15 cents/lb, only brown sugar sales to Kenya are able to offer ex-Syndicate returns of much over MUR14,000/tonne, and this too is dependent on Kenyan prices being able to maintain a large premium over the duty-free cost of COMESA imports.

This is an important observation because, as we discuss above, it could still take some time for world prices to recover to 20 cents/lb.

- The most attractive markets are likely to be the brown sugar market in Kenya and special sugars market in the EU. By contrast, the WRS market in the EU is likely to offer modest returns compared to other options unless the industry can secure significant premiums over beet sugar as a result of marketing and branding efforts, as well as other value-adding initiatives.

- Even sales of refined sugar to regional markets may be more attractive than the EU, despite the fact that governments in these countries adopt less protectionist policies towards refined sugar imports than on brown sugar. This means that this avenue could provide a more stable market for Mauritius than brown sugar.

- By contrast, sales of brown sugar to Kenya and special sugar sales face price risks. In the case of brown sugar sales to Kenya, these stem from possible over-supply and government import restrictions that may result from sugar being diverted from the EU back into the region. In the case of special sugars, this derives from increased competition from other suppliers.

4.3 Planters' price

In addition to the ex-Syndicate price, planters earn premiums from sales of molasses, bagasse for power generation and, more recently, from sales of potable alcohol in the local market. The combined value of these premiums in recent years are summarised in Table 4.4. Category 1 refers to mill-owned estates; Category 2 refers to all planters. The combined value of these premiums currently amounts to approximately MUR1,000 per tonne sugar.

Table 4.4: Derivation of planters' price, 2005-2013 (MUR per tonne sugar)

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Sugar	17,626	17,891	18,620	17,427	14,612	13,536	16,020	17,573	15,830
Alcohol							247	275	269
Bagasse - Category 1	75	74	89	82	79	66	62	62	63
Bagasse - Category 2	82	82	100	101	99	104	113	117	119
Molasses	469	570	409	655	906	808	595	671	591
Total revenue (Category 1)	**18,170**	**18,536**	**19,118**	**18,165**	**15,597**	**14,410**	**16,924**	**18,581**	**16,753**
Total revenue (Category 2)	**18,177**	**18,543**	**19,129**	**18,183**	**15,616**	**14,447**	**16,975**	**18,636**	**16,810**

4.4 NOS sugar

The industry also imports and refines non-originating sugars (NOS) and this represents another source by which the ex-Syndicate price can be enhanced. It also allows refiners to utilise their refineries more fully. This sugar can be sold in three main outlets for refined NOS:

- The domestic market, where it must compete with duty-free imports of white sugar.

- The EU, where rules of origin restrict NOS incorporation rates to 15% of sales value.

- The world market, including the COMESA market, where rules of origin provide for minimum 35% local value addition.

Mauritius cannot export NOS sugar to SADC unless the raw sugar originates from within the region.

We have estimated the profit from refining NOS sugar for sale in each of these markets.

- In the case of the EU, the margin will be determined by the extent of the EU market premium over the world market. However, as we expect this to be modest in the future, the EU is unlikely to offer a consistently attractive market for NOS sugar, except in periods when local prices happen to be high relative to world market values. However, unrestricted use of NOS is possible in sugar-containing products if these are manufactured in Mauritius for onwards sale to the EU.
- In the case of the local and world markets, the margins on refining NOS sugars will depend on the prevailing levels of the world white premium.
  - Under most circumstances, refining for re-export is likely to be unattractive.
  - However, refining for the local market would be more remunerative, because refiners would not incur the costs associated with re-exporting the sugar.

The results of our estimates are summarised in Tables 4.5 to 4.8.

- In Table 4.5, we have estimated the cost of importing and refining raw sugar from the world market in each of our three world price scenarios. The value added from NOS will be dependent on the profit offered by prices in each market above this cost.

Table 4.5: The cost of importing and refining NOS sugars

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
World raw sugar price	US$/tonne	331	441	551
4.05% premium on VHP sugar	US$/tonne	13	18	22
Freight and margins	US$/tonne	55	55	55
c.i.f. cost of raw sugar	**US$/tonne**	**399**	**514**	**628**
Exchange rate	MUR/US$	30	30	30
c.i.f. cost of raw sugar	**MUR/tonne**	**12,096**	**15,573**	**19,049**
Discharge, refining and local transport costs	MUR/tonne	3,417	3,418	3,418
Delivered cost of NOS refined sugar	**MUR/tonne**	**15,513**	**18,990**	**22,467**

- Table 4.6 illustrates the returns from sales to the EU based on the three market outcomes discussed earlier in this section.
- Table 4.7 and 4.8 present the returns from sales to the domestic and world markets in our average world price scenario, but at three different levels of the world white premium[3], around US$45, US$75 and US$105 per tonne. US$75 per tonne can be considered to be a "reasonable" average level of the white premium[4]. However, if, as is widely expected, the EU becomes a larger exporter of white sugar again once quotas are abolished, the premium could come under sustained pressure.

[3] The world white premium is defined as the difference between the No.5 white sugar futures price and the No.11 world raw sugar futures price.

[4] This reflects the premium of world white sugar prices over world raw sugar prices that is required to cover major global refiners' operating costs at a world oil price of US$70/barrel and, therefore, ensure they continue to operate and supply refined sugar to the world in the long run.

There is no duty on sugar imported into Mauritius. While our main calculation assumes *status quo*, at the bottom of Table 4.7 we have indicated profitability if a 10% import duty on refined sugar was applied, and the duty on raw sugar was left at 0%.

Table 4.6: Profit from refining NOS sugars for sale in the EU

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
EU white sugar price, delivered to customer	**€/tonne**	**460**	**500**	**520**
Costs at destination[1]	€/tonne	60	60	60
c.i.f. price	**€/tonne**	**400**	**440**	**460**
Exchange rate	MUR/€	40	40	40
c.i.f. price	**MUR/tonne**	**16,146**	**17,761**	**18,568**
Logistics	MUR/tonne	1,453	1,453	1,453
Ex-Port Louis price	**MUR/tonne**	**14,693**	**16,307**	**17,115**
Delivered cost of NOS refined sugar	MUR/tonne	15,513	18,990	22,467
Value added by NOS refining	**MUR/tonne**	**-820**	**-2,683**	**-5,352**

Notes:
1. Includes financing, ports costs, transport to the customer and commission to partners.
2. Includes the cost of storage and handling at the terminal, and freight to the EU.
3. Includes the refining fee paid to producers and the cost of bagging/lining containers before shipping

Table 4.7: Profit from refining NOS sugars for sale in the domestic market[5]

		Low	Average	High
World raw sugar price	cents/lb	20	20	20
World raw sugar price	US$/tonne	441	441	441
White premium	US$/tonne	46	76	106
World white sugar price	**US$/tonne**	**487**	**517**	**547**
Freight and margins	US$/tonne	80	80	80
0% Duty	US$/tonne	0	0	0
Landed cost of white sugar	**US$/tonne**	**567**	**597**	**627**
Exchange rate	MUR/US$	30	30	30
Landed cost of white sugar	**MUR/tonne**	**17,193**	**18,103**	**19,012**
Discharge and wholesalers margins	MUR/tonne	606	606	606
Wholesale price (excl. dockers' pension)	**MUR/tonne**	**17,799**	**18,709**	**19,618**
Delivered cost of NOS refined sugar	MUR/tonne	18,990	18,990	18,990
Value added by NOS refining	**MUR/tonne**	**-1,191**	**-282**	**628**
IMPACT OF 10% IMPORT DUTY				
Value of duty	US$/tonne	57	60	63
Landed cost of white sugar	**US$/tonne**	**624**	**657**	**690**
Landed cost of white sugar	**MUR/tonne**	**18,913**	**19,913**	**20,913**
Discharge and wholesalers margins	MUR/tonne	606	606	606
Wholesale price (excl. dockers' pension)	**MUR/tonne**	**19,519**	**20,519**	**21,519**
Delivered cost of NOS refined sugar	MUR/tonne	18,990	18,990	18,990
Value added by NOS refining	**MUR/tonne**	**528**	**1,529**	**2,529**

[5] All sales to the domestic market are required to pay a contribution of MUR 3,800 per tonne towards dockers' pensions. However, as this is a levy that both importers of refined sugar as well as domestic refiners have to pay, we have not included this in the table.

Table 4.8: Profit from refining NOS sugars for sale in the world market

		Low	Average	High
World raw sugar price	cents/lb	20	20	20
World raw sugar price	US$/tonne	441	441	441
White premium	US$/tonne	46	76	106
World white sugar price (f.o.b)	**US$/tonne**	**487**	**517**	**547**
Exchange rate	MUR/US$	30	30	30
World white sugar price (f.o.b)	**MUR/tonne**	**14,768**	**15,678**	**16,587**
Delivered cost of NOS refined sugar	MUR/tonne	18,990	18,990	18,990
Value added by NOS refining	**MUR/tonne**	**-4,222**	**-3,313**	**-2,403**

This analysis implies that re-exporting NOS sugar to the EU and world markets is unlikely to be profitable under normal circumstances. Meanwhile, the profit the industry could earn from importing raw sugar from the world market and refining it for the local market is likely to be modest if the local market remains unprotected. However, if the government were to impose a modest tariff on imports of, say 10%, then this activity could generate a significant contribution to industry revenues per tonne of sugar refined. Moreover, it would allow the industry to utilise its refining capacity more extensively in the face of declining cane supply and, potentially, also export market opportunities for refined sugar. However, the potential for his activity is limited to annual sales of around 30-40,000 tonnes to the domestic market.

4.5 Derivation of ex-Syndicate prices

In this section, we present our derivation of the ex-Syndicate prices from sales of white refined sugar (WRS), special sugar and brown sugar to the EU and regional markets. Given that sugar prices in all these markets are linked ultimately to the world sugar price, we determine ex-Syndicate price a three different levels of the world raw sugar price: 15, 20 and 25 cents/lb. This provides a range of outcomes that reflect the uncertainties and volatility surrounding the world market.

4.5.1 The EU market

Refined sugar

Our derivation of ex-Syndicate prices received from sales of refined sugar to the EU is presented in Table 4.9 for each of our world price scenarios. To obtain ex-Syndicate prices, we have taken our projected EU white sugar price post-2017 and netted the costs presented in the table. These include expenses incurred by MSS, such as marketing and administration, as well 4% cess, proceeds from which are used to fund institutions supporting the industry.

In our average world price scenario, we project an ex-Syndicate price of around MUR 12,800 per tonne for sales of refined sugar to the EU. If world prices remained at around 15 cents/lb, we estimate the ex-Syndicate price would only be around MUR 11,300 per tonne.

The impact of supporting EU prices at export parity

The projections in Table 4.9 assume that the price of sugar in the EU reflects the cost of the marginal supplier to the market plus a premium that generates a 10% profit (EBIT) margin. However, given the competitive environment that is likely to exist after quotas are removed, it is possible that margins will be narrower than this. We have therefore simulated the implication of the margin being squeezed to 5%. Table 4.10 derives the impact of this on ex-Syndicate prices. This reveals that, if EU prices reflected these lower returns, the ex-Syndicate prices could drop to between MUR 10,600-12,900 per tonne.

Table 4.9: Derivation of ex-Syndicate prices for refined sugar sales to the EU

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
EU white sugar price, delivered to customer	**€/tonne**	**460**	**500**	**520**
Costs at destination[1]	€/tonne	60	60	60
c.i.f. price	**€/tonne**	**400**	**440**	**460**
Exchange rate	MUR/€	40	40	40
c.i.f. price	**MUR/tonne**	**16,146**	**17,761**	**18,568**
Logistics[2]	MUR/tonne	1,453	1,453	1,453
Cost of value addition[3]	MUR/tonne	2,745	2,745	2,745
MSS costs	MUR/tonne	202	202	202
4% cess	MUR/tonne	452	514	545
Ex-Syndicate price	**MUR/tonne**	**11,294**	**12,847**	**13,623**

Notes: 1. Includes financing, ports costs, transport to the customer and commission to partners.
2. Includes the cost of storage and handling at the terminal, and freight to the EU.
3. Includes the refining fee paid to producers and the cost of bagging/lining containers before shipping

Table 4.10: Derivation of ex-Syndicate prices for refined sugar sales to the EU – if EU prices reflected a 5% EBIT margin

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
EU white sugar price, delivered to customer	**€/tonne**	**440**	**470**	**500**
Costs at destination[1]	€/tonne	57	58	58
c.i.f. price	**€/tonne**	**383**	**412**	**442**
Exchange rate	MUR/€	40	40	40
c.i.f. price	**MUR/tonne**	**15,444**	**16,642**	**17,841**
Logistics[2]	MUR/tonne	1,453	1,453	1,453
Cost of value addition[3]	MUR/tonne	2,745	2,745	2,745
MSS costs	MUR/tonne	202	202	202
4% cess	US$/tonne	425	471	517
Ex-Syndicate price	**US$/tonne**	**10,619**	**11,772**	**12,925**

Notes: 1. Includes financing, ports costs, transport to the customer and commission to partners.
2. Includes the cost of storage and handling at the terminal, and freight to the EU.
3. Includes the refining fee paid to producers and the cost of bagging/lining containers before shipping

Special sugars

We have derived ex-Syndicate prices of special sugar sales to the EU in Table 4.11, assuming that the c.i.f. premium of special sugars over WRS values averages 25%. The table shows that, in our average world price scenario, we expect an ex-Syndicate price of around MUR 16,400 per tonne for sales of special sugar to the EU. At a world price of 15 cents/lb, we estimate this ex-Syndicate price will fall to around MUR 14,700 per tonne.

The impact of increased competition in the special sugars market

The last few years have seen increased competition from producers in countries such as Colombia, Malawi and Swaziland that have begun to supply the special sugars market at lower prices than Mauritius. Although these sugars are of lower quality than those produced by Mauritius, they have nevertheless had a negative impact on the volume of Mauritius's sales of special sugars. We therefore consider a scenario where Mauritius has to accept a lower premium on special sugar sales in order to remain competitive with other suppliers.

This is done in Table 4.12, which derives the ex-Syndicate prices assuming the premium on special sugar sales over refined sugar drops to 10%. This would reduce the ex-Syndicate price to around MUR 14,100 per tonne in our average world price scenario.

Table 4.11: Derivation of ex-Syndicate prices for special sugar sales to the EU

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. price (25% premium to refined sugar price)	**€/tonne**	**500**	**550**	**575**
Exchange rate	MUR/€	40	40	40
c.i.f. price	**MUR/tonne**	**20,182**	**22,201**	**23,210**
Logistics[1]	MUR/tonne	2,221	2,221	2,221
Cost of value addition[2]	MUR/tonne	2,523	2,735	2,841
MSS costs	MUR/tonne	202	202	202
4% cess	MUR/tonne	586	656	690
Ex-Syndicate price	**MUR/tonne**	**14,651**	**16,388**	**17,256**

Notes: 1. Includes the cost of storage and handling at the terminal, and freight to the EU.
2. Includes the manufacturing fee paid to producers and the cost of bagging/lining containers before shipping.

Table 4.12: Derivation of ex-Syndicate prices for special sugar sales to the EU – assuming increased competition pushed down prices

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. price (10% premium to refined sugar price)	**€/tonne**	**440**	**484**	**506**
Exchange rate	MUR/€	40	40	40
c.i.f. price	**MUR/tonne**	**17,761**	**19,537**	**20,425**
Logistics[1]	MUR/tonne	2,221	2,221	2,221
Cost of value addition[2]	MUR/tonne	2,269	2,455	2,548
MSS costs	MUR/tonne	202	202	202
4% cess	MUR/tonne	503	564	594
Ex-Syndicate price	**MUR/tonne**	**12,567**	**14,095**	**14,859**

Notes: 1. Includes the cost of storage and handling at the terminal, and freight to the EU.
2. Includes the manufacturing fee paid to producers and the cost of bagging/lining containers before shipping.

4.5.2 The regional market

Brown sugar

For brown sugar sales, we have concentrated on the Kenyan market, which is the largest import market in the region and is also very attractive because wholesale prices have offered premium of more than US$200 per tonne over the cost of imports from COMESA in recent years. Furthermore, Mauritius has duty-free access to this market. However, the size of this market opportunity, the level of the premium and counterparty risk are all high.

In Table 4.13, we derive the ex-Syndicate price that can be expected on sales of brown sugar if prices continue to offer a US$200 per tonne premium over the cost of duty-free imports from COMESA, which we assume to be equivalent to the c.i.f. price needed for southern African producers to supply the regional market ahead of the EU and world markets.

In our average world price scenario, we expect an ex-Syndicate price of around MUR 17,800 per tonne for sales of brown sugar to Kenya. At a world price of 15 cents/lb, we estimate the ex-Syndicate price would be lower at around MUR 16,500 per tonne.

Table 4.13: Derivation of ex-Syndicate prices for brown sugar sales to Kenya

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. brown sugar price, regional market	**US$/tonne**	**520**	**570**	**690**
Kenya premium	US$/tonne	200	200	200
c.i.f. brown sugar price, Kenya	**US$/tonne**	**720**	**770**	**890**
Exchange rate	MUR/US$	30	30	30
c.i.f. brown sugar price, Kenya	**MUR/tonne**	**21,823**	**23,339**	**26,976**
Logistics[1]	MUR/tonne	1,737	1,737	1,737
Cost of value addition[2]	MUR/tonne	2,694	2,853	3,235
MSS costs	MUR/tonne	201	201	201
4% cess	MUR/tonne	661	713	839
Ex-Syndicate price	**MUR/tonne**	**16,530**	**17,834**	**20,964**

Notes: 1. Includes the cost of storage and handling at the terminal, and freight to Kenya.
2. Includes the manufacturing fee paid to producers and the cost of bagging/lining containers before shipping.

However, in recognition of the threat of regional exporters increasing sales to the region in response to lower prices in the EU post-2017, we have also considered what ex-Syndicate prices would be if the premium in Kenya was eroded and prices simply reflected the level at which southern African producers would be willing to supply the regional market (Table 4.14). The analysis shows that, in such a scenario, the ex-Syndicate prices would drop to around MUR 12,600 per tonne in our average world price scenario.

Table 4.14: Derivation of ex-Syndicate prices for brown sugar sales to Kenya – assuming prices were bid down to the cost of imports from southern Africa

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. brown sugar price, regional market	**US$/tonne**	**520**	**570**	**690**
Kenya premium	US$/tonne	0	0	0
c.i.f. brown sugar price, Kenya	**US$/tonne**	**520**	**570**	**690**
Exchange rate	MUR/US$	30	30	30
c.i.f. brown sugar price, Kenya	**MUR/tonne**	**15,761**	**17,277**	**20,914**
Logistics[1]	MUR/tonne	1,737	1,737	1,737
Cost of value addition[2]	MUR/tonne	2,057	2,216	2,598
MSS costs	MUR/tonne	201	201	201
4% cess	MUR/tonne	453	505	630
Ex-Syndicate price	**MUR/tonne**	**11,313**	**12,617**	**15,748**

Notes: 1. Includes the cost of storage and handling at the terminal, and freight to Kenya.
2. Includes the manufacturing fee paid to producers and the cost of bagging/lining containers before shipping.

Refined sugar

In the absence of refining capacity in key markets in COMESA and SADC, countries such as Kenya, Tanzania, Madagascar and others are reliant upon imports of refined sugar from outside the region. In the largest markets, Kenya and Tanzania, these sugars are subject to import duties of around 10%, and therefore offer Mauritius a margin of preference vis-à-vis world market suppliers.

In our average world price scenario, we expect refined sugar sales to the region to fetch an ex-Syndicate price of around MUR 15,000 per tonne (Table 4.15). If world prices traded at 15 cents/lb, we would expect the ex-Syndicate price to be as low as MUR 10,900 per tonne.

Table 4.15: Derivation of ex-Syndicate prices for refined sugar sales to the region

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. refined sugar price, regional market	**US$/tonne**	**530**	**670**	**800**
Exchange rate	MUR/US$	30	30	30
c.i.f. refined sugar price, regional market	**MUR/tonne**	**16,064**	**20,308**	**24,248**
Logistics[1]	MUR/tonne	1,737	1,737	1,737
Cost of value addition[2]	MUR/tonne	2,824	2,824	2,824
MSS costs	MUR/tonne	201	201	201
4% cess	MUR/tonne	435	598	749
Ex-Syndicate price	**MUR/tonne**	**10,867**	**14,947**	**18,736**

Notes: 1. Includes the cost of storage and handling at the terminal, and freight to the region.
2. Includes the refining fee paid to producers and the cost of bagging/lining containers before shipping.

In response to lower prices in the EU after 2017, there is a risk that other southern African producers could better utilize their refining capacities to supply more refined to the region. If prices fell to the level at which these producers we were willing to supply refined sugar to the region ahead of their brown and raw sugar markets, we estimate that the ex-Syndicate price would fall to MUR 12,900 per tonne in our average world price scenario (Table 4.16).

Table 4.16: Derivation of ex-Syndicate prices for refined sugar sales to the region – assuming prices were bid down to the cost of imports from southern Africa

		Low	Average	High
World raw sugar price	cents/lb	15	20	25
c.i.f. refined sugar price, regional market	**US$/tonne**	**550**	**600**	**720**
Exchange rate	MUR/US$	30	30	30
c.i.f. refined sugar price, regional market	**MUR/tonne**	**16,670**	**18,186**	**21,823**
Logistics[1]	MUR/tonne	1,737	1,737	1,737
Cost of value addition[2]	MUR/tonne	2,824	2,824	2,824
MSS costs	MUR/tonne	201	201	201
4% cess	MUR/tonne	458	516	656
Ex-Syndicate price	**MUR/tonne**	**11,450**	**12,907**	**16,405**

Notes: 1. Includes the cost of storage and handling at the terminal, and freight to the region.
2. Includes the refining fee paid to producers and the cost of bagging/lining containers before shipping.

Section 5: Business as Usual

The objective of this section is to evaluate the implications for the sector of maintaining the current *direction or travel*.

On marketing, MSS is finalising negotiations that will commit sales of all white refined sugar (plus some special sugars) to three companies in the EU. These commitments will replace the current Südzucker contract and will be effective for the 2015-2018 crops. These contracts will ensure industry's marketing strategy remains largely EU focused until 2018, although they do give the Mauritius the flexibility to sell some quantities of sugar outside the EU if prices are remunerative. They do, however, mean that the prices earned will depend on the evolution of the sugar market in the EU, which is uncertain but promises to be less remunerative than in the past.

In light of the uncertainty surrounding the industry's income, we establish below the EU sugar price the industry will have to earn from sales of WRS in the EU for it to cover its costs. This takes account of the premiums that it earns from sales of special sugars and planters' revenues from by-products (bagasse, molasses and potable alcohol). By determining this price, we are able to establish the magnitude of the challenge facing the industry and the scale of the measures that must be implemented to confront them.

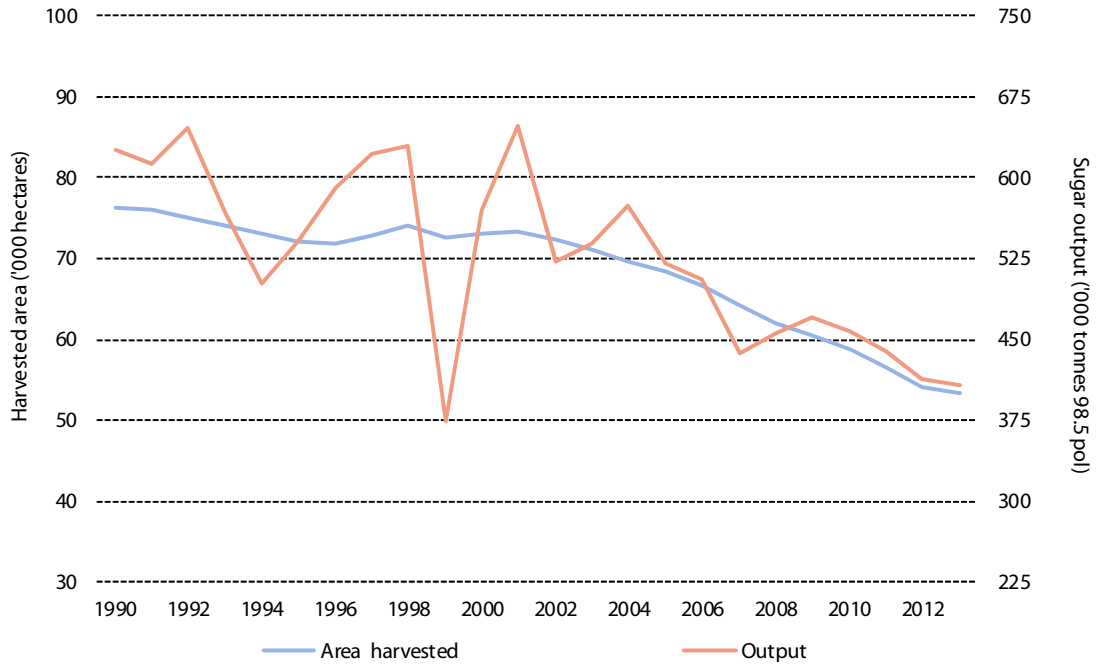
This section is arranged in four parts:

1. The first assesses the outlook for cane and sugar production.
2. We then evaluate the sector's current cost structure and its outlook.
3. Using this information, we determine the EU price of WRS that will be needed to ensure the industry breaks even during up to 2018 and beyond.
4. Finally, we consider environmental and social consequences of current trends in cane area and sugar prices.

5.1 Mauritius' sugar production potential

Cane area and sugar output have both been in decline since the early 1990s, and the rate of decline began to accelerate in the 2000s (Diagram 5.1). Today, the total sugar output of the island is less than that of some of the world's largest sugar factories.

Diagram 5.1: Harvested area and sugar output since 1990



Since 2006, an average of almost 2,000 hectares of cane land has gone out of cane production each year and sugar production has dropped to close to 400,000 tonnes. This represents an annual decline in area of 3.1%; over the preceding 15 years, the rate of decline was 0.8% per year.

The decline in area since 2006 has been much faster among planters (at 5-8% per year) than on corporate lands (less than 2% per annum). Within the planter community, data published by SFIB shows the fall in area has been broadly similar for all farm sizes (Diagram 5.2). Even when the loss of area is expressed in hectares, the difference between the two is stark: planter area dropped by over 7,000 hectares, while corporate/mills area contracted by 4,500 hectares (Diagram 5.3).

Diagram 5.2: Annual percentage decline in area by farm size, average 2006-2012

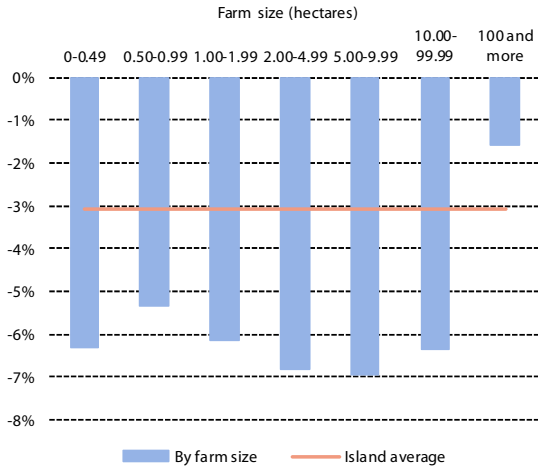
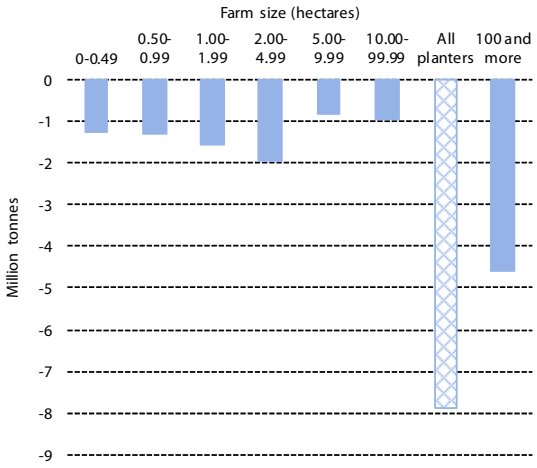


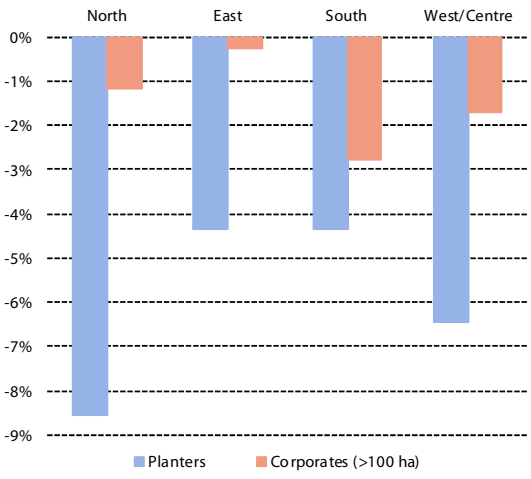
Diagram 5.3: Reduction in sugar production by farm size, 2006-2012



When viewed across different regions of the island, loss of cane land has been fastest in the North and Centre/West, where development of land for urban, commercial and tourist uses has been greatest. These different rates of loss are most apparent on planter land and are shown in Diagram 5.4, in which we aggregate all farms classified by SFIB as being less than 100 hectares.

When corporate farms are included, the East stands out as having witnessed the slowest loss of area. For this reason, the sole miller in the region, Alteo, is now best supplied with cane among the four milling companies.

Diagram 5.4: Annual percentage decline in area by region, average 2006-2012



5.1.1 The outlook for cane area and sugar production

If the trends witnessed since 2006 continue unabated, sugar output will fall to around 350,000 by 2020 and towards 300,000 tonnes by 2025. At this rate of decline, area under cane will be less than 40,000 hectares by the end of this period, just half its level in 2000. The likelihood of

this happening will depend on the future viability of cane farming and milling, which will come under considerable pressure in the run-up to the forthcoming reforms of the EU sugar regime in 2017.

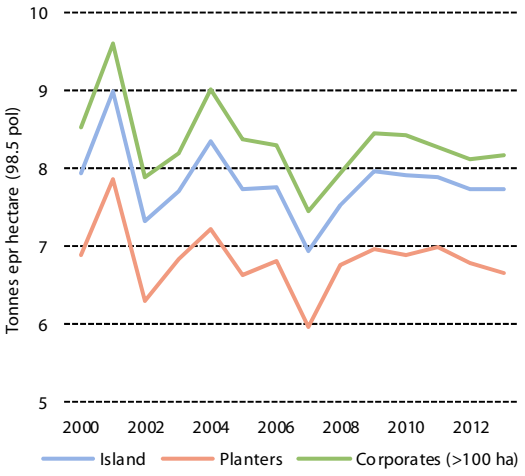
Although the industry has made huge strides in improving its cost competitiveness as a result of many initiatives — most recently those included in the MAAS — the sector continues to face falling sugar prices. At the same time, growers and millers have had to contend with (often rapidly) rising input prices. In particular, fast-rising wages, and reduced availability of agricultural labour, especially for harvesting, has required substantial investment in mechanisation of field operations. On most land, this requires considerable up-front expenditure on de-rocking.

However, the potential for cost reductions from mechanisation is limited largely to corporate and mill-owned farmers. For planters, the small-scale of plots means that it is difficult for mechanized harvester to operate efficiently. Although, as we discuss in Section 6, the FORIP attempts to address this through re-grouping of planters into block farms, additional hurdles are created by physical characteristics, such as rocky soils and the locations of these plots on sloping land. As a result, only around 4,000 hectares of small and mediums planters' land has been identified as suitable for full mechanisation[1] (around16% at the time of study). The rest was identified as either un-suitable for mechanisation or only suitable for part mechanisation (i.e., for operations such as fertiliser and herbicide application and cane loading). Importantly part mechanisation excludes cane harvesting, which is the most labour intensive of field operations and, therefore, has the greatest need for mechanisation.

Meanwhile, yields of sugar per hectare have been trending slowly downwards, thereby offering no offset against rising costs (Diagram 5.5). There are numerous factors that have influenced this trend, which cannot be attributable only to cane varieties and developments in cane breeding.

Over this period, a large amount of land has gone out of production, including some high-yielding areas in the Centre of the island. Meanwhile, adoption of mechanical harvesting, which has been driven by the need to cut costs and is now the dominant practice on corporate and mill-owned farms, leads of much greater harvest losses.

Diagram 5.5: Evolution sugar yields per hectare



With adoption of mechanical operations — from planting to harvesting — now widespread on suitable lands, it is possible that the modest downward trend that is apparent from Diagram 5.5 will cease and may even be reversed as underlying improvements in cane varieties and farming practices are no longer overwhelmed by the effect of increases in mechanisation. Indeed, the sector is still adapting to mechanisation and producers are adopting new methods of planting as well as GPS guidance systems for mechanical operations. These will allow producers to minimise harvest losses and lengthen the crop cycle.

[1] MSIRI – Occasional Report No. 35: "Derocking and Suitability for Mechanisation of Small/Medium-Planters' Cane Land", October 2008.

Nevertheless, when looking ahead, it is the future trajectory of cane area that will ultimately dictate the future level of cane area and sugar output. As we discuss below, there are arguments both for and against a slowing of the downward trend of the past10-15 years.

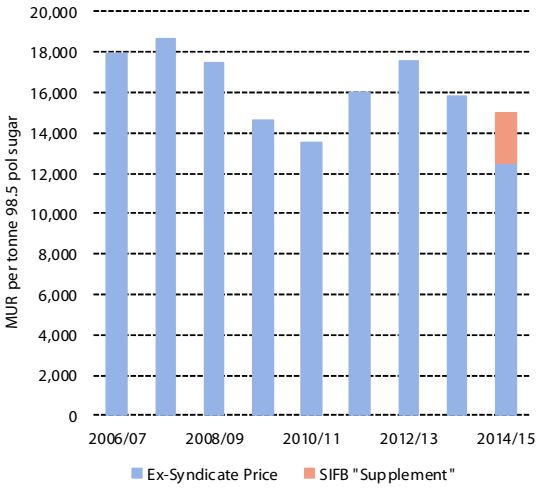
Arguments for

Perhaps the strongest argument for continued rapid contraction of the sector is the prospect of lower sugar prices. Reduction, and possibly even loss, of preference on sales to the EU post-2017 suggests that the sugar prices earned by the industry will be lower in the future.

Moreover, current poor market conditions in the EU — which reflect over-supply in the market and strategic positioning of companies in advance of the reforms — mean that substantially lower prices are imminent. On 26 September 2014, MSS estimated that the ex-Syndicate sugar price for the 2014 crop is likely to drop to just MUR12,500 per tonne.

Even allowing for the MUR 2,500 per tonne "supplement" that is expected as a result of a payments from the SFIB's accumulated surplus and a suspension of contributory premiums, the price will be low when compared to the past (Diagram 5.6).

Diagram 5.6: Evolution of the Ex-Syndicate sugar price



A total estimated receipt of MUR15,000 per tonne in 2014 compares with growers' and millers' current costs average around MUR 16,000 per tonne and suggests that an acceleration of the decline in area is possible. To provide some context to this, Diagrams 5.7 and 5.8 chart year-on-year changes in cane area against year-on-year changes in ex-Syndicate prices[2,3]. Diagram 5.7 uses area data for the island as a whole, whereas Diagram 5.8 focusses on planters' area only. We have not included a chart for corporate lands as these show no clear relationship with price.

[2] We have converted Ex-Syndicate prices from nominal to real values to allow for the influence of inflation over this period. In other words, a price of MUR16,000 per tonne in 2000 was worth more than the same price today. To adjust for this, we have used the consumer price index (CPI) as a guide for inflation over the period.

[3] Prices are lagged by two years to allow for a delay in the response of farmers to changes in prices. This data reveals a strong relationship when this time lag is assumed. Justification for it is likely to be that the price in a particular year will not be known with any certainty until the harvest is well advanced. This means the following year's ratoon crop will already be developing and farmers may therefore respond most strongly to price changes with a two-year lag.

Diagram 5.7: Annual change in island area vs. annual change in ex-Syndicate prices

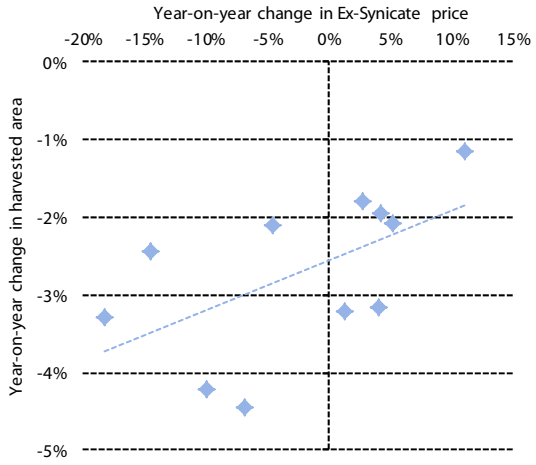
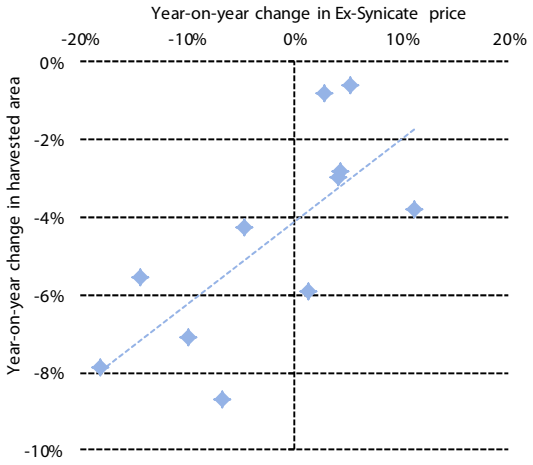


Diagram 5.8: Annual change in planter area vs. annual change in ex-Syndicate prices



The diagrams suggest that some area has dropped out of cane even in years when sugar prices have been unchanged or have increased slightly for reasons. This reflects the underlying loss of land that we mention earlier. However, it is apparent that loss of area has been greater in years following a decline in sugar prices. If these loose relationships hold in the future, then the reduction in prices in 2013 and 2014 point to a further reduction in area of 6% for the island as a whole and 12% for planters over the next two years.

Arguments against

As well as a decline in prices, the decline in area in recent years cane be attributed to many other factors. As we discuss in Section 2, this includes land abandonment by planters growing cane on small uneconomic plots, conversion to other agricultural and non-agricultural uses, as well as conversion of corporate land under VRS/Blueprint. While many of these influences persist today, there are reasons why they may weaken in the future.

- Some planters who abandoned land did not have a long-term commitment towards cane farming and many did not rely on cane as a significant income source. Many of these planters have now left the sector, which suggests that a greater proportion of remaining planters have stronger commitments cane farming. Indeed, of the ~15,000-16,000 hectares that continue to be farmed by planters, 12,000 hectares have signed up to FORIP (although only 10,000 hectares have been replanted so far) and 3,000 hectares are part of Fairtrade (although roughly half of this land is under FORIP). In other words, at least two-thirds of remaining planters have made a serious commitment to cane farming and can be expected to remain productive as long as cane farming remains remunerative.
  - Those that have entered FORIP will have benefitted from their land having been upgraded, which should allow them to operate with a greater level of efficiency in the future. These farmers, nevertheless, face considerable hurdles in the future, especially when it comes to finding resources to replant cane. This challenge will be especially great if the timing of their replanting coincides with low sugar prices. Furthermore, as we have discussed, most to these land are still unsuitable for mechanisation of harvesting operations and so is threatened by the fast-growing cost of labour.

  - Many planters that have joined Fairtrade have also benefitted from FORIP. In addition, as we will discuss in Section 6, they are obliged under the programme to adopt certain *best practices* and also benefit, directly or indirectly, from the Fairtrade premium.

- The amount of land that is likely still to be converted under VRS/Blueprint is now small.
- A total of 10 and 6 mills have closed since 2000 and 2006, respectively, and only four mills are now operational. This implies that loss of land associated with mill closures will be much less in the future than in the past.

Projecting the future

It is impossible to predict how cane area and sugar output will evolve and, for reasons we have discussed, there are arguments for and against the current downward trend continuing. However, it is nevertheless helpful to gauge the approximate future level of output, as this will have far-reaching implications for many aspects of the sector. These include the amount of sugar that will be available for sale and, therefore, the markets Mauritius can supply.

Diagrams 5.9 and 5.10 depict our forecasts of harvested cane area and sugar output, respectively, differentiating between planters, corporates/millers and the island as a whole. The main assumptions underpinning these projections include:

- Planter cane area continues to decline at the same rate as it has since 2006 but stops declining once it reaches 80% of the area that has applied for FORIP. We have made no additional allowance for Fairtrade land. This implicitly assumes that any Fairtrade land that is currently not under FORIP will be in the future.
- Corporate lands contract at half the rate since 2006, because there is now limited scope for further centralisation of mills.
- Cane yields are assumed to remain steady at their trend level, which implies approximately 75 tonnes per hectare, 80 tonnes per hectare and 65 tonnes per hectare for the island as a whole, for corporates and for planters, respectively.
- The industrial yield of 98.5° pol sugar per tonne of cane is also held constant at the average of the past 5 years (10.3%).

Diagram 5.9: Projected area under cane to 2025

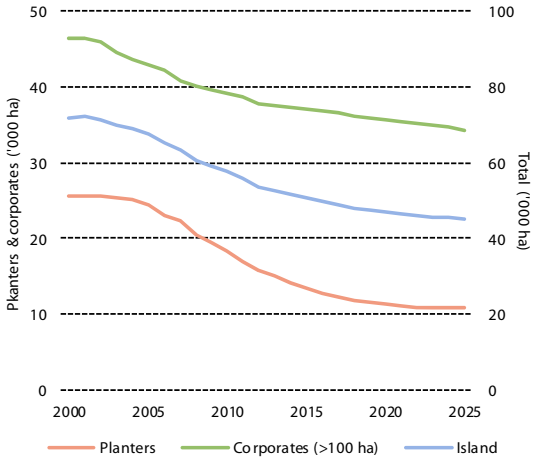
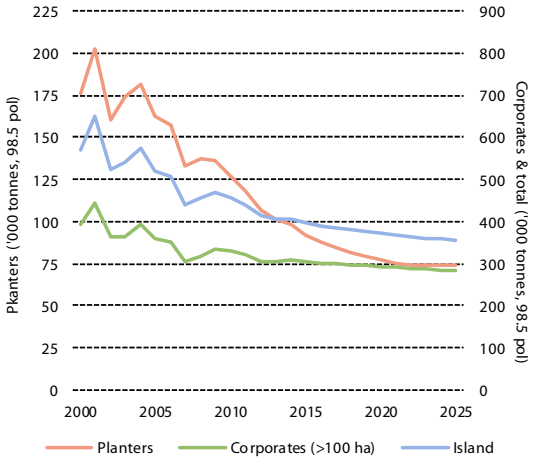


Diagram 5.10: Projected sugar production to 2025



The results of this simulation suggest that total island sugar output will soon drop below 400,000 tonnes and approach 350,000 tonnes within the next ten years, which will be grown on an area of approximately 45,000 hectares. The challenge for the sector is to ensure the contraction of the industry is not greater and that this moderated rate of decline vis-à-vis the recent past is achieved.

5.2 Planters' and millers' costs

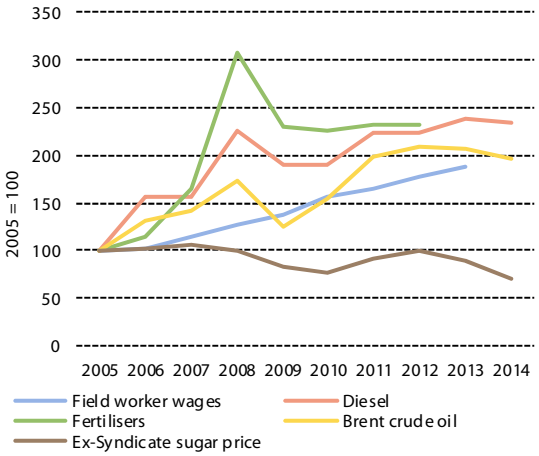
In 2010, the Mid-Term Review of the MAAS commissioned by Government by found the viability prices (which are defined to cover operating costs, depreciation and provide some return on capital employed) for the sector was MUR15,000 per tonne (basis the ex-Syndicate price). This price will be higher today owing to inflation in input prices and it is widely agreed that the figure is now around MUR16,000 per tonne.

In practice, there are large cost variations among planters and millers, reflecting the diversity of agro-climatic and soil conditions in which cane is grown, efficiency levels, scale of operations, debt levels, etc. Although this means that there are producers who can withstand lower prices, it is clear that none are viable in the long run at the price of MUR12,500 per tonne that the MSS envisages for the 2014 crop. Moreover, for the industry to retain a critical mass of cane supply that is necessary to sustain milling capacity and contain industry overhead costs, industry returns should cover not just the average viability price, but also those of some producers whose costs are above average. If not, then the risk of cane abandonment from these higher cost growers threatens to further reduce industry output and, therefore, push up millers' average costs of production.

Furthermore, there will be further upward pressure on costs unless the rising trend in input prices is arrested. While the prices of many key inputs in sugar production — diesel, fertiliser, chemical and machinery costs — are set in international markets, one key input — wages — embodies elements of costs that reflect institutional arrangements. As such, labour remuneration rates can be influenced within Mauritius.

Diagram 5.11 presents indices of key inputs since 2005 and contrasts these with the ex-Syndicate price and highlights the central challenge facing cane and sugar producers. We can see that, while the costs of key inputs have been increasing, the prices received have been trended downwards, resulting in a squeezing of industry profitability. If these trends continue, limited potential to raise productivity further points to very difficult times ahead for the industry.

Diagram 5.11: Indices of input prices and the ex-Syndicate sugar price

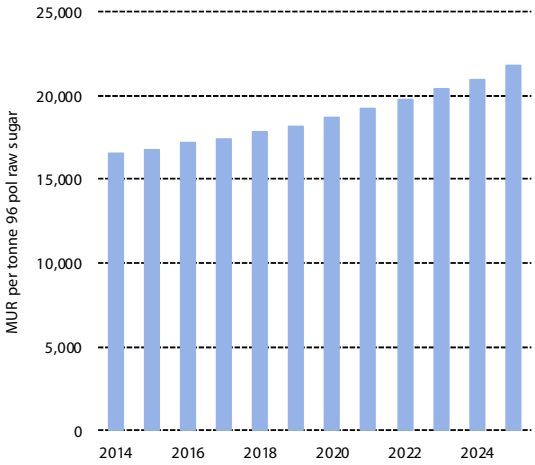


Given the extent to which the sector has already rationalised milling capacity, the greatest danger facing the industry is that cane supply falls below a threshold level at which milling is viable. Cane farming only has to become unviable for a section of planters — small planters and corporates — for this situation to arise.

We have simulated the impact of continued input price inflation on producers' costs in Diagram 5.12. For this analysis, we have adopted the following assumptions:

- The prices of all *traded goods*, namely diesel, fertilisers, chemicals and machinery, decline in the future by 2% per annum when expressed in rupees. This assumes stable/weaker world energy prices and a strong/strengthening rupee against the US dollar.
- Wages continue to rise at the same rate as over the past five years, at approximately 7% per year.
- Cane yields and sugar recovered per tonne of cane remain unchanged.

Diagram 5.12: Future evolution of costs assuming *business as usual*



- No further significant changes in production efficiency. In practice, there will be some ongoing changes in farming practices, especially in the corporate planter sector, where there are still some areas where cane planting and harvesting will be mechanised. We also assume that planting and harvesting on small-planter farmers remains manual.

The outlook for rising costs paints a striking and alarming picture, *even if the price of non-labour inputs decline by 2% per annum*. This outlook is especially worrying for small planters, for whom labour represents a substantial share of costs. This is because many of their farming activities, notably planting and harvesting, are still manual activities. Moreover, these growers cannot bulk buy inputs on the scale that commercial planters are able to. Given the rate at which area has been declining in this segment, this highlights the need to take whatever measures are possible to contain costs.

5.2.1 Ex-Syndicate prices to cover costs

In line with MSS's strategy of maximizing value through production development and diversification, an increasing quantity of sugar is being sold to non-EU destinations. However, for the next five crops, up to and including 2018, the industry will remain heavily influenced by developments in the EU, with the majority of special sugar sold in Europe and almost all WRS sold to partners in the EU. It is therefore important to consider the prices that will be needed in the EU in order to cover costs of production in Mauritius.

Special sugars have historically commanded a substantial premium over WRS prices, and, for 2014, have been sold at an average price of approximately €700 per tonne. However, the future evolution of the price of specials will depend on the level of WRS prices in the EU sugar and the premium that special sugars command over WRS. For reasons we discuss in detail in Section 4, the outlook is for weak WRS prices and for the special's premium to remain under pressure in the face of increased competition from other suppliers.

Assuming more modest sugar prices in the EU in the future — which is consistent with the analysis undertaken by the European commission as well as our own assessment — the value of special sugars will be lower in the future. Even if these sugars retain their 25% premium over WRS sugar, the future CIF value will be closer to €575/tonne and that value of

€700/tonne realised in 2014[4]. Using this lower value of €575, it is possible to derive the price of WRS in the EU that will result in a take-home price for producers in Mauritius that will allow them to match their costs of around MUR16,000. This calculation is presented in Table 5.1 for four different categories of producers: small planters, corporate planters, miller planters and millers.

The table reveals that, with the exception of small planters that earn a premium from Fairtrade, the price of WRS sugar in the EU that will cover the industry-average viability price is around €520-540 per tonne or more. This is very high when contrasted with the outlook for EU sugar price over the next few years (which we discuss in Section 4).

Table 5.1: Derivation of the EU price that provides producers with a break-even take-home sugar price of MUR16,000 per tonne

			Small Planters	Corporate Planters	Miller Planters	Millers
Viability price	MUR/tonne raw sugar	A	16,000	16,000	16,000	16,000
Special sugars						
- Volume	Tonnes	B	100,000	100,000	100,000	100,000
- Value	MUR/tonne raw sugar	C	17,123	17,123	17,123	17,123
WRS						
- Volume	Tonnes	D	310,000	310,000	310,000	310,000
- Value	MUR/tonne raw sugar	E=(A*[B+D]-[B*C])/D	15,638	15,638	15,638	15,638
Costs	MUR/tonne	F				
MSS costs	MUR/tonne		202	202	202	202
Cost of value addition[3]	MUR/tonne		2,745	2,745	2,745	2,745
Logistics[2]	MUR/tonne		1,453	1,453	1,453	1,453
Cess @ MUR16,000 x 4%	MUR/tonne		640	640	640	640
WRS CIF EU	MUR/tonne	G=E+F	20,678	20,678	20,678	20,678
WRS CIF EU	€/tonne	H=G/40	517	517	517	517
Costs at destination[1]	€/tonne	I	55	55	55	55
Gross viability price	€/tonne	J=H+I	572	572	572	572
Premium for value addition	€/tonne	K	30	30	30	30
Net viability price	€/tonne	L=J-K	542	542	542	542
By-product credits	€/tonne	M	101	25	22	0
Molasses	*€/tonne*		*15*	*15*	*15*	*0*
Bagasse	*€/tonne*		*3*	*3*	*0*	*0*
Alcohol	*€/tonne*		*7*	*7*	*7*	*0*
Fairtrade	*€/tonne*		*77*	*0*	*0*	*0*
Net viability price net of B-P	€/tonne	N=L-M	441	517	520	542

Notes:
1. Includes financing, ports costs, transport to the customer and commission to partners.
2. Includes the cost of storage and handling at the terminal, and freight to the EU.
3. Includes the refining and manufacturing fees paid to producers and the cost of bagging/lining containers before shipping

The derivation of viability price of WRS in the EU entails a complex set of calculations that are explained below.

[4] The value of €575/tonne is derived as follows. We have assumed an EU market price of €500 for WRS, which is based on LMC's analysis and summarised in Table 4.1 in Section 4. We have assumed specials command a premium of 25%, which leads to a price of €625, from which we have deducted €50 for the costs from CIF EU to delivered customer. (For comparison, the European Commission envisages ex-works prices of WRS of around €415-450 in the aftermath of the reforms. These prices are consistent with delivered market prices of around €465-500, assuming an average cost of €50 for delivery to customer. This is slightly lower than our assumptions.)

- The value of special sugars (B*C) is deducted from the ex-Syndicate viability price of MUR16,000 per tonne raw sugar (A) to convert this into a WRS-equivalent value (E).
- To this, we add the costs that are born by the industry and are associated with transforming, shipping and selling this sugar (F). This gives a CIF price of WRS, which we have converted from Rupees (G) into Euros (H) at a rate of MUR40/€.
- To reach the end-users, the industry incurs distribution and financing costs and commission that amount to approximately €60 per tonne (I) and give a gross viability price of just under €570 per tonne, delivered customer (J).
- Under the MSS's new contracts, its partners envisage generating premiums over the standard WRS price, which we have taken to be €30/tonne (K). This results in a net viability price of €540 per tonne (L).
- From this, we have deducted the value of by-products earned by planters, which differ according their status (M). In the case of small planters, we have included a Fairtrade premium, but, in practice, this is earned only by small planters that are members of the Fairtrade scheme. Today, 22,000 tonnes are sold as Fairtrade. This is expected to rise by 8,000 tonnes in 2015 and MSS anticipated volumes could reach 40,000 tonnes by 2019.

5.3Environmental issues

As discussed in Section 2, there are some environmental issues that have either emerged or grown in significance during the implementation of MAAS, and which may require a renewed focus and potentially additional mitigation that is not already foreseen in the strategy. On the other hand, new initiatives such as FORIP and Fairtrade have created opportunities for positive impact. These issues, and their potential significance if left unaddressed, are described in the following sections. Meanwhile Table 5.3 provides a summary.

5.4 Conversion and abandonment of cane land

We have already discussed the issue of loss of cane land to abandonment and other uses. As well as reducing industry output and revenues, this trend can also cause a number of environmental problems, which we discuss below.

Background

An SIFB survey of data from 2001 to 2010 identified that approximately 15,000 ha of land had moved out of sugarcane cultivation over the period (Table 5.2*)*. The majority of this land (60%) was abandoned; the reasons for which were manifold, ranging from a poor rate of return, to age, health and succession issues. By 2012, data shows that a further 4,000 hectares were lost.

Table 5.2: Island-wide change in land-use from sugarcane 2001-2010 (SIFB, 2011)

Land-use change	Number of plots	% Number of plots	Plot extent [ha]	% Change in extent
Foodstuff	7,140	32%	3,363	23%
Grass, Weed & Bushes	12,502	55%	9,026	61%
Built-up & Zoning	2,926	13%	2,509	17%
ISLAND	**22,568**	**100%**	**14,898**	**100%**

There is no distinct geographical pattern in the incidence of land conversion and abandonment, as demonstrated by Diagram 5.13. However, there is a slightly higher concentration of land abandonment in the south, and particularly in the hilly and mountainous terrain of the south-west, where a large proportion of the island's most difficult cane production areas are located.

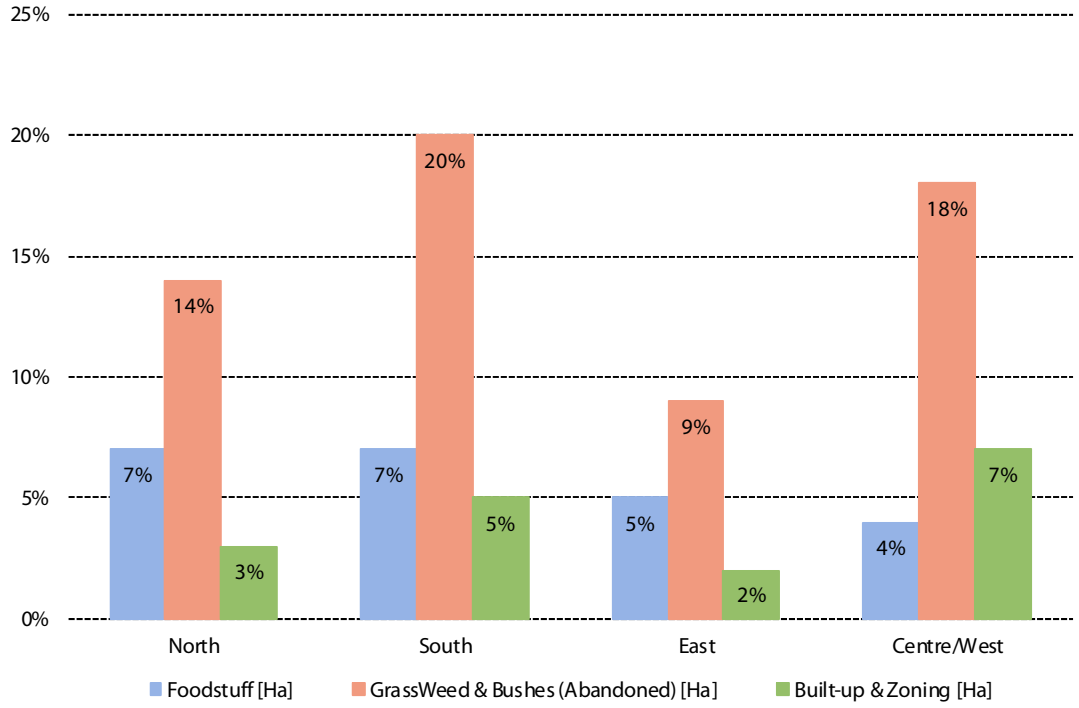
Table 5.3: Summary of environmental issues

Trends/issues	Cause of impact	Negative impacts	Positive impacts
Conversion and abandonment of cane land	Agricultural sub-division and fragmented urbanisation caused by lack of coordination between the sugarcane industry and other agencies around the management of land that is falling out of cane.	Urban sprawl - aesthetic impacts, loss of ecosystem services, landscape and biodiversity impacts. Emergence of disused and waste-strewn plots of land. Enhanced incidence of wild-fire.	
	Insufficient extension services for agricultural diversification	Soil erosion and flooding where geographical conditions present a risk. Risk of enhanced nutrient and agrochemical runoff into the island's lagoons and reservoirs from cultivation of crops such as vegetables.	
	Reduced supply of bagasse to power plants.	Greater reliance on fossil fuels to meet Mauritius's energy needs.	
Management of 'difficult' areas	Little or no progress made under MAAS with the difficult area measures, and lack of coordination between sugarcane industry and other agencies over land management as described above.	Increasing incidence of hillside erosion and associated sediment runoff and flooding reported in parts of the south-west coast. Risk of enhanced nutrient runoff and eutrophication (e.g. in coastal lagoons) where agricultural diversification is unmanaged.	
Uncontrolled cane burning	Divergence from industry code of practice.	Adverse impact on air quality and associated nuisance and health effects. Indirect environmental impacts from the loss of cane trash for mulching and weed control etc.	

Table 5.3 *(continued)*: Summary of environmental issues

FORIP	Dissemination of environmental best practices for fertiliser and pesticide use, establishment of vegetative buffers etc.		Positive impact on soil conservation and water quality conditions wherever implemented.
	Environmental measures not always fully implemented (focus on core production targets) and lack of formal reporting on progress with implementation.	Full realisation of potential positive impacts undermined.	
Fairtrade	Dissemination and rigorous enforcement of environmental safeguards and standards required for certification.		Improved pest management, soil and water conservation, waste management, biodiversity conservation, use of GMOs and reduced energy and greenhouse gas (GHG) emissions.
Water conservation and management	Implementation of policies and actions detailed in *Master Plan for the Development of Water Resources in Mauritius (2025-2050)*		Provision of a roadmap for the integration and management of water resources on the island, including the mobilisation of additional water of 225 Mm^3 per year. Proposals for new system of water rights with differential pricing to maximise resource efficiency and equitability that will incentivize a move towards more resource efficient drip-fed irrigation systems.

Diagram 5.13: Change in extent of land-use 2001-10 by region (SIFB, 2011)



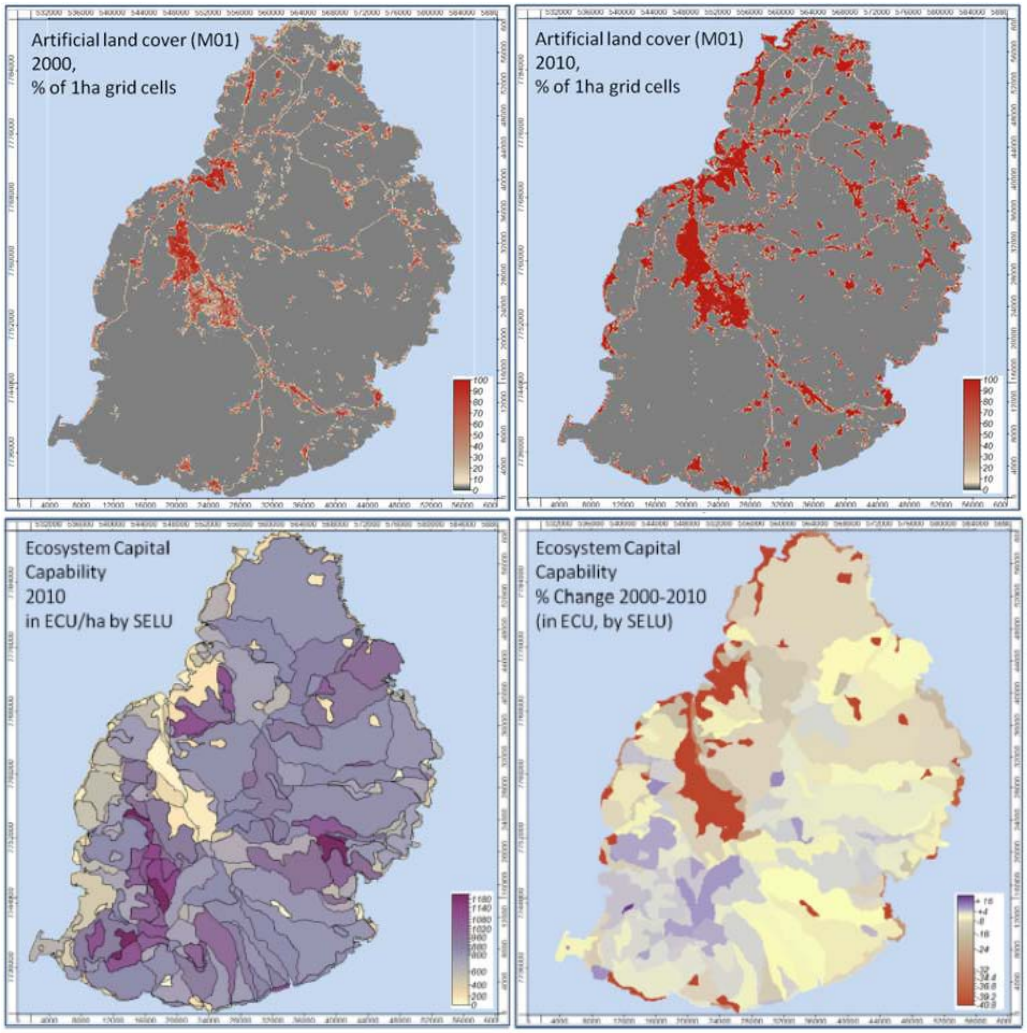
As described in Section 2, MAAS had originally planned to provide extension services and support for agricultural diversification on approximately 5,000 hectares of land within 'difficult areas' that would (it was projected) fall out of cane production, or to coordinate this support with other agencies where other economic activities were foreseen. However, the sheer extent of land conversion and abandonment that has actually occurred has largely overwhelmed this intention, and consequently efforts to date under MAAS have focussed on providing support to the most vulnerable planters (Metayers), and regrouping and maintaining cane production to the maximum extent possible under FORIP. As a result, the process of cane land conversion and abandonment has been largely uncoordinated, and has led to a number of environmental problems and issues.

Environmental impact

Probably the most significant environmental problem that has occurred has been the contribution of cane land conversion to general **urban sprawl** across Mauritius, and the associated aesthetic impacts for the tourism industry and loss of ecosystem services benefits that relate *inter alia* to reductions in bio-carbon stocks (from biomass and soil function) as well as landscape and biodiversity impacts (Diagram 5.14).[5]

[5] The ecosystem services accounting methodology used and its various limitations and approximations are discussed in detail by the author in the paper.

Diagram 5.14: Estimated urban sprawl and ecosystem capital in Mauritius, 2000-2010 (Indian Ocean Commission, 2013)



Source: Presentation of IOC-funded 2013 Mauritian pilot study on experimental ecosystem natural capital accounts, J L Weber, Ninth Meeting of the UN Committee of Experts on Environmental-Economic Accounting, New York, 25-27 June 2013.

The mechanisms for this effect are complex, and undoubtedly are linked to cases of agricultural sub-division by companies and individuals often for the purposes of financial speculation. However, there is also an element of incremental and fragmented urbanisation caused by the construction of private housing on small plots of former cane land that (under Mauritian planning laws) does not require planning consent if socio-economic need can be demonstrated.

In addition to contributing to urban sprawl, a number of other issues related to the abandonment of cane land need to be highlighted:

- It has also, anecdotally, led to a prevalence of disused and waste-strewn plots of land on the outskirts of some towns and villages, and an enhanced incidence of wild-fire in some of the drier parts of the island.
- Moreover, although studies have not been carried out to confirm this, the agricultural diversification that has occurred to date has reportedly taken place without the support of any agricultural extension services and may (particularly in the case of vegetables) be

contributing to enhanced **soil erosion** and **flooding** where geographical conditions present a risk (e.g. in some of the more mountainous and hilly terrain, e.g. in the south-west) and potentially also to nutrient runoff to lagoons and reservoirs.

- Finally, another significant secondary impact from the loss of productive cane land is the consequent loss of bagasse as a fuel source for the co-generation plants. Estimates are that the annual supply of bagasse from 10,000 hectares of sugarcane (i.e. the potential land loss in the next 5-10 years at current rates of abandonment) equates to a reduction in coal consumption of approximately 50,000 tonnes (or 20,000 tonnes of heavy fuel oil). This represents a significant proportion of the sugar industry's current contribution to renewable energy supply in Mauritius. In other words, continued cane abandonment would result in **greater reliance on fossil fuels** to meet Mauritius's energy needs.

5.4.1 Managing 'difficult' areas

In this context, the term 'difficult areas' applies to lands that are currently under sugarcane but where future production is likely to be unsustainable due to practical issues such as difficult terrain and/or problems with accessibility, or particular environmental or socio-economic sensitivities. In very broad terms, this applies in particular to parts of the south-west and south-east of the island where the hilly and rocky coastal terrain renders sugarcane cultivation particularly difficult, but also to some steeply sloping hillsides in the mountainous areas of the interior.

Estimates of the total extent of difficult areas vary according to the classification system used. The original MAAS classification was based largely on the practicalities (and associated costs) of land preparation and harvesting, including de-rocking and mechanisation, and estimated that some 5,000 hectares of land fell into the category of difficult areas. However, research carried out by MSIRI in 2005/06, which was based upon an environmental and socio-economic risk based approach, estimated that some 12,400 hectares of (then) cultivated land fell into this category.

As discussed in Section 2, it was envisaged that MAAS would provide support to small planters situated in 'difficult areas' to continue with sugarcane production where this was economically feasible, or failing this to diversify into other crops (fruit, vegetable, biomass etc) or forestry, or to develop the land for ecotourism or Integrated Resort Scheme (IRS) type developments where this was appropriate. Support for cane planters would be delivered via the FORIP scheme, and more specifically the MSIA's Extension and Training Unit (FSA); support for other crops or activities would be provided by other relevant agencies, e.g. for agricultural diversification by the Ministry of Agriculture's Agricultural Research and Extension Unit (AREU). Existing Mauritian planning regulations and environmental permitting processes would apply to any change of land-use.

To date, little or no progress has been made under MAAS with the difficult area measures, and there is little coordination between the sugarcane industry and other agencies about the management of land that is falling out of cane. This lack of progress can be related directly to the discussion in the previous section concerning the very high rate of land conversion and abandonment that has actually occurred across the island since 2006, and the consequent need to focus limited FORIP resources on maintaining cane production first and foremost in the most economically viable areas.

As a consequence, the land abandonment that has occurred in difficult areas remains largely unmanaged and, although unquantified, environmental impacts will have occurred. In addition to the aesthetic impact in these generally scenic areas, these may include:

- The increasing incidence of **hillside erosion** and associated **sediment runoff and flooding** that has been reported in parts of the south-west coast where cane farming has ceased.

- Moreover, if smallholder agricultural diversion into more agro-chemically-intensive crops in these areas (such as vegetables) remains unsupported by extension and advisory services, as is the case at present, then there is a risk of **enhanced nutrient and agrochemical runoff into the island's lagoons and reservoirs**, with consequences for both tourism and water supply. The problem of eutrophication in the island's reservoirs is already under investigation by a Surveilliance Committee set up by the Ministry of Energy and Public Utilities.

Finally, although the Mauritian planning and environmental permitting processes are these days fairly robust in their regulation of commercial and built development in marginal areas such as these, there is a risk that unless the individual developments are addressed in a strategic and coordinated approach between the sugar industry and planning authorities, then the cumulative impacts over time will be very significant.

5.4.2 Uncontrolled cane burning

The air quality and nuisance impacts from cane burning prior to harvest are well known in Mauritius, and are coupled with the indirect environmental impacts from the loss of cane trash for mulching and weed control etc.

Although widespread until the late 1990s, the issue of controlled burning by the corporate sector has been progressively addressed since the introduction of a voluntary code of practice by the industry in 2001. This was further addressed in 2008 by its introduction by Government and the EU as a Key Performance Indicator for MAAS implementation, with a target to reduce the extent of burning of the annual crop (from 22% in 2008) by 0.5% in 2009, 0.75% in 2010 and 1% in 2011. The reductions actually achieved in the first three years (for which data are available) were 2.4% in 2009, 5.1% in 2010 and 4.5% in 2011, i.e. well above target. Assuming that efforts to implement the code of practice continue to be successful then it should be feasible to reduce the impacts from controlled burning to a minimal amount in future years.

However, the issue of uncontrolled cane burning that does not adhere to the industry code of practice remains a significant and increasing problem for the island (Table 5.4). This includes both the intentional (illegal) burning of fields, as well as the consequent spread of these fires to surrounding areas (as occurred in 2013, when Terra lost some 900 hectares of its crop to such an incident).

Table 5.4: Extent of accidental/illegal cane burning in Mauritius

Year	Small Planters (ha)	Sugar estates (ha)	Total Extent (ha)
2007	703	1,099	1,802
2008	587	953	1,540
2009	1,136	913	2,049
2010	1,262	1,150	2,412
2011	1,057	1,032	2,089
2012	729	1,274	2,003
2013	1,521	2,523	4,044
2014	591	1,533	2,124
Average	**948**	**1,310**	**2,258**

Source: MCIA, September 2014.

5.4.3 Small planter agri-environment best practices

It was recognised that re-grouping small farmers and mechanising the planting and harvesting processes under FORIP would enable the widespread dissemination of environmental best practices. The measures adopted for the scheme are described in Box 5.1.

Box 5.1: Agri-environment best practices under FORIP

All planters (large and small) that are supported through the MAAS should agree the following:

In relation to fertiliser use:

- To strictly follow MSIRI advice on the use of fertilizers, on soil management practices and on sustainable agricultural practices. All supported planters (large and small) should keep records of fertilizers used for inspection.
- To adopt minimum tillage (where the land has already been completely prepared for mechanisation) or to establish "frameworks of vegetative buffers" (on those sugarcane lands where minimum tillage cannot be practised).
- To stop farming within the buffer zones of rivers and streams (minimum of 15 metres from the river/stream bank). All projects on regrouping and mechanisation should establish minimal vegetative buffers along amelioration channels (e.g. 2 metres on each side of the channel bank) in the sugarcane fields. Such an approach is already taken in the first regrouping projects and it should become a standard practice.
- Irrigated lands with slopes over 3% should be accompanied by a targeted planting of protective vegetative buffers (e.g. vetiver) on borders of irrigated lands.

In relation to pesticide use:

- To adopt an overall approach of weed management (i.e. accepting certain level of weed infestation which is harmless to the crop) and to gradually lower application of pesticides to a maximum levels recommended by MSIRI.

In relation to erosion control (particularly for regrouping and mechanisation projects):

- Sugarcane farming is stopped within the riparian zone along rivers and streams (minimum of 15 metres from the river/stream bank) and that such riparian zone is converted to semi-natural state.
- Minimal vegetative buffers are established along amelioration channels (e.g. 2 metres on each side of the channel bank) in the sugarcane fields.

The introduction of these practices across (to date) some 10,000 hectares of land under FORIP will undoubtedly have had a positive impact on soil conservation and water quality conditions on the island. However, there is no formal reporting of progress with the measures and their implementation is understood to be a little patchy (e.g. the riparian buffer zones are rarely practised or enforced). The reasons for this most likely relate to general budget and resource constraints, and hence a focus on core production targets.

A similar set of environmental best practices measures have also been promulgated amongst some 5,000 small sugarcane farmers under the Fairtrade initiative in the last few years. These are summarised in Box 5.2, and their implementation is likely to have been fairly well observed owing to the fairly rigorous auditing and reporting processes required under Fairtrade.

Box 5.2: Scope of Fairtrade Environmental Standards

- Environmental management (responsible staff)
- Pest management:
  - use of integrated pest management
  - choice of pesticides
  - chemical use, handling and storage
- Soil and water conservation:
  - erosion control
  - fertiliser storage and use
  - soil fertility management
  - sustainable water sources and use
- Waste management
- Biodiversity conservation
- Use of GMOs
- Energy and greenhouse gas (GHG) emissions

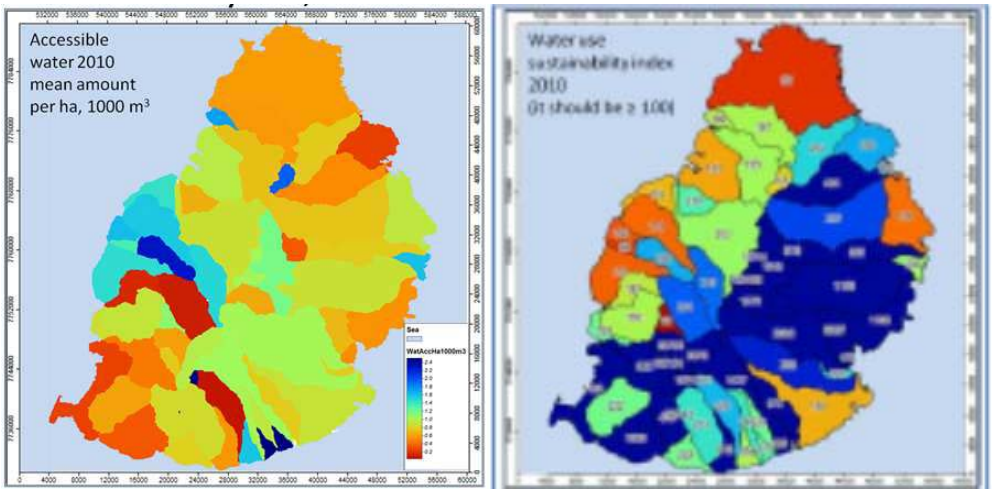
In summary, although the impacts cannot be quantified the measures taken within the industry to improve the environmental performance of field operations will undoubtedly have improved conditions since FORIP was initiated in 2006. Moreover, since these measures are also linked to the two initiatives that, in many respects, represent the future of cane growing on the island, i.e. FORIP and Fairtrade, then it is likely that these improvements will further continue.

5.4.4 Water conservation and management

Water supplies in Mauritius are relatively unconstrained in overall resource terms owing to the abundance of rainfall on the island. However, this rainfall is highly seasonal, and owing to the mountainous topography of the island a significant investment is required in reservoir storage in order to develop enough supply to meet demand. Moreover, the supply is unevenly distributed across the island, with prevailing weather patterns producing much drier conditions in the north and west of the island.

As a result, there have been emerging issues with water supply deficits in some of these drier areas where irrigation supplies are starting to compete with other municipal and industry demands for a limited resource, particularly where this is drawn from surface water (Diagram 5.15).

Diagram 5.15: Assessment of water accessibility and stress in Mauritius (Indian Ocean Commission, 2013)



Source: Presentation of IOC-funded 2013 Mauritian pilot study on experimental ecosystem natural capital accounts, J L Weber, Ninth Meeting of the UN Committee of Experts on Environmental-Economic Accounting, New York, 25-27 June 2013.

In response to these emerging issues, a *Master Plan for the Development of Water Resources in Mauritius (2025-2050)* was finalised in March 2013 that provides a roadmap for the integration and management of water resources on the island with goals set for the time horizons of 2025 and 2050. These include the mobilisation of additional water resources (totalling some 225 Mm^3 per year) through a combination of developing some fifty new sources, rehabilitating existing dams and water infrastructure, utilising treated wastewater for irrigation purposes (saving approximately 8 Mm^3 of freshwater per year), carrying out public water conservation campaigns and reducing non-revenue water (i.e. system losses, currently estimated at 45-50% of throughput [6]) in water supply systems.

The Master Plan also reviewed the existing legal framework for the water sector and proposes a water rights reform programme that would aim to eventually replace the largely unlimited rights allocated to landowners under the 1863 Rivers and Canals Act with a more rational water permitting system. The new system would aim to apply differential water pricing based upon factors such as volume, geographical water scarcity, end-use and seasonality of abstractions in order to maximise resource efficiency and equitability. The first phase of the programme is the implementation of an island-wide census of water rights by the Ministry of Energy and Public Utilities, which is currently ongoing.

The potential consequence for the sugar industry is that bulk irrigation water purchase agreements (for both corporate and small planters) may be affected, particularly in some of the drier and deficit-prone areas. As a result the relative economies of different irrigation systems would change, i.e. the pricing mechanism would likely favour a move towards more resource efficient drip-fed irrigation systems.

[6] CWA Annual Report, 2012.

5.5 Social issues

A summary of the key social issues arising from current trends and practices is provided in Table 5.5. We discuss these in more detail below.

5.5.1 Cane land abandonment

Consultation with small farmers, the MCIA, MSS and Farmer Cooperatives, all confirmed that land was still being abandoned at a consistent rate and that the reasons highlighted earlier were all reported to be valid. Primary constraints still cited by these groups therefore included:

- Not being able to make cane production economically viable on small plots of land due to rising costs and reduced returns.
- Succession issues meaning land was left unworked until amicable agreements for the future of the land could be agreed.
- Splitting of plots for inheritance purposes, leading to fragmentation and smaller plot sizes every generation.
- However, even if succession and inheritance issues could be resolved, the land could still be in danger of being abandoned due to the younger generation reportedly having little interest in cultivating cane and increasingly seeking work and careers elsewhere.

Abandonment of land carries with it a number of social issues, which we summarize below:

- From a socio-economic perspective, the loss of cane producing lands jeopardises the future of the industry in Mauritius which needs a certain level of feedstock to remain viable. Loss of the cane industry would bring serious **economic and cultural changes** to a country whose history has been steeped in cane production for hundreds of years.
- Land abandonment also leads to **loss of livelihoods** for the older, small farmers who find it hard to retrain and seek work in other industry sectors and are therefore vulnerable to falling into poverty. Pension payments for those small farmers who have officially retired were reportedly not sufficient by stakeholders interviewed (the state pension is around MUR3,000 per month) leaving those no longer physically or financially able to work their land, and therefore resorting to paying contract labourers to work, becoming vulnerable to falling into poverty due to ever increasing costs of production. Small farmers abandoning land have few alternative livelihood options and their age (most small farmers are nearing or have reached retirement age) and skill set makes entering new industry sectors challenging. This continuing trend of land abandonment therefore carries the risk of impoverishment of an entire section of the population previously involved in this industry.
- It also has wider impacts on industries such as **tourism** where the cane industry provides a lush and beautiful landscape and a history of interest to tourists.

The key challenge going forward, therefore, is how to sustain livelihoods for small cane farmers to ensure that they do not continue the trend of land abandonment and to encourage the younger generation to join the industry by transforming it into a modern, innovative, cutting edge industry with real business opportunities.

Where farmers have no other options but to abandon the land, there must be adequate welfare schemes and alternative livelihood options to ensure they do not fall into poverty.

Table 5.5: Summary of social issues

Trends/issues	Cause of impact	Impacts
Cane abandonment	Economic viability of cane cultivation and succession and inheritance issues.	Economic and cultural changes. Loss of livelihoods for older and small farmers.
Small planter livelihoods	Increasing cost of contracted labour combined with an ageing agricultural population.	Reduction in profitability of small holder cane production.
	Industry labour laws and collective bargaining reduce flexibility to manage labour costs.	Disproportionate impact on small planters' labour cost.
	Lack of access to credit.	Discouragement of farmers from re-planting fields.
	Lack of economies of scale.	Threatens economic viability of small planters.
	FORIP does not provide funds for re-planting cane.	Without other support measure, it is economically unviable for farmers to re-pant fields.
	Under FORIP farmers merge their Sugar Insurance Fund particulars into a single larger entity.	This means farmers do not fulfil the Fairtrade small producer eligibility criterion of having less than 10 hectares under cane cultivation.
	Currently the Fairtrade cost of accreditation MUR 325,000 is paid by the government.	Brings into question of sustainability of Fairtrade scheme.
Retirement and re-training schemes	Existing measures not used to secure future livelihoods, protect those not immediately reemployed by the industry, or to offer sufficient training to enable entry into new careers.	Large group of former workers are vulnerable to falling into poverty.
	Lack of focus on attracting new labour or re-training existing labour to undertake a broader range of tasks.	Shortage of skilled labour.
	Historic factors mean that workers leaving the cane industry due to restructuring are not eligible to access government welfare and empowerment schemes in the same way as other groups of workers.	Cane industry workers are not entitled to the same benefits of those in other industries.

5.5.2 Cane land abandonment

Consultation with small farmers, the MCIA, MSS and Farmer Cooperatives, all confirmed that land was still being abandoned at a consistent rate and that the reasons highlighted earlier were all reported to be valid. Primary constraints still cited by these groups therefore included:

- Not being able to make cane production economically viable on small plots of land due to rising costs and reduced returns.
- Succession issues meaning land was left unworked until amicable agreements for the future of the land could be agreed.
- Splitting of plots for inheritance purposes, leading to fragmentation and smaller plot sizes every generation.
- The younger generation reportedly having little interest in cultivating cane and increasingly seeking work and careers elsewhere.

Abandonment of land carries with it a number of social issues, which we summarize below:

- From a socio-economic perspective, the loss of cane producing land jeopardises the future of the industry in Mauritius which needs a certain level of feedstock to remain viable. Loss of the cane industry would bring serious **economic and cultural changes** to a country whose history and development has been steeped in cane production for hundreds of years.
- Land abandonment also leads to **loss of livelihoods**. Small farmers abandoning land have few alternative livelihood options and their age (most small farmers are nearing or have reached retirement age) and skill set makes entering new industry sectors challenging. This continuing trend of land abandonment therefore carries the risk of impoverishment of an entire section of the population previously involved in this industry. Farmers who are no longer physically or financially able to work their land and therefore resorting to paying contract labourers to do the work instead, becoming vulnerable to falling into poverty due to ever increasing costs of production.
- It also has wider impacts on industries such as **tourism** where the cane industry provides an attractive landscape and a history of interest to tourists.

The key challenge going forward, therefore, is how to improve the economic viability of cane production on small plots to sustain farmer livelihoods and to encourage the younger generation to join the industry by transforming it into a modern, innovative, industry with real business opportunities. In addition, where farmers have no other option but to abandon their land, there must be adequate welfare schemes and assistance with obtaining alternative employment, to ensure they do not fall into poverty.

5.5.3 Small planter livelihoods

Currently, the challenges facing small farmers, such as high costs of production (transport, inputs, labour etc) as well as social and cultural issues (e.g. inheritance issues) will likely lead to increased land abandonment unless the economic viability of planting is improved.

Some mechanisms such as the Cooperatives and Fairtrade scheme are able to take advantage of economies of scale and reduce input costs; but this does not address the labour issues, whereby farmers are dependent on expensive contract labour to work their land.

The high cost of labour is severely impacting small farmer's economic viability in the face of a lower sugar price. The increased cost of contract labour, coupled with an aging farmer population who increasingly relies on it, is unsustainable in the longer term. With the introduction of free tertiary education in Mauritius, many more young people are seeking education and future employment in the services sector and are less inclined to work in agriculture. This is compounded by the current environment of financial stress in the sugar cane industry and this is a challenge that needs to be addressed urgently. In the short to medium term it may be necessary to examine the economics and practicability of encouraging workers from overseas to help meet the labour shortage during harvest time. This would be encouraged by several industry stakeholders, as stated during the consultation process, to address the shortage and high cost of Mauritian labour. Availability of seasonal labour would particularly benefit small farmers not able to mechanise their fields and reliant on affordable manual labour during harvest and planting times.

Labour law/Collective bargaining

The wage structures for small farmers in the Sugar Cane industry aim to ensure that they receive a share of revenue from all the cane products derived from their cane. This includes receiving the ex-syndicate price for their cane, the price for the molasses, a price per litre of alcohol derived from it and the bagass transfer price. Other workers in the industry (non-agricultural or working on company owned land) benefit from a collective bargaining process which unlike all other industry sectors in Mauritius, operates at an industry level. There are also clauses in the law that state the salaries of workers cannot be reduced which exists regardless of the national legislation around minimum wage. New workers coming into the industry will come in at the specified rate for their level and skills and this can only increase over time. Whilst positive for workers, this intervention with market forces has removed the cane cluster's flexibility to manage their labour costs during times of low sugar price and reduced profitability. This has directly led to the increased use of temporary contracts during a time of reduced profitability across the sector and to better adjust to seasonal fluctuations in labour requirements in an effort to cut costs but it has not addressed the core issue of high wages. These high wages set by the industry for all sugar cane sector related work has disproportionately affected small farmers who have less ability to pay hired labour at the wage level set by the industry.

Lack of access to credit

Without credit systems to cover the costs of replanting fields after the end of a cane cycle, more fields are likely to be abandoned. Microcredit schemes should be investigated at a cooperative level to help farmers with obtaining finance. These could also be considered by the banking sector or government backed private finance schemes and the assistance could be linked to the sugar price so that it is appropriately focussed during times of increased need.

Lack of economies of scale

It will be important that small planters are encouraged to group together to take advantage of greater bargaining and purchasing power. It also increases the opportunity to mechanise their harvest. Without these measures it will be very challenging for them to remain economically viable. The regrouping/Blockfarming schemes that have been operating over the last ten years should be continued, and revised where necessary to take account of the current situation and the types and distribution of farms still able to be grouped.

Follow on from FORIP

Although FORIP has achieved its primary aims of increasing yields through regrouping and mechanisation, it was never anticipated to be self-sustaining. There was a strategy for building up a fund for grouped planters to assist with the costs of replanting each year. Contributions

of between MUR1,800 to MUR 4,500 per annum from each farmer under the FORIP scheme over a period of up to seven years were proposed. However, this amount has reportedly not been systematically collected.

The current sugar price is felt insufficient to cover costs of production and reinvestment. FORIP has been supported the industry and made progress in changing the status of some abandoned land; for example, in 2014 FORIP replanted 100 hectares of previously abandoned land and expects to replant another 100 hectares in 2014 under Phase VIII. However, FORIP has been unable to completely stem the rate of land abandonment as it does not provide assistance with funds to replant. FORIP is also ending in 2015 and will need another entity or scheme to continue the regrouping process. Other mechanisms, such as micro credit schemes and methods of collective purchasing will need to be put in place if small farmers are to reduce costs of replanting and maintain their cane production beyond the end of the FORIP cycle. Each farmer under FORIP is only eligible to go through one cane cycle under FORIP (7-8 years) and after this cycle, they will need to replant their cane due to the cane yield falling below a profitable level.

Additional Measures to Secure Small Planter Livelihoods

The future of Fairtrade

Of the 5,000 or so planters regrouped in Fairtrade certified co-operatives, about 2,500 are reported to have been part of FORIP. There are certain Fairtrade requirements which prevent some farmers applying for FT status if they have been regrouped under the FORIP scheme. It applies when planters wish to merge their Sugar Insurance Fund [7]particulars into a single larger entity, as they would no longer fulfil the FT small producer eligibility criterion (to have less than 10 hectares under cane cultivation). As such, farmers operating in blocks need to change their insurance particulars back to small farmer status (whilst still maintaining their block farming practices) if they are to qualify for FT certification. This is not deemed to cause any loss in benefits to the farmers in losing their block farm status as the main benefits of block farms (improved insurance ranking, reduced losses, increased compensation and lower premium) have largely not met expectations, so many small farmers that are part of cooperatives have changed their insurance particulars back to small farmer status and are now able to join FT whilst still maintaining block farming practices.

The FT scheme needs to focus on long term sustainability. Currently the cost of accreditation (totalling MUR 325,000) is paid by the government. It is expected that the future cost of accreditation will be reduced by over 50% as a result of MSS providing advisory assistance to cooperatives free of charge and, in the long-run, could be self-financed through the Fairtrade premium.

Extension services

Extension services support provided by the clusters could be a substitute for FORIP when the scheme ends. However, clusters such as Medine, or those with high levels of debt (largely due to funding the retirement schemes and upgrading their factory equipment, investing in new power plants etc.) will need financial incentives and support to expand these schemes. This is a critical issue as the mills are largely resigned to the continued drop in production from small planters and the inevitable abandonment of more land. The cane clusters need to act

[7] The Sugar Insurance Fund Board (SIFB) holds a strategic position in the Ministry of Finance as the only provider of compensation against losses in sugar production arising from inclement weather such as cyclones, drought, excessive rainfall and fire. Thus the Fund operates on "compulsory insurance" basis. The two main accounts of the Fund are: 1. The General Insurance Account; 2. The Fire Insurance Account.

proactively to ensure that they have adequate feedstock from these small planters for the mills. At Medine, they are losing roughly 1.5% of their small planters each year. This gap is being temporarily filled by bringing back fallow lands to cane (often more difficult land) but this strategy has a finite life and a more long term strategy is sorely needed.

5.5.4 Retirement schemes for sugarcane industry workers

The VRS, ERS and Blue Print Schemes

A number of retrenched workers have reportedly managed to set up new businesses, though there is no data to confirm this, or indeed data to determine whether workers were successful in accessing other industry sectors. It is therefore likely that there is a large group of ex-cane workers who took retirement, but were not subsequently re-employed on temporary contracts and have not managed to obtain alternative employment. This group are vulnerable to falling into poverty and research is needed to determine the extent of this risk associated with these retirement schemes.

Summary of outcomes of the VRS/ERS/Blueprint schemes

- Cash and land compensation for those under the VRS, ERS and Blue Print schemes is not deemed to have met its intended objective of securing future livelihoods. This is because land was often given as an inheritance to dependents and cash quickly used up.
- It is generally felt among small planters that the pro poor provisions in the MAAS were not sufficient and did not adequately protect those who were not reemployed by the industry, from the risk of falling into poverty.
- Training offered was not at a sufficient level to enable entry into new careers in the majority of cases.

In general, although workers who would now be eligible for a VRS type scheme are keen to see another phase of the VRS as they saw it as a generous retirement scheme to supplement the state pension, the conditions previously in place have changed; factory centralisation is complete and the main issue facing the industry is now a lack of skilled labour. According to the Ministry of Labour this is due to a lack of young people entering the cane industry and a lack of field labourers to help with the small farmer planting and harvesting. This situation puts pressure on existing workers to take on additional tasks and a larger workload as other workers retire to cover the shortfall in skills, which is clearly not sustainable and raises health and safety considerations due to additional workloads. The only sustainable practice would be to investigate ways to incentivise new workers to join the industry.

The manpower planning in the MAAS retirement schemes was based on the premise that there would be new labour recruited to staff the newly streamlined industry; this has not materialised. The industry has struggled consistently to bring in new, young employees. There needs to be a focus on attracting new workers and upskilling them so that they can work within the mill production and marketing areas, whilst seasonal contract labour continues to work in the fields to provide the feedstock. This could be through the expansion of the apprentice scheme.

Current welfare systems

Mauritian labour laws were written in the context of the central role that the sugar cane industry historically played within the national economy and culture. It considered the unique social welfare aspect of the industry producers, who in the past were responsible for

the housing, health, education and welfare of their direct employees and the small planters supplying their mills. As such, those leaving the industry due to restructuring are not eligible to access government welfare and empowerment schemes if they are ex-sugar industry workers, under current laws. This is largely due to historical factors where the sugar cane industry was responsible for all the welfare needs of their workers from health to housing, but these welfare schemes no longer exist and the responsibility for the welfare of workers must now fall to government, as is the case in other industry sectors. There is an urgent need for a reworking of the labour laws to take account of a radically altered industry struggling to survive alongside other industry sectors. Cane clusters are still servicing debt related to the VRS, ERS and Blueprint schemes and will need assistance going forward to cover the wider welfare needs of their workers. The Mauritian welfare schemes need to be extended to cover those leaving the sugar industry in the same way that it applies to other industries.

Section 6: Measures

Introductory comments

Subsequent to the submission of the Draft Report, the Ministry of Agro Industry circulated the Report and sought the views and comments of Government Ministries and Departments, service providing institutions and stakeholders.

The outcome of meetings and written views were forwarded to the Consultants. As expected, numerous views were received on several topics: energy from biomass, mandatory blending of ethanol and gasoline, energy saving in sugar factories, sugar marketing strategies, shares of the Sugar Investment Trust, the importance of support from the Sugar Insurance Fund, the need to have sufficient measures to uphold the public good nature of the sugar industry, and the re-engineering of institutions and employment.

On the basis of the responses received, this section, which deals with Measures, has been reviewed. It now represents a delicate balance in what would be termed in WTO parlance as a Single Undertaking or alternatively as one Unit.

The past, the SIE Act of 1988, the 1994 Memorandum of Agreement between Government and the producers, the 2001 Sugar Sector Strategic Plan and the 2006 MAAS have clearly underscored two aspects:

(a) The optimisation of public and private sector synergies is a *sine qua non* condition;

(b) Monitoring and facilitation, not intervention, is essential; this is what the former Mauritius Sugar Authority ably undertook and what a lean, efficient and talented MCIA will have to undertake.

The erosion and likely loss of preference in the EU marks a dramatic change for the Mauritian cane sector. Even with the preference, and despite the numerous measures implemented under the MAAS, cane area and sugar production have been in decline. Moreover, in its current, reformed structure, the sector still faces rising costs, and industry's income has already started to fall. Compared to the ex-MSS prices of 2012 of MUR 17,573/tonne, the MUR 12,500 of 2014 represents a staggering drop of 29%. Similar drops are expected for the crop in 2015.

The "***doomsday***" scenario of post 2017 has come much earlier and calls for urgent and decisive action failing which the sugar industry would be under severe financial duress leading even to its demise.

These developments mean that many traditional privileges, behaviours and pre-conceived ideas, and legacies of remunerative preferential trade, have to be phased out and new measures ushered in as will be explained in this section.

For instance, it would be unfair to on the one hand, seek major reforms in the employment sector and call for collective agreements at company level, and on the other hand, canvass for keeping the MSS unchanged invoking the argument that it has to bind all producers.

Similarly, the role of the sugar factories as engines of growth and essential components of the competitiveness strategy should be recognised. So far, sugar factories have been considered as subsidiary elements in complete contrast with all other sugar-producing countries.

The causes of weaker industry prices are threefold: (a) lower prices in the EU, which have come about well in advance of the abolition of quotas, (b) greater competition in the markets for special sugars, which is already destroying value in the sector and (c) a strong Rupee.

The consequences of price erosion will be felt at two levels.

- Individual producers, for whom it will translate into lower income per tonne of sugar and threaten their very survival.
- Industry as a whole, for which erosion of income will be compounded by further decline in sugar output. The combined effect of this is that the industry will have reduced capacity to fund its current institutions. The ability of the island's sugar industry to do this is highlighted by the fact that total sugar output of the island is now similar to or less than that produced at several individual sugar factories around the world, from Brazil to the EU, Sudan, Thailand and Zambia.

The sugar industry is an essential public good

A few decades back, the sugar industry had a key social and rural stabilisation role. This has dwindled significantly, in that the sugar industry employs less than 2% of the labour force and small and medium planters have, over the past 10 years, decreased by nearly 40%.

The MAAS had lengthily elaborated on the positive role of cane cultivation in respect of the environment and has explained the risks of the disappearance of this crop. The MAAS also underscored the importance of the cane sector and its strong retention of land for the tourism industry in ensuring that the pristine lagoons are not tampered with and the maintenance of a soothing and appealing landscape.

From the environment perspective, including with reference to enhanced greenhouse and other gas emissions:

- The sugar cane plant is of all cultivated plants, the one that has the highest efficiency in the capture and use of solar energy and in so doing is a major carbon dioxide sink;
- Some 15% of the electricity production of the country, some 350 GWh, comes from bagasse; this avoids the import of some 200,000 tonnes of coal or some 80,000 tonnes of high sulphur heavy fuel oil, the latter also containing carcinogenic poly-naphthalenes;
- The share of biomass can go up through the use of more efficient power plants, reducing the moisture content of bagasse, the introduction of high biomass cane varieties and the recourse to other forms of renewables;
- The establishment of a mandatory framework for the blending of mogas and ethanol would allow the country to move to an E10 mode and thus allow it to move away from zero use of renewable energy in the transport sector;
- Oil economics and availability and additional carbon dioxide emission limitations may, as from the next decade, require a major shift in the transport sector from fossil to biofuels and a higher contribution of biomass in electricity production;
- It is worth noting that one tonne of cane can yield some 80 litres of ethanol if the juice is used for the production thereof;
- A renewable set-up may enable the country to produce at least 700 GWh of electricity;
- In this sense, the cane plant and the industrial set-up associated with it is a considerable resource for the future energy security of the country;

- The cane plant has a very deep and broad radicular system that protects the soil against erosion and this is of particular importance for the maintenance of the sanctity of the pristine lagoons of the country which are so vital for the tourism industry;

- Last but not least, the cane plant is a minimal user of pesticides due to varietal resistance and biological control; in fact, only herbicides are used in its cultivation while nearly all other crops need insecticides and fungicides in addition to herbicides; the low use of pesticides also means low run offs to the waterways and the lagoons.

Additionally for the tourism industry, the sugar cane plantations provide green and smoothing landscapes.

Electricity is produced from bagasse and low sulphur high quality coal from South Africa. The average price of the electricity by companies using these two combustibles is significantly lower than the cost of producing electricity by the Central Electricity Board (CEB). The product of the difference between the cost of the two suppliers and the amount of electricity produced from bagasse and coal is more or less equal to the subsidies granted by the CEB to the export manufacturing sector.

Recommendations

The maintenance of the sugar industry is vital now and will be so in the future from the economic, energy and environmental domains. Its multifunctional role confers upon it the role of the guardian of land and it is thus what is termed an essential public good that needs to be preserved.

In the heydays of the Sugar Protocol, transfers were made from the industry to the economy and society at large via low domestic sugar prices and cheaper energy. The current price drop, a foreteller of the post-2017 situation, calls for a different approach. Transfers are made in many countries to support agriculture and ensure that land remains under commercial production. It is time now for Mauritius to embark on such a venture.

The new measures can range from energy pricing for biomass, tariff protection for locally-produced and used white refined sugar, and the possibility for sugar producers to call back and use their reserves at the level of the Sugar Insurance Fund Board (SIFB).

It is worthwhile noting that, in most countries, the price paid or received per kWh of a renewable source of energy is higher than that of fossil fuels and, even in Mauritius, solar and wind energy are priced higher than high sulphur heavy fuel oil. The reverse applies to bagasse energy; it is priced lower than fossil fuel energy and, in certain cases, price mechanisms act as deterrent to the higher use of biomass.

Quantifying the challenge ahead

Diagram 6.1 combines our projections of the ex-Syndicate prices associated with sales in potential markets — EU (for WRS and special sugars) and the regional market (for WRS and brown sugar) — with our projections of industry viability prices, which are represented by the green shaded box. This excludes the income that planters derive from by-products that amounts to approximately MUR1,000 per tonne of sugar.

While the Diagram 6.1 is based on an average world price scenario of 20 cents/lb, which is justified as being a reasonable base case in the long-run in Section 4, the reality is that prices are currently much lower. Prices have traded below 20 cents/lb for the last couple of years and, at times in 2015, have dropped as low as 12 cents/lb. Therefore, the outlook based on a world price of 15 cents/lb has also been presented, which is our low long-term price scenario (Diagram 6.2).

Diagram 6.1: Outlook for ex-Syndicate prices from sales in potential markets (assuming a world raw sugar price of 20 cents/lb) and the industry's viability sugar price

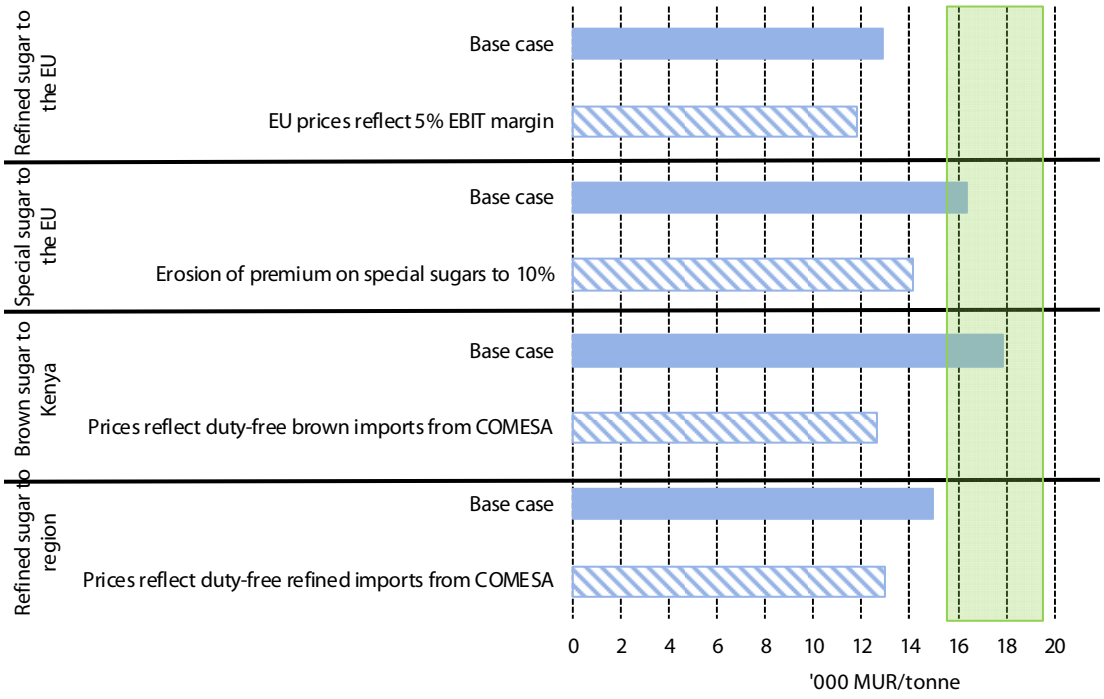
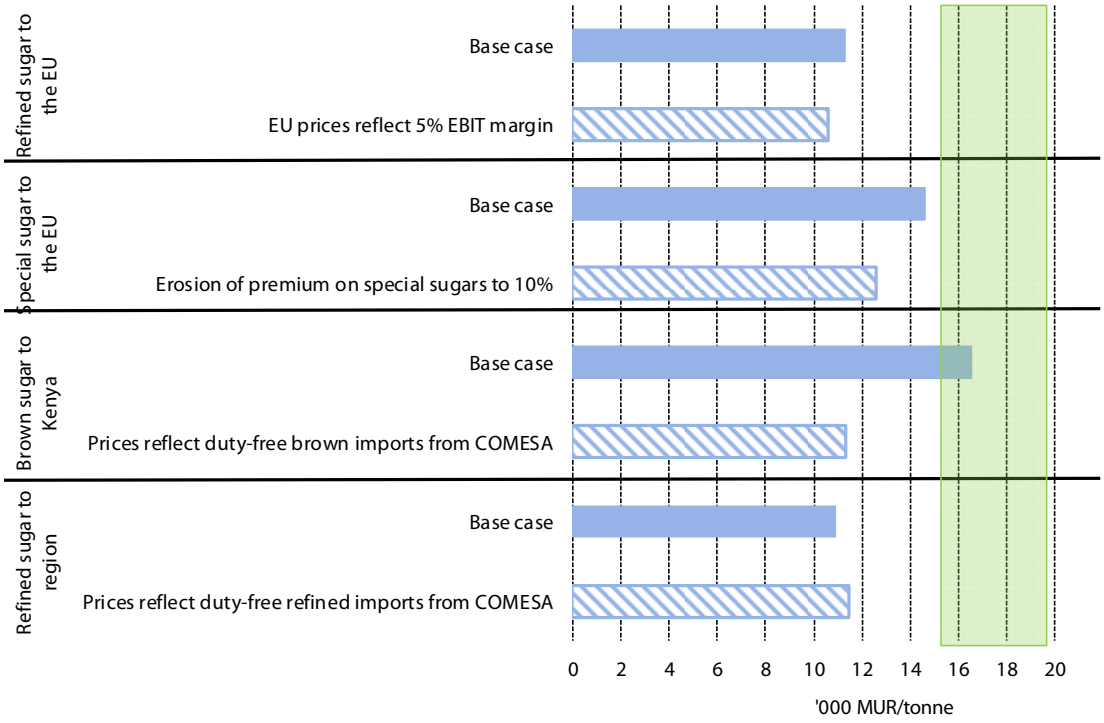


Diagram 6.2: Outlook for ex-Syndicate prices from sales in potential markets (assuming a world raw sugar price of 15 cents/lb) and the industry's viability sugar price



As we discuss in Section 5, there is a broad range of costs within the industry, reflecting the different conditions in which cane is grown, variations in efficiency, debt levels, etc. So, while MUR16,000 may be a reasonable industry-average viability prices today, there is, in reality a range of viability prices that ranges MUR1,000-2,000 on either side of this industry average.

Moreover, unless measures are taken to mitigate the rise in costs, the industry average viability price can be expected to reach around MUR17,000-18,000 before the end of this decade, even assuming that the prices of non-labour inputs fall by 2% per year, reflecting lower prices of commodities. We therefore show costs ranging from MUR15,500-19,500 per tonne.

For this reason, we show a broad range viability prices in the charts. Nevertheless, their conclusions are stark: unless the industry urgently undertakes bold measures to address the challenges ahead, the island can expect to see further significant contraction of the sector, the consequences of which will far-reaching, directly affecting livelihoods, the environment, the economy and the energy matrix.

In this section, we outline key measures to assist this process, covering a range of areas. In Section 7, we quantify the impact these could have on the sector. The specific measures we address are:

1. Sugar sales: new markets and value addition
2. Employment
3. Small and medium planters
4. Environment & social
5. Institutions
6. By-products
7. Measures to contain costs

6.1 Sugar sales: new markets and value addition

Mauritius has been adding value to its sugars in a stepwise manner. Initially, when it was engaged in the sales of raw sugar for refining to Tate & Lyle, a carve-out was negotiated so that special sugars could be sold. These sugars were marketed at a premium over refined sugars and, for a long period, Mauritius was the leader in the EU market and was also the price setter.

The phasing out of the Sugar Protocol and the 36% reduction in EU institutional prices led to a sea change and, within two years, there was a complete shift from raw to white sugar production. In addition, special sugar sales rose from 80,000 tonnes in 2008 to nearly 120,000 tonnes in 2012.

Special sugars

Mauritius is now facing increased competition in the market for special sugars. Initially, attractive prices of special sugar have prompted additional supply from ACP countries. In 2013, New Free Trade Areas (FTAs) concluded between the EU and Central and South American countries that have brought in new and formidable competitors. These countries have a zero-tariff quota for sugars deemed to be raw sugar as per the HS Tariff code. Specials are to be found in this same code. Thus, these countries were able to market some of their raw sugars as specials and also offered price discounts to Mauritian sugars.

These developments have had a major impact on the market for special sugars, and Mauritius has lost market share, which sales falling from 120,000 tonnes to some 100,000 tonnes. Soon, it is expected that prices will come down, reflecting lower prices for refined sugar and a narrowing of the premium for special sugars over refined sugar.

White refined sugar

Bulk white refined sugar from Mauritius that has been sold to Südzucker has been undifferentiated from beet sugar. This strategy was designed to help Südzucker to introduce this sugar into the market place and to ensure it could be sold in markets across the EU. While this may have been a necessary and pragmatic first step, it prevented Mauritius from establishing any brand identity for its sugar.

Under the new marketing arrangements that will take effect for the 2015 to 2018 crops, there will be three innovations: marketing Mauritian sugars as Mauritius cane sugar, going directly to the retail market, and different packing so as to attract new market segments. These are expected to enhance value addition and increase revenue by some € 25-30 per tonne for the overall sugar production. Such value addition may make up the losses incurred due to the erosion of market shares and values in the special sugars segment.

New ventures for further value addition

Members of the Mauritius' sugar-based agro-industry have ambitions to move further up the value chain, for instance through the relocation of operations from the EU to Mauritius. Relocation of a part of the sugar *filière* to Mauritius is possible, but for them to engage in such endeavours requires they have the commercial freedom to negotiate with buyers in the EU and elsewhere.

Recent performance of the he EU agro-industry highlights the potential that this route offers. From 2003 to 2013, the value of EU sugar imports has arisen from €500 million to some €900 million. In the meantime, the value of EU exports of chocolate, confectionery and ice cream has risen from €1,950 million to €4,500 million. For an increase of 90% in the value of imports, the increase in the value of exports has been of 230%. Exports of sugar containing goods represent five times the value of sugar imports. The EU sugar industry plans to further its value added exports as its competitiveness grows.

Opportunities for the Mauritian sugar industry are not restricted to the EU. The country lies close to the economically vibrant East African market, where an emerging middle classes is consuming more value-added products. The Indian market may also offer opportunities.

Any move towards greater value-added requires a competitive industrial set-up, the free flow of raw material to produce higher value-added sugar-containing goods, greater operational and marketing flexibility, as just-in-time delivery and supplier reliability are of paramount importance, and greater entrepreneurial endeavours. This venture, which must be assessed on a commercial basis, will take several years and may represent an important opportunity for the sector after the 2018 crop, when the MSS's new arrangements will lapse.

Regulatory implications

Industrial capacity at optimal use could lead to the processing of up to 600,000 tonnes of sugar. Current use, including NOS, represents some 470,000 tonnes, which is sold mostly to the EU as WRS and specials, with some, mainly special sugars, being sold to the US and world destinations.

Sugar production currently fluctuates around 410,000 tonnes and, unless major measures are taken to halt the contraction of the small and medium sector, this quantity will come down to around 380,000 by 2018. As NOS is limited by rules of origin considerations to a percentage of local production, a decline in local sugar production would lead to a diminution of NOS sugar, unless rules on NOS incorporation, notably in the EU, are relaxed.

As a developing country in its REPA with the EU, Mauritius is currently subject to a regional safeguard ceiling that would restrict the quantity of exports to 520,000 tonnes, white sugar equivalent, if total EPA-EBA supplies to the EU reached 3.5 million tonnes. However, these quantities have never been exported even with the NOS tolerance. Under new rules, there would be no REPA quotas as from 2015 crop, implying a free for all with only the most competitive being able to thrive.

As matters stand, increasing the sugar output of mills from 460,000 to 600,000 would imply a combination of many initiatives and would be based on importing more NOS, including:

- An increase in the EU NOS tolerance level. This may be resisted by beet producers, but could be part of a support measure to Mauritius in lieu of Accompanying Measures, which are less likely to occur now when compared to 2007. Mauritius is making a request to increase the NOS value tolerance to at least 30% from the current 15%.
- Establishing a strong sugar-based agro-industry whereby exports are in the form of sugar-containing goods may enter the EU, and other markets, under other tariff lines and avoid direct competition with locally-produced sugars.
- Toll refining and selling to regional markets in conditions of competition from African countries; this implies a pricing based on marginal cost and profit concepts. As a member of COMESA and SADC, Mauritius would, however, have a competitive edge over producers from outside Africa. However, to be eligible for COMESA and SADC preferences, Mauritian producers will need to incorporate regionally produced sugars to meet Rules of Origin requirements.
- Arrangements for the required logistics for the movement from harbour to industrial units and back.
- Rules that foster such initiatives and allow for just-in-time deliveries.

Recommendations

Loss of preference in the EU, coupled with a challenging commercial environment for special sugars, require the industry to consider routes to further value addition, both within the EU and beyond. Any ventures would have to be evaluated on their commercial merit, whether they are based on island sugar or NOS.

We therefore recommend that Government acts soon to create an enabling framework that makes such endeavours possible. The role or otherwise of the MSS in undertaking export and import activities needs to be reviewed and section 7 of the MCIA Act should not stand in the way of making of Mauritius a sugar hub.

6.2 Employment

Although employment in the sugar industry has evolved greatly over time, the sector continues to confer special treatment that is a legacy of the privileges it enjoyed as a result of the EU Sugar Protocol, which guaranteed access and prices for its sugar. These privileges have been gradually removed and will end soon. This will require further bold reforms of current employment terms, which are addressed in this section. These cover several issues related to employment and the section concludes with recommendations for further reforms:

- Voluntary retirement schemes and the workfare programme
- Collective agreements, strike and arbitration
- Industrial relations and conditions of employment including the small planter aspect
- 7-day working week
- Seasonal labour
- Representations by Trade Unions
- Sustainability indices
- Absence of interaction with employees

6.2.1 Voluntary retirement schemes

Factory closures up till the early 1990s were the object of long drawn-out processes; two factories that had sought permission to close in 1979 obtained it only five years later, in 1984. Moreover, employees were reluctant to collaborate and the outcome was that the concerned employees were redeployed to the factory(ies) receiving the canes of the closed factory. Factory closure requires the permission of the Minister responsible for Agriculture (or Agro Industry, as the case may be) and there were two test cases that set the scene for what was to become the VRS.

- In 1993, Société Usinière de Saint Antoine made a request for the closure of its sugar factory. The novelty was that this Société adopted a different approach for its employees. It proposed that they would be entitled to a cash compensation equivalent to one month per year of service and a compensation in kind in the form of a plot of land with all infrastructure provided. This Société was able to do so as it has obtained a permit from Government to develop a plot of land for residential purposes and subsequent sale. The move of St Antoine was a watershed as it ushered in the key element that would allow sugar reform to proceed further.

- In 1995, the Mount, another sugar factory, sought permission to close down and the case was referred to the Mauritius Sugar Authority (MSA). After negotiations, the latter proposed that employees be entitled to 2.5 months of compensation per year of service plus a plot of land with all infrastructure. To compensate the milling company for its costs, it was allowed to convert land for residential purposes. Additionally, employees had the opportunity of availing themselves of a two-year adaptation period after which they could revert to their package or opt to be on the permanent establishment of the cane-receiving factory.

The stage had been set and, in 1997, the package for employees was codified in the *Blue Print* for factory closure. This document also contains a series of recommendations for planters and the criteria that the mills receiving the canes must adhere to.

In 2000, the Everything But Arms Initiative was presented by EU Commissioner Lamy. It had far-reaching consequences for the EU sugar market and it called for immediate and deep reform. In the same year, Government requested the MSA to come up with a Sugar Sector Strategic Plan 2001-2005. This Plan comprised a package for field employees. The package was along the lines of, but not identical to, the Blue Print. The Sugar Industry Efficiency (SIE) Act incorporated the relevant provisions and schedules. The subsequent MAAS 2006-2015 made some improvements to the 2001 package and the SIE Act was amended accordingly.

The Blue Print for sugar factories closing down, the Early Retirement Scheme (ERS) for sugar factories remaining in operation and the Voluntary Retirement Scheme (VRS) for field employees, all give a choice to the concerned employee.

The voluntary nature has to work both ways, the employer is not compelled to engage in any scheme and the employee is not compelled to accept an offer. In this regard, notwithstanding their differences, these three schemes are voluntary retirement schemes.

In the particular case of a factory closure, the employee may:

(a) accept voluntary retirement with a cash and kind package; or

(b) be redeployed to the factory(ies) receiving the canes of the closed factory. In cases where the business continues, the employee can opt either for the cash and kind package or remain in his current employ.

The attractiveness of these voluntary retirement schemes are best understood if they are compared (Table 6.1) to what an employee in the garments or manufacturing sector obtains. The latter activities refer to exports sectors that are subjected to conditions of global competition which in a few years would apply to the sugar sector.

Table 6.1: Comparison of sugar and other sectors in terms of retirement or redundancy packages

Item	Sugar sector	Textiles and manufacturing
Context	Voluntary Retirement offer	Redundancy and quite often in situations of receivership
Possibility to choose	Yes as schemes are voluntary	No choice
Cash compensation	Blue Print : 2.5 months per year of service ERS and VRS : 2months or 1.5 month per year of service depending on age and tenure of service	0.5 month per year of service and Workfare Programme.
Adaptation period in case of factory closure	Two years and possibility to revert to cash and kind compensation or join permanent establishment of cane receiving factory	Such a possibility does not exist
Basic wage	Above MUR10,000 pm in all cases	Closer to MUR6,000
Kind compensation	Blue Print : 340 to 680 m^2 of land with full infrastructure ERS and VRS : 300 m^2 of land with full infrastructure	Nil
Possibility to dispose of land and obtain its cash equivalent	Yes	Not applicable
Land value in terms of months of compensation per year of service @ MUR2000 per square metre	Blue Print : MUR680,000 to MUR1,360,000 ERS and VRS : MUR600,000	Not applicable
Land value expressed in months of wages	Blue Print : 57 to 101 months ERS and VRS 46 to 60 months	Not applicable

Does monetary value of cash and kind compensation exceed punitive rate for unfair dismissal of 3 months per year of service	Yes Blue Print : more than five months per year of service ERS and VRS : more than four months per year of service	Not applicable
Age preference	Lower package in VRS and ERS for women under 45 years or reckoning not less than 25 years of service and for men under 50 years or reckoning not less than 30 years of service The idea being to discourage younger employees to leave	Same package for all employees
Gender preference	Lower eligibility thresholds for entitlement to the higher ERS and VRS package for women	No preference
Training schemes	Blue Print: Business and Training grants ERS and VRS; Training schemes as per paragraph 6 of the Eleventh Schedule to the SIE Act	Welfare schemes
Children of employees	2 scholarships per company for a period of 10 years to children of concerned employees to follow any diploma/degree course at the University of Mauritius, the University of Technology or any recognised institution	No scheme
Actuarially reduced pension	As from 45 years for women and as from 50 years for men	Wait for attainment of legal pension age

The generous packages for sugar industry employees outlined in Table 6.1 were possible in the first two reforms in the employment sector of this century. In the first case (2001 to 2003), the EU price of sugar had not been reduced; in the second case (2007 and 2008), while EU institutional prices were being reduced by 36%, EU Accompanying Measures were available.

In the context of an Agreement between the MSPA and Government, there were inter alia a transfer of 2000 arpents of land, 844 hectares, to Government, and some €94 M were paid to employees of the sugar industry accepting an offer in respect of a voluntary retirement scheme via a Sugar Reform Trust set up as a special purpose vehicle.

Today, all the sugar factories that had to have closed down have and the centralisation process is over. The Blue Print is *de facto* inapplicable.

In the field sector, over-manning is no longer an issue. Consequently, the main issues now confronting the sector are:

(a) persistent threats of strike action, in fact, a strike which started on 19 November 2014 led to the loss of 15 crushing days, as opposed to arbitration subsequent to the inability of conciliatory mechanisms to address disputes;

(b) a move to a 7-day working week;

(c) multiskilling and multitasking; and

(d) availability of labour, in particular for small and medium who have not mechanised their operations.

Workfare Programme

The Employment Rights Act enacted in 2008 came up with what is termed the Workfare Programme in Part IX thereof.

This Programme is characterised by the following elements:

(a) The payment of Transitional Unemployment Benefit;

(b) The benefit accrues for a minimum period of one month and a maximum period of twelve months;

(c) The Sixth Schedule to the Act provides that the employee shall benefit from 90% of his basic salary for months one to three, 60% for months four to seven and 30% for months eight to twelve;

(d) Assistance for job placement, training and the setting up of a small business is paid by the Programme as are the pensions contributions of the employees;

(e) The Scheme is not available for employees accepting any of the voluntary retirement schemes referred to above , in short , the Blue Print, the VRS and the ERS;

(f) The Programme caters for employees whose contract of employment has been terminated on account of inter alia *economic, technological, structural or similar nature affecting the enterprise*;

(g) Contribution for the Programme refers to all employees , including sugar industry employers, is as per the Seventh Schedule to the Act.

In a near future, the sugar industry would have to reckon with two elements, firstly, the absence of those measures that allowed the implementation of the generous voluntary retirement schemes ; and secondly, economic hardships and technological change as provided for in section 42(1)(a)(iii)(A) of the Employment Rights Act.

In such circumstances, in spite of pressure by Trade Unions to the contrary, employers should not be compelled to undertake voluntary retirement schemes and should instead be entitled to have recourse to the Workfare Programme.

6.2.2 Collective agreements, strike and arbitration

In the past, when conciliation failed to resolve a dispute, it was automatically sent to arbitration. New labour legislation enacted in 2008, in particular section 69(6) of the Employment Relations Act provides that recourse to arbitration requires the consent of parties to the dispute. Failing which, the trade unions can have recourse to a strike and the employer to a lock out.

In 2010, trade unions threatened strike action and the then Government compelled the MSPA members to accept a staggered 20% wage increase for the duration of a collective agreement for the 2010 to 2013 period.

Negotiations prior to a new collective agreement have to begin well before its commencement and this was the case in 2013. Failure to agree led to Parties to solicit the good offices of the Commission for Conciliation and Mediation (CCM). After a protracted process, the CCM came up with a staggered wage increase of 15% in comparison to the employers' offer of 10.5% and the Trade Unions request of 40%.

Both sides rejected the conciliation proposal and the trade unions, after completing all the procedures specified in the Employment Rights Act, went on strike for some nine days but which in fact led to a loss of 15 crushing days. The strike action took place three weeks before a general election and once again the outgoing Government compelled the MSPA to renounce all its requests for a win-win collective agreement and imposed a 13% wage increase. The 2014 -2017 collective agreement was signed on 28th November 2014 with a staggered wage increase of 13%, 7% as from 1st January 2014, 3% as from 1st January 2015 and 3% as from 1st January 2016. The requests of the trade unions for a 40% increase as well as several other union requests were to be sent to an arbitrator.

Article 4 of Convention 98 of the International Labour Organisation (ILO) specifies:

> *Measures appropriate to national conditions shall be taken, where necessary, to encourage and promote the full development and utilisation of machinery for voluntary negotiation between employers or employers' organisations and workers' organisations, with a view to the regulation of terms and conditions of employment by means of collective agreements.*

The *full development and utilisation of machinery for voluntary negotiation* is hampered by the use made of section 69(6) of the Employment Rights Act. The right to strike action is not at issue but the fact that strike action is at the end of the tunnel may act as a licence for unreasonableness in negotiations and in the CCM. This has unfortunately occurred on two occasions.

Strike action, let alone unreasonable wage increase requests, was damaging to the sugar industry in 2014. It will be even more damaging in the future when the sugar industry will have to maintain a high level of performance in terms of reliability of supply and just-in-time delivery if it is to survive in a more competitive market environment. Risks of permanently losing clients exist already and will be higher in the future. No employer cognizant of the market risks will ever imagine that he can have recourse to a lock out.

In the course of meetings with stakeholders, the representative of the Ministry of Labour and Industrial Relations indicated that the provisions of section 69(6) were motivated by the obligations of the country pursuant to Convention 98 of the ILO.

Strike action is manageable if undertaken at the level of one production unit, but it becomes a major hazard when it applies to the whole industry in that it cripples the country, the industry and all stakeholders including small and medium planters.

It is noted sub-paragraphs 3(c) and 3(d) of the communique relating to the Cabinet meeting of 27th March 2015 mentioned that:

> *Cabinet has agreed to the Employment Rights Act and the Employment Relations Act being reviewed as announced in Government Programme 2015-2019. The main objectives of the review would be to –*
>
> *(c) reinforce freedom of association and negotiating rights in line with ILO Conventions; and*
>
> *(d) reinforce the dispute settling mechanism for a timely and more effective settlement of disputes.*

The decision at sub-paragraph (d) offers a unique opportunity to instil reason in offers by both sides. Timely and more effective dispute settlement will, while respecting the rights of all, ensure that sectors like the sugar industry are not crippled. This is also true for the hotel, energy, BPO sectors which cannot afford strike action.

Under this heading, it is fitting to quote the provisions of section 34 of the Employment Relations Act, namely:

> *The principal aim of trade unions of workers is to promote their members' interests. They can do this only* ***if the undertakings in which their members are employed prosper****. They therefore have an interest in co-operating in measures taken to promote efficiency. They also share with management the responsibility for good employment relations.* (Highlighting ours)

Collective Agreement at sector or at enterprise level

In 1994, 2010 and 2014, Collective Agreements were entered into between the members of the MSPA and the representative and recognised trade unions of the sugar industry. From 1994 to date, the number of members of the MSPA has dwindled and more and more the terms and conditions applicable to these companies are not automatically applicable to non-members.

More importantly, there is a considerable diversity among the 12 members of the MSPA, three are millers and nine are growers. In acreage terms, the ratio of the largest to the smallest is seventeen times. In sugar accruing terms, the ratio of the highest to the lowest one is thirty times. Consequently, it cannot reasonably be argued that there should be a "*one size fits all*" approach for MSPA members regarding wage and other conditions.

In this regard, it is noted that the members of the MSPA are engaged in a four year collective agreement from 2014 to 2017 and cannot opt out of it. Thereafter, it would be more than logical that there be collective agreements at enterprise levels. Additionally, this approach would coincide with the abolition of EU country sugar quotas.

By-passes to the collective agreement

Collective agreement is a positive development in the realm of labour relations and should be ring-fenced in particular from Government intervention, which happened in 2010 and 2014. Additionally, there are remuneration orders that govern employment in the sugar industry and employers claim that, once employees have benefitted from the collective agreement and the Government awards, they also use the route of the National Remuneration Board to secure a further gain. The claim is that the remuneration rules be consolidated and taken as a single package.

In this regard, it is noted that the above-mentioned Cabinet Decision of 27 March 2015 also mentions that it is the intent of Government to:

> *streamline all conditions of employment prescribed in the various Remuneration Regulations in one piece of legislation;*

In the case of the sugar industry, it is necessary to consolidate all the terms and conditions of employment in one single document, namely the collective agreement.

In this regard, section 56 of the Employment Relations Act is pertinent:

> "*Payment systems shall be periodically reviewed to make sure that they suit current circumstances and take account of any substantial changes in the organisation of work or the requirements of the job.*"

6.2.3 Industrial relations and conditions of employment including the small planter aspect

Until 1994, industrial relations in the sugar industry were governed by the provisions of Remuneration Orders (ROs). In that year, intensive negotiations led to a collective agreement known as the *Protocole D'Accord*. Such an agreement, which provides an opportunity to employers and Trade Unions, should be viewed from a global perspective, especially given the difficulties now facing all partners of the industry.

In the past and until now, the wages and salaries of employees of the sugar industry increase by virtue of: (a) collective agreement and (b) a cost of living allowance (COLA), which is the yearly increase awarded by Government following tripartite consultations between Government, employers and employees. The COLA is meant to make good the loss in purchasing power due to inflation.

In fact, employees of the sugar sector receive a double compensation for loss in purchasing power. The impact of this mode of double compensation is shown in Table 6.2 hereunder. The calculations in the table use the outcome of the latest collective agreements, namely 7% in year one, 3 % in years two and three and 0% in year four. The yearly COLA is assumed as being 3% given the current inflation rate and the wage levels of employees of the sugar sector.

Table 6.2: Impact of double compensation for purchasing power loss

	Year 1	Year 2	Year 3	Year 4
Collective agreement percentage	7%	3%	3%	0%
Year 0 =100	107%	110%	114%	114%
COLA adjustment percentage	3%	3%	3%	3%
COLA and collective agreement compounded percentage	110%	117%	124%	127%

This is one of the various elements that differentiate employees in the sugar sector from those of the textile and manufacturing sector. A comparison between the two sectors is presented in Table 6.3.

Table 6.3: Remuneration package comparison

Item	Sugar	Textile and manufacturing
Compensation for loss in purchasing power	Collective agreement yearly compounded by the COLA	COLA only
Net increase for a yearly COLA of 3% after 4 years	27.3%	12.6%
Elements of a fixed nature that substantially enhance the take home remuneration	(a) Primes D'Assiduité et d'Ancienneté, Productivity Bonus, Prime de Presence Annuelle and End of Year Bonus (b) Travelling Allowance / Bus Fare / Transport, Meal & Milk Allowance, Daily Replacement Allowance, Field Workers Allowance, Leaves and other job specific allowances such as Driver's Allowance, Tyre Repairer's Allowance, Daily Replacement Allowance, Disturbance Allowance etc.	Minimal allowances of a permanent nature and end of year bonus
Pension contribution by employee % of basic wage	3	3
Pension contribution by employer % of basic wage	10.5	6
Capacity to pay of employer	All employers pay same rate as per collective agreement	Capacity to pay intervenes in the payment of employees
Retrenchment	Blue Print, ERS, VRS	Normal schemes as provided for in legislation
Recourse to Workfare Programme	None in spite of contribution to Workfare Programme	Access to Workfare Programme possible
Liability of job contractors	Joint and several liability of sugar company and job contractor	Liability only for job contractor
Seasonal labour	Constraints in spite of the fact that the activity is seasonal	No constraints
Foreign labour	Not yet authorised	Authorised subject to rules and regulations

A yearly COLA of 3% would mean an increase 13% for non-sugar workers after four years and 27% for sugar workers. The preferential system of price and access guarantees of the Sugar Protocol permitted the special and differential treatment. The special circumstances of the 2011 to 2013 crops, when EU market prices were high, may also have sustained such a situation.

However, the sugar prices that the industry can expect to receive in 2014 and 2015 cannot sustain such pay awards, and this will remain the case beyond that date if EU market prices stay at reduced levels. Accordingly, while it is feasible and opportune that the COLA applies to enterprises that are subjected to ROs (i.e., where there is no collective agreement), it would be appropriate in cases where there is collective bargaining that the parties should be able to define their own priorities and agree on salary increase based on loss of purchasing power and productivity gains, notwithstanding that there are other fringe benefits as well that are regularly upgraded. For example, the civil servants were not paid the annual wage compensation when the last PRB was implemented.

The representative of the Ministry of Labour has mentioned that a future collective agreement could address the issue of double compensation.

This can be envisaged if a collective agreement encompasses a proper quid pro quo as opposed to the 2010/13 and 2014/17 which refer essentially to wage increases.

Small and medium planters and labour legislations

Small and medium planters do not have any requirement to maintain a permanent labour force as per the definition given in section 33 of the Employment Rights Act. This states that planters cultivating less than 10.55 hectares (25 arpents) do not need to provide intercrop employment to eligible employees. Said otherwise, it means that small and medium planters do not need to keep a permanent labour and, in fact, they do not do so.

In times when the labour force was abundant and willing to work in cane fields, this provision of the law benefitted these planters in that their recruitment of labour matched the seasonality of cane cultivation. Nowadays, labour is scarce. Few, if any, of the unemployed wish to work in cane fields. As a result, small and medium planters are in a weak, to say the least, bargaining position in the labour market. The frequent improper sequencing of harvest, transport and milling further weakens their position. Rates paid by them are 1.25 times those incurred by the corporate sector.

In fact, whatever increase is applicable to the MSPA members, applies more or less automatically to small planters.

Entry of youngsters in the sugar sector is almost non-existent and the activity is serviced by an ageing, and often over-aged, labour force. In time, there is a serious risk of labour unavailability. Mechanisation of cultural operations is well advanced in the case of the corporate sector, except in super humid regions, and is minimal in the case of small and medium planters. Full mechanisation will take time and can be quite expensive. By 2015, €80 million have been devoted by Government to the FORIP through the recourse to EU Accompanying Measures, but little progress has been made by way of preparing land for full mechanisation.

The import of labour to work on a seasonal basis could afford an attractive alternative for these small planters. However, the dispersion and size of their holdings are major constraining factors and only well managed units could import labour and offer competitive rates to small planters.

The Mauritius Cooperative Agricultural Federation seems to be an ideal institution to set up a unit with imported labour.

6.2.4 7-day working week

In most sugar-producing countries, in particular those that are direct competitors, the seven day week is applicable, with stoppages occurring only for maintenance periods. This practice is not possible in Mauritius for two reasons: (a) the very high hourly rates for Sundays and (b) the strong resistance of trade unions to work on this day. Many employees do accept to work on Sundays provided that that it is on a voluntary basis and they are paid the prevailing rates for that day.

Sucrose content is optimal from the months of July to November, i.e., some 150 calendar days but sugar factories operate for only 132 days due to Sunday stoppages. The Sunday work issue has become acute in some, but not all, cases on account of the necessary process of factory rationalisation. The existence of fewer factories results in a higher cane availability per factory and factory operations now run from early June to mid-December and even end-December.

This is neither optimal for sucrose content, and thereby sugar recovery, nor for cane growth in super-humid areas, where growth stops at the end of April. A late harvest in these areas means reduced growth season, which has a negative impact on cane yield. Factory stoppages impact on sucrose recovery and stop-starts require higher energy meaning lesser renewable energy sold to the grid.

Operation on Sundays would provide an additional day for small planters to carry out their harvest. Moreover, family and hired labour are both more readily available on this day. A move to seven-day harvesting would therefore benefit planters, and sugar factories may also devote Sundays for the reception of small planter canes, as far as possible. This would bring greater certainty to the small planters who, alone or with contractors and/or millers, can better plan the harvest, its transport and its milling. This would go a long way in solving by far the most important hassle of small planters, namely harmonising harvest, transport and milling operations. Untimely harvest, resulting in long harvest to crush delays, can result in sucrose losses of up to 10%, and bring about higher harvest and transport costs.

In the course of a meeting with the representative of the Ministry of Labour and Industrial Relations, the point was made that work on Sundays is possible but payable at rates spelt out in law for this particular day.

The working week is as from 1995 of five days in the intercrop season and six days in the crop season .Some Trade Unions have raised the issue that what they term as "*unduly*" long crop seasons reduce the 5 day intercrop season.

The solution to this problem would that the production units operate on Sundays as well as a better cane allocation between sugar factories. This would require a re-definition of factory areas which it is understood the MCIA is planning to undertake shortly in collaboration with stakeholders and the establishment of Rules that a sugar crop in a given factory area should as far as possible be limited to 150 crushing days. This would optimise existing capacity and represent a win-win for all parties.

6.2.5 Seasonal labour

The first wave of Voluntary Retirement occurred in 2001 and the relevant provision of the Labour Act, now the Employment Rights Act, was amended to provide flexibility in the use of seasonal labour in recognition of the highly seasonal nature of the activities of the sugar industry. The law was amended in the 1960s to ensure that employees who had performed a certain quantum of work in the crop season be eligible for work in the inter-crop season. This in fact made the employment become permanent. The law was amended in days when the sugar industry was by far the most important employer and unemployment was a real scourge. 60 years later, the situation has drastically changed.

The amendments of 2001, which are still in the statutes book, provide that the number of man-days work performed by seasonal workers in a given year, employed directly by sugar companies or indirectly through job contractors, shall not exceed 20% of the number of man-days undertaken in that year by those workers who were in employment on 31st May 2001.

As young people no longer join the industry, seasonal workers are in fact previous employees who opted for voluntary retirement schemes. The latter have aged and, as time passes by, availability of workers will become problematic. On account of its level of preparation for mechanisation, the corporate sector can cope with a growing dearth of labour.

This is not the case of small planters. A scheme whereby the corporate sector provides assistance to the planters for one or more cultural operations would require the recruitment of further seasonal labour, which the 20% threshold constrains. Additionally, this threshold prevents the recruitment of additional persons in times when economic growth is slow.

6.2.6 Representations by Trade Unions

Trade Unions representing the employees met the Consultant. In addition to the ongoing negotiations between the MSPA and the Joint Negotiating Panel, a certain number, but not all, of recognised Trade Unions highlighted the following:

- The TOR did not make any specific reference to employees who, according to them, draw their living solely from cane and sugar activities, as opposed to planters who, again according to them, were mainly part timers drawing a small proportion of their total revenue from cane;
- As a consequence, they were cognisant of the threats affecting the sugar industry and were committed to its viability as it was their sole source of income;
- The commitments to provide land with all infrastructure, in particular, and training schemes stemming from the past reform had not yet been fulfilled in many cases;
- There were no schemes to upgrade the skills of employees and there are no avenues to attract youngsters in the industry;
- "*Unduly*" long crop seasons spanning 180 crushing days plus 25 Sundays have the effect of reducing the five day intercrop season;
- The phasing out of the Trade Unions Modernisation Fund that had been introduced in the MAAS.

Invitations were sent to all stakeholders to also make written representations to the Consultant but only the Trade Union representing staff submitted a memorandum.

It was only after the submission of the Draft Report that a group of Trade Unions submitted a letter to the Ministry of Agro Industry which was forwarded to the Consultants.

6.2.7 Sustainability indices

Most of the large sugar companies of Mauritius are listed on the main market of the Stock Exchange, while the smaller ones are listed on the secondary market. The Stock Exchange of Mauritius intends to introduce a system of reporting on sustainability that includes the social dimension. Equally, one sugar company, Omnicane is already complying with a certain number of standards of the Global Reporting Initiative. While there is a premium for small planters in cooperative societies in respect of the Fairtrade Initiative, there is none for compliance with labour norms and social inclusiveness.

Any measure to reckon financially with this aspect would foster the competitive edge of Mauritius and bridge its competitiveness gap with those countries that have lower labour standards and, therefore, have lower costs.

6.2.8 Absence of interaction with employees.

The MSA had two fora where interaction with employees was possible. Firstly, the Advisory Council, which comprised representatives of all stakeholders, and which allowed partners of the industry to confront ideas and most importantly, engage in dialogue. The MCIA Act has repealed this council. Secondly, in 2006, the MSA had established a Trade Union Modernisation Fund which was jointly managed by the MSA and the trade unions and whose funds were used for specific projects prepared by trade unions. As from 2009, the Fund had not been operational.

As indicated in the Stocktaking section, the land entitlements were unduly delayed by a host of administrative hurdles and this has been resented by employees. From 2002 to 2008, the implementation of schemes concerning employees was monitored by a committee chaired by the Minister of Agro Industry. This committee has been re-established in 2015 and is expediting matters.

It is noted that threats of strike action and indeed a strike have come after 2009. In addition to the measures relating to sections 69(6) and 34 of the Employment Rights Act, provision has to be made to foster dialogue between all stakeholders and between the MCIA and Trade Unions.

6.2.9 Recommendations: package to adapt to new circumstances

The attractive remuneration and compensation packages of the past were possible as the EU Sugar Protocol guaranteed access and prices, and provided Mauritius with a buyer of last resort. This will no longer be the case in the future, and the rules of yesterday have to be adjusted to reflect this new landscape.

The sugar sector is today carrying rules and practices that date back to times when sugar accounted for some 90% of net exports, 30% of GDP, 30% of employment and was covered by preferential trade agreements guaranteeing access and remunerative prices. Currently, sugar accounts for some 15% of net exports and accounts for less than 2% of the GDP and employment, and the industry will shortly have to fight for every tonne of market access in a highly competitive environment.

For decades, the sugar industry has survived, through thick and thin, on account of many factors, of which the commitment and toil of its employees stands out. Accordingly, any package, while adapting to circumstances, must also ensure that employees participate in the ventures of the enterprise.

Sugar Investment Trust dividends and active employees

This aspect is taken up in the part on small and medium planters; suffice it to say, that a new approach whereby part of the dividends of the Trust be payable only to active employees could provide additional revenue to them. The possibility to redeem these shares could also provide better revenue streams to these employees.

Recommendations regarding Employment

In this regard, the following is recommended:

- *In a context of drastic price reductions and the absence of support measures as in 2001 and 2007/08, an employer should have the choice of opting for the Workfare Programme or having recourse to a voluntary retirement scheme;*

- *The maintenance of differential treatment for pension contribution;*
- *Multi-tasking and multi-skilling of employees and a corresponding salary grid that rewards skill and experience;*
- *More focused training schemes for workers in employment with clear job opportunities offered to them ;*
- *Greater responsibilities offered to employees so that their contribution to the overall performance of the enterprise increases;*
- *New shares pursuant to the December 2007 Agreement between Government and the MSPA to accrue to active employees;*
- *The possibility for holders of SIT shares to redeem them;*
- *Mauritius should canvass for the link between its exports and compliance with environment and labour norms, as this confers a competitive edge and obviates the cost disadvantage of having to comply with such norms; the canvassing may be done at political level or at the level of buyers who could publicise the compliance — the model of Fairtrade could be viewed as an example;*
- *Greater efforts towards mechanisation and automation, wherever this is economically feasible in current circumstances;*
- *Collective bargaining at company level once the current collective agreement lapses;*
- *With due regard to section 56 of the Employment Relations Act , opportunity should be taken of the review to streamline remuneration orders to consolidate all terms and conditions of the sugar industry into one document;*
- *The type of Government intervention that occurred in 2010 and November 2014 should be avoided bearing in mind the fact that Government has a role as ultimate arbitrator;*
- *The situation whereby the compensation receivable , under a collective agreement and the COLA, substantially exceeds the compounded inflation rate without any quid pro quo purporting to enhance the viability and employability of an enterprise , has to be addressed; section 34 of the Employment Relations Act is pertinent in this context;*
- *No limits to the use of seasonal labour;*
- *Section 69(6) of the Employment Relations Act should be reviewed in the light of the forthcoming review undertaken by Government, as in the Cabinet Decision of 27 March 2015, so as to avoid endless disputes and strike action which the sugar industry cannot now, and even more in the future, afford given the new commercial set up;*
- *A seven-day week operation time for sugar factories, with a six-day week for employees;*
- *Rules limiting, as far as possible, a sugar crop in a given factory area to 150 crushing days; coupled with work on Sundays, this would avoid the recurrence of long crop seasons as in 2014;*
- *Import of labour to alleviate the labour shortage of small planters by an institution capable of offering services at competitive rates. The institution could be the Mauritius Cooperative Agricultural Federation;*

- *The replacement of the existing MCIA Board by a lean board and a stakeholder Advisory Council as was the case with the MSA;*

- *The establishment in law of Trade Union Modernisation Fund with a yearly amount of MUR 3 million , obtained from sugar proceeds as from crop year 2015 till 2018, year when the Mid-Term Review of the new MAAS will be effected.*

6.3 Small and medium planters

6.3.1 Major drop in numbers in spite of entitlements and incentives

In 2004, there were approximately 27,500 small and medium planters, the number has fallen below 17,000 in 2013, a drop of some 40%. This has occurred in spite of the fact that small and medium planters benefit from high level of sugar and by-product entitlements, favourable tax regimes and concessionary finance. Moreover, Government has already injected some €70 million in the FORIP project and is likely to disburse a further €10 million in 2015.

The planter in Mauritius, as shown in Table 6.4, is the one having the highest accrual of proceeds and revenue in comparison to his counterparts worldwide.

Table 6.4: Comparison of entitlements

Item	Mauritius	Elsewhere
Percentage of sugar in cane	78%	Not more than 74%
Mill efficiency	Lower efficiency is at expense of miller, even if planter is supplying low quality canes	No such provision
Molasses	100%	Molasses accrues to millers but in certain cases raw material payment system includes a molasses value
Payment for bagasse	Yes if used for purposes other than sugar manufacture	Payment rare except in French DOMs where the EU Commission and/or the Sate provides funds
Distiller-bottler contribution	Yes, MUR270/tonnes of sugar, further amounts recommended in molasses study	Nil
Equity participation	Sugar Investment Trust for small and medium planters only	Nil

In addition to these entitlements, small and medium planters also benefit from:

- Exemption from payment of Income Tax for revenue accruing for up to 60 tonnes of sugar or the proceeds from up to 10 hectares;

- Concessionary finance and grants under the FORIP;
- 80% crop loan scheme at concessionary rates as soon as sugar is consigned to the MSS.

In cases of factory closure, planters have the choice of bringing their canes to the loading zone of the closed factory or to the factory that would mill the canes. In both cases, they are refunded extra transport costs whenever the distance from the plantation to the point of delivery exceeds 6.4 kilometres.

6.3.2 Survey of the Sugar Insurance Fund

A survey conducted in 2010 by the Sugar Insurance Fund Board on land abandonment for the 2001 to 2010 period, which was released in 2011, identified numerous reasons leading to this abandonment. Figures and data obtained from the SIFB indicate that the pre-2011 trend has continued till 2014 in spite of the fact that sugar prices from 2011 to 2013 have been comparable to those prevailing before the Sugar Protocol was phased out. Bold measures taken in August and December 2010, re-introduction of the 80% crop loan scheme, capping the cess at 4% of the ex-MSS revenue, introduction of a levy on potable alcohol sold on the home market representing some MUR270 per tonne of sugar, new facilities for Small and Medium Enterprises (consolidated in 2011 and 2012) could not halt the downwards trend.

Abandonment cannot be said to be due to low prices, absence of funding or incentives. The SIFB Report identified a certain number of reasons, namely:

- Low rate of return on investment;
- Increases in costs of production;
- Succession problems;
- Shortage of labour;
- Transportation constraints;
- Financial constraints;
- Age and health constraints;
- Land topography and soil type;
- Time and other professional constraints.

The reasons can be regrouped in three categories:

1. Planters are ageing and the new generations are not willing to take over;
2. Labour and transport are major obstacles to overcome;
3. Investment in cane is not remunerative vis-à-vis other activities.

Changing (ageing) demographics

Ageing and its consequences, and the movement away of new generations to towns or overseas, is not limited to Mauritius, it is a worldwide phenomenon. In the past, indentured workers, through hard work and judicious savings, were able to acquire land from the larger sugar estates and evolved from the status of labourer to that of planter. Their toil and endeavour allowed them to fund the studies of their children, many of whom today have

evolved to the middle and upper classes and are present in all walks of professional activities. At the same time, the initial plots were time and again divided leaving a large number of small plots of land. Time is now a precious and rare factor and the revenue derived from small plots of land is of little interest to many planters engaged in other activities and deriving a major part of their income elsewhere than in cane.

Labour availability and cane transport

The absence of economies of scale and the unpreparedness for mechanisation of cultural operations puts planters at a disadvantage; they have to bear the full brunt of tight labour and transport markets. In fact, more often than not, planters have to harvest their canes at a time where they can dovetail availability of labour, availability of transport facilities and the obtention of cane quotas at the sugar factory. In such cases, harvesting the cane at optimal yield and sucrose content is not the primary motive. This situation has two negative consequences: (a) costs are higher, given the weak ,or even absence of, bargaining power and (b) revenue lower on account of the sub-optimal timing of harvest.

Planters have small plots with improper access roads and this does not facilitate access for transport vehicles. Moreover, on account of their size they are compelled to have recourse to small lorries carrying up to six tonnes. In comparison, large production units are able to hire lorries or use tractors that can carry at least 20 tonnes.

Planters were not required to maintain a permanent labour force nor did they organise themselves in multipurpose cooperative societies or other forms of association to employ workers on a permanent basis. In the days of high prices and abundant labour, they enjoyed the prices and avoided paying fringe benefits, some 75% of basic wages, to employees. In a context where prices are falling and labour is unavailable, the special and differential treatment of the past and the shielding of planters from market conditions has turned out to be a "*cadeau empoisonné*".

Land conversion

The SIFB Report did not mention one important element, namely legislation on land conversion. In April 2005 and then in September 2005, the SIE Act was amended to allow planters, growing not more than one hectare of land to convert that land without payment of land conversion tax and without having to submit an application to the Land Conversion Committee subject to the land being: (a) outside an irrigation zone and (b) in an area where development other than agriculture is permitted.

This measure was taken at the same time as an amount of MUR500 million was earmarked for the upgrading of the plantations of small planters to render them suitable for mechanisation. The objective was to support those planters that would have to stay in agriculture and allow those in development areas to optimise the realisable value of their assets.

The land conversion measure was extended in 2010, subject to development area and irrigation zone considerations, but the extent cultivated was increased from 1.0 to 4.2 hectares and the convertible extent from 1.0 to 2.0 hectares.

These measures came at a time when the corporate sector was engaged in land parcelling or *morcellement* to recoup costs incurred in the sugar reform. In 2006, Government introduced the Residential Estate Scheme, an emulation on a smaller scale of the Integrated Resort Scheme undertaken by large land owners, to facilitate the entry of small planters into the upmarket property sector.

These measures on land conversion and development together with the relative unattractiveness to many land owners of cane cultivation brought about a new way of thinking. Land was not considered from an agricultural perspective but rather from its optimal use, including residential or commercial uses. Funds came in large quantities upfront as opposed to the trickles from cane cultivation. One hectare could yield MUR24,000 annually, while the sale could yield MUR5 million at one go.

The cooperative movement

The development of cooperatives was a response to some of the challenges facing small planters. The cooperative movement started in 1913 and cooperative credit societies (CCS) were established whose main purpose was to receive proceeds from the sale of sugar and distribute them to members and make crop advances. The CCS evolved at village levels and, in some cases there were more than one CCS due to different schools of thought. The CCS are regrouped in one federation termed the Mauritius Cooperative Agricultural Federation (MCAF).

In the mid-1990s, following problems encountered by the Mauritius Cooperative Central Bank, the Cooperative movement experienced tough times and many planters left the CCS and asked for their proceeds to be credited directly to their bank accounts.

Efforts were made in the early 1990s to launch multipurpose cooperative societies, but they faced strong resistance from the CCS and this initiative did not survive the crash of the Cooperative Bank.

In the late 1990s and the early 2000s, the MCAF undertook numerous efforts to acquire chemical inputs in bulk so that its members could enjoy economies of scale. This venture has been quite successful. But the Cooperative movement at large has not been successful in being able to contract out labour and transport, the two sore points of small planters.

The members engaged in the Fairtrade Initiative, which we discuss further below, have regrouped themselves in a federation.

Summary

The task in respect of the small and medium planter sector is complex. To date, the response has been to rely on special assistance and a reduction of the entitlements of millers. Such recipes have not prevented a steep decline in the number of small and medium planters. Moreover, there are no longer surpluses that can be transferred from within the sector without threatening the ability of the industrial set-up from taking initiatives and investing to secure their own future and the future of the sector as a whole.

Taking consideration of these formidable challenges, the TORs of this study require the Consultant to develop:

> *A bold and innovative plan to ensure that small planters continue their involvement in sugar directly or through other means.*

6.3.3 Redeeming features

Notwithstanding the issue of cane abandonment, there are a few redeeming features that have emerged in the last decade, namely the Fairtrade Initiative, the FORIP, the Planters Harvest Scheme and cultivation agreements between planters and millers.

Fairtrade

The most potent one is the Fairtrade Initiative, which now involves some 5,000 cooperative planters and some 22,000 tonnes of sugar. This Initiative imposes a stringent "*cahier des charges*" on participants and only a person committed to cane plantation would be prepared to engage in such a venture. This Initiative, wholly to the credit of the MSS, is expanding. It is understood that they can move from 22,000 tonnes now to some 40,000 tonnes by 2018.

Fairtrade (FT)[1] was introduced into the Cane Industry in Mauritius in 2009 and has provided a number of benefits to those who have joined the scheme. It covers several important social issues associated with the cane industry, as detailed in *Table 1.7*.

Fairtrade Social Requirements

FT Compliance Standards
• Labour Conditions/conditions of employment/OHS
• Freedom from discrimination/Freedom of Labour
• Child labour and child protection
• Freedom of association and collective bargaining
• Democracy, Participation and Transparency

Its benefits are not restricted to economic factors, though the premium paid to FT farmers has undoubtedly been a large incentive for small farmers to aspire to becoming Fair Trade certified. The FT premium is the additional sum of money paid on top of the minimum sugar price that farmers and workers receive. This can be invested in social, environmental and economic development projects to improve their businesses and their communities. In real terms, it means investment in schools, transport, health care, sanitation, an improved environment and better business equipment and practices. The main economic provision of Fairtrade Standards in sugar is the Fairtrade Premium of US$60 per tonne of sugar (US$103 per tonne for certified organic sugar) in addition to the negotiated price.

FT certification has also given farmers a new sense of value and status in their profession and a sense that they are part of a global initiative that recognises and rewards their work.

In the first phase of FT, five Cooperative Credit Societies (CCSs) achieved accreditation with a total of 27 cooperatives becoming FT certified under Phase II. In 2013, this accounted for approximately 13,500 tonnes of sugar. Other cooperatives are keen to begin the certification process but before this can be realised, new markets have to be found to sell FT sugar as current commercial arrangements enable the sale of only 13,500 tonnes per year. More marketing needs to be done to suppliers of FT sugar to enable an increase in FT production in Mauritius.

Table 6.5: Estimated FT cane production by area

Factory Area	FT Cane Area (hectares)	FT Cane Production (tonnes)
Terra	500	35,000
Medine	2	200
Omnicane	700	50,000
Alteo	1,800	130,000
TOTAL	3,003	215,200

Source: MSS, November 2014.

[1] For further information on FT certification process, consult Fairtrade Standard for Cane Sugar For Small Producer Organizations Current version: 29.08.2011: www.fairtrade.net/standards.html.

Table 6.6: Fairtrade cooperatives distribution

Region	Canes milled at	No' FT Co-ops supplying cane (2013)	% of total FT Sugar (2013)
North	Terra	11	16.6
South	Omnicane	17	23.7
Centre-East	Alteo	26	59.6
West	Medine[2]	6	0.1
TOTAL		60	100.0

Source: MSS, November 2014.

FORIP

In Mauritius, there are two main categories of cane producers: the corporate miller planters and large planters cultivating cane on areas exceeding 25 hectares, and small/medium planter including tenant planters (or metayers). The latter category grows cane on areas varying from 0.1 to 25 hectares and amounted to total of around 20,000 hectares in 2005, with significant amounts in areas that can be considered as marginal to cane, and for agriculture more generally.

In 2006, the MSA, which conceptualised and put in place the FORIP, noted that small/medium planters operate on small plots and many of their production methods are inefficient and that they suffer from a host of adverse factors, the salient ones being[3]:

- Their land is neither prepared for mechanisation (either partial or complete) nor is it ready to benefit from economies of scale;
- Inappropriate cane varieties are cultivated and, on account of high replanting costs, there is a large occurrence of old and low yielding canes;
- Canes are not always harvested at the optimal time, resulting in lower sucrose content and, when harvested, are very often not immediately processed due to delays arising out of problems related to the transport of the canes to the mill and cane delivery quotas. These factors cause a substantial loss in sucrose;
- The high costs of cutting, loading and transport of the cane due to diseconomies of scale, coupled with the hassle represented by the organisation of the harvest, act as factors inducing planters to abandon cane cultivation.

In this regard, a Field Operations and Regrouping and Irrigation Project (FORIP) was designed with the objective of modernising and upgrading the production set up of small and medium planters so as to enable them through enhanced production and lower costs to withstand the shocks of the future.

According to the MSA, operation in large units coupled with efficient management would, after de-rocking, even the coarse one, mean 2-3% extra land to cultivate, at least 10-15% increase in cane yield due to better varieties and improved cultural practices, and at least 5-7% increase in sugar recovery on account of timely harvest and delivery of cane to the mills. Sugar yield would thus increase by 20% on a conservative basis. Furthermore, production cost can be reduced by at least some 20-25%. Results from Phase I of the FORIP substantiated

[2] Medine does not have many non-corporate planters and not many co-ops operate in their region, although one co-op located in this region is currently preparing for certification.

[3] Notes of late Khemnarain Baguant

these assumptions. Hence this approach was deemed to be a fitting response to the substantial price decrease envisaged as a result of the 2006 reforms in the EU. The proviso was that the management of plantation is done in a more professional manner, matching that which the corporate sector and the key institutions can achieve.

The promise held by the FORIP is summarised in Table 6.7.

Table 6.7: Example FORIP Yield Data

FORIP site	Region	Pre-scheme Yield (tonnes/hectare)	Post-scheme Yield (tonnes/hectare)	Increase (%)
Albion[1]	West	61	118	92
Queen Victoria	East	80	100	25
St Julien D'Hotman	East	90	142	58
Point-aux-Piments[2]	North	50	112	124
Bon Air	North	80	100	25
Esperance	Centre	60	82	37
La Cure	South	57	80	40

Notes: 1. Fields previously irrigated, but new automated system installed by FORIP.
2. Fields not previously irrigated; new automated system installed by FORIP.

Source: MCIA, September 2014

Out of the 20,000 hectares, some 15,000 hectares would ultimately be covered by the FORIP. Upon completion, the 15,000 hectares were expected to yield an incremental cane production of some 400,000 tonnes i.e. some 45,000 tonnes of sugar. Bagasse from the incremental cane would enable the generation of 50 GWh of electricity and the production of 12,000 tonnes of molasses i.e. 3 million litres of ethanol.

In addition to the economic and financial benefits, the FORIP also offers technical assistance on soil improvement and cane varieties which have social and environmental benefits.

Being a novelty in the Mauritian context, it was decided to proceed with the FORIP in a phased manner. Moreover, to ensure maximum success, the MSA, with the approval of Government, established a Project Implementation Committee (PIC) chaired by it and comprising all the service-providing institutions of the sugar industry, namely the Mauritius Sugar Industry Research Institute (MSIRI), the Sugar Planters Mechanical Pool Corporation (SPMPC), the Farmers Service Corporation (FSC), and the Irrigation Authority (IA). In addition, MOFED and the Ministry of Agro Industry and Fisheries (MAIF) are also members of the PIC. While the MSA defined policy and disburses funds, all operational matters were decided upon by the PIC.

In reality, as from 2009, the FORIP deviated from its original purpose and was involved only in coarse land preparation and regrouping was no longer a priority. As a result, planters are still from attaining a status where economies of scale are possible and mechanisation of harvesting is still distant. However, planters that have jointed the FORIP have access to the Planter Harvest Scheme, which we discuss below, to assist them with the acquisition of machinery.

Nonetheless, a sense of commitment is shown by a planter joining the FORIP. Under the FORIP, a planter who signed up to be part of the programme agrees to continue their land in cane for a 7-8 year cycle (after which the cane will need replanting due the yield dropping beyond the point of being profitable).

6.3.4 Other forms of assistance to small and medium planters

There are several other schemes and arrangements targeted to small and medium planters, some of which are linked to participation in the FORIP.

Planters Harvest Scheme

When it began, the Planter Harvest Scheme had a budget of MUR100 million and, in 2013, this was increased to MUR300 million. It originated as a fund to invest in harvest mechanisation. Loans can be taken out at a low interest rate to buy machines. The planters, millers and contractors take out the loans jointly. The miller gives the financial guarantees necessary to broker the deal and the contractor must ensure he has enough planters to join the scheme to justify the purchase and use of the machinery. Although this scheme is deemed successful by the users, it can only help farmers that are regrouped under FORIP or in Block Farms.

Cane cultivation agreements

Another route to assist small/medium planters is via cane cultivation agreements, whereby the corporate sector undertakes part or the totality of the cane cultivation cycle on behalf of the planter. However, only limited progress has been made in this area, mainly in the East and the South of the island. Two elements constrain this process (a) the absence of a legal *cadre*, which could provide comfort to all parties concerned and (b) the reluctance of institutions to go along this route.

Matching Available Cane Lands with Available Labour

As part of the 2013 budget speech, the Government of Mauritius announced a new scheme to be run by MCIA designed to bring some of the abandoned land under cane. They encouraged anyone with land that they currently were not able to work and those who wanted to use their labour to work cane fields but didn't have land, to apply for the scheme. A legal framework was put in place to encourage leasing of land and the MCIA formulated a lease agreement for those taking advantage of the scheme. In total 39 land owners, with 60 hectares of land were matched up with 160 potential lessees. Although this does not represent a huge amount of land, it demonstrates that there is another way to bring cane back into cane, and as a pilot scheme, it was successful.

A framework for maintaining small or medium planter involvement in sugar

Who is a small and medium planter? The first category comprises mostly planters cultivating less than five hectares; the second one comprises planters cultivating 5 to 25 hectares of land. The figures of the SIFB for 2013 show that 8,800 planters cultivated less than 0.5 hectares nearly 13,000 less than one hectare, 2,100 from one to two hectares. Thus, 15,100 planters were below the two hectare threshold.

Table 6.8 derives the monthly income a planter can expect to earn from a two hectare plot of cane land. This assumes that cost of production ranges from MUR11,000 to MUR17,000 per tonne of sugar, with most being towards the lower end of this range, as indicated by planter associations. It also assumes planters earn a take-home price in 2014 of MUR16,000 per tonne of sugar, based on the current expected ex-syndicate price of MUR12,500 plus MUR1,000 (inclusive of sugar, molasses and bagasse revenue and distiller-bottler contribution) plus a premium waiver and a special assistance of MUR2,500 per tonne of sugar accrued.

On a 13 month basis (12 months plus 13th month bonus payable to all employees of the country), income ranges from nothing comes to an absolute maximum of MUR4,500. In reality, most efficient planters would earn some MUR 2,000 per month, which is well below the

requirements of a family of four. It is therefore no surprise that the SIFB Report found out that there was a strong correlation between abandonment and plot size as shown hereunder (Table 6.9).

Table 6.8: Estimates monthly income from farming two hectares of cane land

Cost of production	11,000	13,000	15,000	17,000
Cane price	**16,000**	**16,000**	**16,000**	**16,000**
Ex-Syndicate price	*12,500*	*12,500*	*12,500*	*12,500*
Planter premium for by-products	*1,000*	*1,000*	*1,000*	*1,000*
SIFB assisiance & premium waiver	*2,500*	*2,500*	*2,500*	*2,500*
Profit per tonne of sugar	**5,000**	**3,000**	**1,000**	**-1,000**
Sugar per 2 hectares	9	9	9	9
Total profit	**45,000**	**27,000**	**9,000**	**-9,000**
Total profit per month (basis 13 months)	**3,462**	**2,077**	**692**	**-692**

Table 6.9: Breakdown of abandoned lands by plot size

Plot Size	Number of Plots Abandoned	% Number of plots	% Extent of Abandoned Plots
0 up to 0.5 Ha	6,979	7.5%	37.0%
0.5 up to 1Ha	2,072	21.0%	33.1%
1 up to 2 Ha	654	6.6%	19.6%
2 up to 5 Ha	162	1.6%	9.6%
5 Ha and above	8	0.1%	1.2%
Island	9,875	100.0%	100.0%

Source: SIFB Abandonment of Cane Lands, September 2011, p12.

The stark reality is that cane cultivation is no longer a major economic activity for planters cultivating less than two hectares. These planters account for 6.7% of total sugar produced and, in a situation of tight cane supply and the need to be as competitive as possible, it goes without saying that this category of planters requires a framework that would allow them to remain in the business directly or indirectly.

The Framework

A framework to maintain small/medium planter involvement in sugar comprises several elements:

1. Enhanced sugar price through more remunerative marketing and value addition agreements at industry level;

2. Additional revenue from molasses and the distiller-bottler contribution and from bagasse and biomass at industry level;

3. The US$60 premium per tonne of Fairtrade sugar;

4. Dividends payable to active , as opposed to dormant , planters;

5. Value addition at local level by planters in the context of SMEs.

6. Revenue can also increase if cultural practices are improved and canes are harvested at the optimal time.

Points 1, 2 and 3 are dealt with in other parts of this section.

Higher dividends / SIT

The Sugar Investment Trust (SIT) was established in 1994 as part of a deal between Government and the MSPA whereby the SIT would be entitled to 20% of the equity of all milling companies that would become public companies. In line with the recommendations of the BEDP, the SIT also became a shareholder of the independent power plants (IPPs). As a result of a deal in 2001 between Government and Mon Trésor Mon Desert, SIT is entitled to 24.5% of the economic interests of Omnicane.

Shares of the SIT were put on sale to the relevant categories of planters and employees. Adverse political publicity led to a poor response from planters, while employees, who are more dependent on the sugar activity, willingly acquired shares. Unsold shares were taken up by the corporate underwriters who now hold some 35% of the shares of the SIT. Employees hold 41% and planters the remaining 24%.

In 1994, there were 35,000 planters and some 30,000 employees; numbers have since dwindled to 16,500 and 8,000 respectively. It is safe to say that active planters hold around 10% of the shares of the SIT and current employees around the same amount.

In December 2007, Government and the MSPA signed a deal which *inter alia* provided for an increase in the equity held on behalf of planters and employees from 20% to 35% in milling companies, refineries and distilleries and from 10%-20% to around 30% in IPPs.

Shares have been acquired only in the case of one refinery but as the vehicle to hold the shares and the modalities of acquisition of shares by employees and planters has not yet been resolved, a warehouser, a subsidiary of the State Investment Corporation, currently hold these shares. Funds from under the Accompanying Measures have been used to purchase equity. Provision has also been made for the acquisition of new shares.

If the new shares are allotted solely to active planters and employees, the dividend payable per planter/employee would become meaningful. For example, if MUR100 million accrue as additional dividends and are equally divided between planters and employees, small and medium planters would obtain MUR625 per tonne of sugar for 80,000 tonnes of sugar. Any one of the remaining 7,000 employees would on his part receive the equivalent of MUR 7,200 per year or MUR 900 per month.

The stream of additional revenue/dividends which adds up to the net revenue is expected to greatly improve the profitability of planters. Moreover, the possibility for planters and employees to redeem their shares in the SIT is expected to provide another means for these stakeholders to secure funds when needed.

Value addition at SME level

SMEs not involving planters have evolved over time and are engaged in many niche activities concerning the use of sugar, cubes, addition of spices, sugar figurines and even cane juice.

Queried about these possibilities, which can be quite profitable in a country receiving nearly one million tourists, planter associations were quite lukewarm. Nonetheless, some individual planters did express the wish to engage in such activities. This can be a promising line of activity.

Recommendations

In addition to the recommendations made elsewhere in this section, boldness and innovation in respect of the small and medium planters call for different paths. These can be separated into two planter groupings:

- The Fairtrade Initiative;
- Different relations between planters and millers and loading zones.

Fairtrade planters

Of the existing 15,500 planters, 50%, in particular the smaller ones, are members of single purpose cooperative societies termed cooperative credit societies, and the sugar and related proceeds of the rest are credited directly to their bank accounts. The Fairtrade Initiative commenced in 2007 by the MSS involves some 5,000 planters and relates to the export of some 22,000 tonnes of sugar. However, the market for such sugars is limited and this constrains further participation of other planters.

- The Fairtrade planters adhere to good governance and social and environmental norms and their practice is yearly scrutinised by international bodies. This category of planters has a commitment to the sugar sector and incentive measures should be targeted to them in the first instance.
- The second priority should be those planters that wish to participate in the initiative but cannot do so given market limitations. They should also be entitled to the incentives.

Non Fairtrade planters

For the remaining 50% of planters, a lean and effective framework allowing for voluntary and negotiated contracts between planters and millers should be put in place. This was proposed in 2006 but was rejected by many Government politicians and planter representatives who argued strongly against it and the idea was shelved. The idea in a different form came back in the early 2010s but was spearheaded by the MCIA and institutional intervention stifled the move.

The setting up of the new framework and its full operation is expected to take a few years.

6.4 Environment & Social

6.4.1Environment

The environmental situation in regard to the sugarcane industry on the island has significantly improved since 2006 as a result of the implementation of various measures under MAAS, not least the enhanced resource efficiency and pollution controls that have been introduced through the rationalisation and centralisation of factory operations. However, there is progress still to be made in some areas; for example the installation of modern pollution abatement equipment needs to be completed at all of the remaining factories, and there are further opportunities to improve and maximise the energy recovery from bagasse through the commissioning of new plants and the use of more energy-efficient technologies. These issues will be addressed as MAAS implementation continues and so are not discussed further here.

However, there are some issues that have either emerged or grown in significance from an environmental perspective during the implementation of MAAS, and which may require a renewed focus and potentially additional mitigation that is not already foreseen in the strategy, as follows.

- In relation to the environmental impacts from the conversion and frequent abandonment of cane land, the most effective mitigation will be to halt and potentially reverse this decline through measures to strengthen and support well managed smallholder farming via continued efforts under FORIP and Fairtrade, as described

elsewhere in this report. Moreover, this should be coupled with measures to identify and where possible consolidate grouped production in the most suitable and amenable agricultural land, thereby maximising production efficiencies and reversing the fragmentation in agricultural land-holdings that has occurred. Mechanisms to achieve this might include agricultural land registration programmes to match farmers with unused plots (coupled with the development and promotion of standard leasehold agreements that encourage such partnerships), or through more direct land-swop deals that could (if necessary) be supported via tax reliefs or other subsidies that are designed to support sustainable land management (see also 'difficult areas' measures below).

- In addition, the publication and sharing of 'agricultural suitability' and target production area maps and GIS-based tools with the planning authorities, and the more direct coordination with these authorities in general (and additionally with the environmental and parks authorities), would enable the more effective zoning of development across the island. If this zoning is further enshrined in legislation then this may serve to reduce speculative holding of agricultural land that is constraining its use for production purposes, in addition to stemming the practice of agricultural sub-division in general.

- With regard to the unsuitable or unsustainable land-use practices, the above measures would benefit this issue through agricultural zoning and the consolidation and dissemination of good practices for sugarcane farmers, i.e., via FORIP and Fairtrade etc. However, further measures to support agricultural best practices outside of sugarcane are required. In time these sectors will achieve this through the gradual uptake of product certification schemes (including Fairtrade); however, in the short-term support will be required from agencies such as the Chamber of Agriculture and agricultural research bodies and extension services such as AREU; for example to develop and disseminate horticultural codes of practice such as those produced by APEXHOM (the Professional Association of Producers/Exporters of Horticultural Products from Mauritius). This support could be initially targeted at reservoir catchment areas where existing eutrophication problems have been identified (e.g. the Midlands/Nicolière reservoirs to the east of Port Louis).

- Accepting that sugarcane production is likely to continue to decline in some of the more marginal and 'difficult' coastal lands in the south-west and south-east of the island, measures to support continued soil conservation in these areas are paramount. These could include the aforementioned re-location or land-swap arrangements to match land-holders that wish to remain active in sugarcane with more agriculturally commercial land in the interior (with environmental subsidies used to facilitate this if required). Their marginal land could then be re-purposed to ensure soil conservation through other sustainable economic uses such as forestry (e.g. Eucalyptus) or other biomass crops (e.g. Miscanthus) for co-generation fuel sources, or for deer ranching or natural forest for eco-tourism etc. Alternatively, these activities could be encouraged through the collective efforts of existing land-holders in these marginal areas in schemes akin to FORIP, supported for example by climate change adaptation based subsidies where biomass crops are involved.

- In relation to cane burning, further re-grouping and mechanisation within the future industry should result in continued improvements as the industry's 2001 code of practice is enforced more widely among corporate and re-grouped farmers. This momentum needs to be maintained as MAAS financial support (and the associated KPI for reduced burning) is withdrawn, particularly in relation to newly grouped farmers that may feel pressure to increase harvesting efficiencies in their early years. In relation

to uncontrolled burning, the introduction of financial penalties for burnt cane (as is practised in some countries) is not a realistic option given the difficulties of policing and the widespread collateral damage caused by accidental burning. Instead, raising awareness through increased sensitisation and education of farmers is a more practical approach, and one that can be combined with the extension services provided through FORIP and Fairtrade etc.

- Finally, the industry needs to prepare itself for proposals within the Master Plan for the Development of Water Resources in Mauritius (2025-2050) to introduce a more resource efficient and equitable system of water rights in Mauritius, based upon differential water pricing for volume of use and factors such as water scarcity, socio-economic benefit etc. As a result the relative economies of different irrigation systems are likely to change, i.e. the pricing mechanism would likely favour a move towards more resource efficient irrigation systems particularly in the drier parts of the island. This will require a continued move towards drip-fed irrigation throughout the industry, e.g. as supported through FORIP, and the promotion of the most durable, cost-efficient technologies (e.g. drip lines). The finance for such measures could be raised through an extension of initiatives such as the 'Planter Harvest Support Scheme' to cover purchase and leasing of in-field irrigation equipment, such as drip lines, pumps etc.

With these measures and the existing planned activities under the MAAS it is envisaged that the sugarcane industry can continue to provide a significant contribution to environmentally sustainable economic development in Mauritius.

6.4.2 Social

The MAAS included at its heart a range of measures to address the social impacts of restructuring the sugarcane industry in Mauritius, in particular the closure of mills and the resizing of the workforce. It aimed to both support the livelihoods of those who were made redundant in this process, and strengthen the livelihoods of small planters still working in the industry in an attempt to halt the increasing trend in land abandonment by small farmers.

Measures which have been particularly successful in helping to address some of the challenges faced by small planters in the sugar cane sector are FORIP, the Fairtrade Initiative, the Planters' Harvest Scheme and cultivation agreements between planters and millers (such as use of extension services).

The FORIP scheme is due to come to an end in 2015 but urgent support is required to continue to re-group, irrigate and mechanise as many small farmers as feasible. Re-grouping allows farmers working small fragmented plots to take advantage of economies of scale and reduced costs of production, especially during harvesting periods. The Fairtrade initiative has also breathed new life and pride into the industry and needs continued support by the industry to further its positive impact on sustaining livelihoods of small planters. Further support is also required for initiatives such as the Planter's Harvest Scheme that promote assistance through the extension of credit or technical services to small farmers and which enable the industry to capitalise on the benefits of establishing closer working relationships with all parties in the cane production process.

The key measures going forward which have potential to secure the livelihoods of this group of farmers are therefore as follows.

Expansion of the Fairtrade (FT) initiative to include all small planters:

- Small farmer incentive schemes should be specifically targeted to FT planters. Incentive schemes should reward small farmers aiming to implement international environmental and social standards to their production activities, with a view to becoming Fairtrade certified;
- FT accreditation should work in concert with re-grouping schemes. Although Fairtrade is only open to small farmers, cooperatives are encouraged under FT and re-grouping does not detract from the fact that land is still owned by individual small farmers although it is worked collectively to achieve economies of scale;
- Investigate larger markets/trade contracts for FT sugar to enable an increase in FT sugar quotas therefore facilitating more cooperatives to join the scheme;
- Put measures in place (such as reserving a percentage of the FT premium) to ensure the FT scheme is self-sustaining and can pay the accreditation fees for new cooperatives that join in the future.

Continuation of regrouping and mechanisation schemes:

- Continue to prioritise re-grouping of small farmers to enable the possibility of mechanisation; and extend schemes such as the Planter Harvest Scheme to encourage this re-grouping;
- Continue and incentivise the scheme to match up those with land with those willing to work the land, with the aim of making it attractive for those with abandoned land to bring it back under cane.

New cultivation agreements between planters and millers in recognition of the new relationships required to face the challenges still facing the industry:

- Investigate the feasibility of Millers/Sugar Cane Clusters taking over some of the services offered by FORIP after the end of the scheme in 2015;
- Devise a framework for direct contracts between planters and millers to cover all issues related to the cane cycle, such as planting, harvesting and transport;
- Extend credit services for replanting after conclusion of the cane cycle, this could be through cane clusters, commercial banks, or micro credit schemes.

In the past incentive schemes have been open-ended. However, in a context where resources will be scarce, it is necessary that, as from 2017, all incentives be attached to schemes, such as the Fairtrade scheme and schemes purporting to decrease costs and increase yields.

In summary, if the above measures are put in place, the small cane producers of Mauritius have an opportunity to take a unique place in the global market place by producing Fairtrade special cane sugars to extremely high social and environmental standards. They could set the benchmark for other sugar industry players. The structure of the industry in Mauritius favours the type of small farmer that is eligible for Fairtrade status which may not be the case in other sugar producing nations that are increasingly moving towards having predominantly large mechanised corporate producers who are not eligible for Fairtrade accreditation. This is a real opportunity for Mauritius to capitalise on its strengths of high social and environmental standards and a system that looks after the livelihoods and futures of its small planters.

Structuring new voluntary agreements between planters and millers, in recognition of their mutual need to work together to address the challenges they both face could give another opportunity to lessen the potential social impacts of loss of livelihoods for small planters in the future.

If the measures suggested for continued re-grouping and mechanisation of the harvest are implemented it will help to secure a liveable income for small farmers through reducing their costs of production. Continued modernisation and competitiveness of the cane industry will also begin to attract the younger generation to the cane sector if they see opportunities for growth and innovation rather than witnessing the steady decline of recent years.

6.5 Institutions

The TOR requires recommendations for the re-engineering of sugar institutions. There are three main institutions in the sugar industry, the MCIA, the SIFB and the MSS.

6.5.1 MCIA

Origins and current structure

The MCIA is the outcome of a merger of six institutions and the MCIA Act has taken on board the provisions governing these institutions:

- *Mauritius Sugar Authority* (MSA), engaged in policy formulation and project implementation.
- *Mauritius Sugar Industry Research Institute* (MSIRI), engaged in research.
- *Mauritius Sugar Terminal Corporation* (MSTC), operating the bulk terminal.
- *Sugar Planters Mechanical Pool Corporation* (SPMPC), catering for mechanical work mainly for small and medium planters.
- *Cane Planters and Millers Arbitration and Control Board* (CPMACB), engaged in the determination of the accruals of sugar and by-products to planters and millers, and arbitration of disputes between concerned parties.
- *Farmers Service Corporation* (FSC), engaged in extension work and projects for small planters.

The MCIA operates with four segments:

1. A general one that has taken on board the staff of the ex-MSA and the MSTC.
2. One that has operational and board autonomy and has taken the activities of the former CPMACB.
3. A third that deals with research and replaces the former MSIRI and has a Research and Development Committee.
4. A fourth, which deals with the activities of the former SPMPC and the FSC.

The MSA has been deeply engaged in a series of policy issues and project implementations, including bagasse development, FORIP, employee schemes, international trade. Of these activities, only the FORIP and some employee schemes remain and are expected to end in 2015.

Costs and income

Prior to its creation, the expenditure of these institutions stood at some MUR550 million. Following its establishment, the MCIA implemented a voluntary retirement scheme, which was different to that for the employees of the producer sugar sector, and 50% of its staff availed themselves of this opportunity. MCIA estimates its recurrent costs in 2014 (excluding capital expenditure and FORIP) will be approximately MUR 600 million.

MCIA's largest source of income derives from a global cess on ex-MSS proceeds. In 2010, provision was made to limit the cess to 4% of ex-MSS proceeds. This means that its income depends on the level of the ex-Syndicate price and total island sugar output. The evolution of the global cess is summarised in Table 6.10 and includes a projection for the 2014 crop, based on the MSS's current projection of the ex-Syndicate price and expectations for sugar output.

Table 6.10: Evolution of the global cess

		2011	2012	2013	2014
Ex-Syndicate sugar price	MUR/tonne sugar	16,020	17,573	15,830	12,500
4% contribution to MCIA	MUR/tonne sugar	641	703	633	500
Production of island sugar	tonnes	435,310	409,200	404,714	415,000
Cess	MUR million	279	288	256	208

Note: Total value of cess declared by the MSS in each year differs very slightly from the totals calculated in this table using.

In addition to the cess, MCIA charges tractor rates, albeit at highly subsidised rates, which is estimated to have generated around MUR150 million in 2014, and approximately MUR100 million from a levy on local sugar sales, which are then used to pay pensions in relation to the former dockers of the sugar industry. The MCIA also receives funding from Government to meet the cost of the FORIP.

Table 6.10 illustrates the declining value of the cess and illustrates that, even allowing for MUR250 million that MCIA generates itself plus the levy on local sugar sales, revenue will fall well short it its costs in 2014. Against this background, and bearing in mind the urgent need to limit the erosion of planters' and millers' incomes, the future role of the MCIA and its institutions must be addressed as a matter of priority.

Future role of institutions

Mauritius Sugar Terminal Corporation (MSTC)

The MSTC is no longer fulfilling its past activities and it would be more appropriate to merge the Bagged Sugar Storage and Distribution Co Ltd (BSSDC) with the MSS rather than the MCIA. The activities of the BSSDC are linked to that of the former institution and it would make business sense for them to merge or team up.

We recommend that the activities of the MSTC are merged with BSSDC and fall under control of MSS.

Sugar Planters Mechanical Pool Corporation (SPMPC) and Farmers Service Corporation (FSC)

Funds for the FORIP, some €80 million, came from Government using disbursements made by the EU under Accompanying Measures. The last tranche of these Measures has been received by Government. Implementation of the FORIP has been the responsibility of SPMPC.

However, the FORIP has not undertaken its main objective, namely to regroup planters into units where economies of scale could be attained and to facilitate full mechanisation. These measures are crucial for the preservation of land farmed by small planters when labour will be increasingly expensive and, more importantly, less available.

Once the FORIP has been completed, SPMPC should be wound down. In its place, it would be more appropriate for new arrangements concerning regrouping and upgrading of planters' lands should be worked out directly between planters and the corporate sector. The former have every reason to optimise their assets to contain costs, while the latter require a critical mass of canes for their factories. In other words, the clear commercial imperative on both sides should be allowed to dictate future investments in this area.

This commercial imperative should also underpin relations between millers and small planters with regard to extension services, which are currently the remit of the *Farmers Service Corporation* (FSC). To varying degrees milling companies have already developed extension services with small planters.

We recommend that the winding up of the SPMPC and FSC to be replaced by commercial interactions between small planters and millers.

Cane Planters and Millers Arbitration and Control Board (CPMACB)

The CPMACB is the oldest of the sugar institutions and performs certain key functions, namely cane testing and sugar analysis with a view to determining product apportionment and arbitration of disputes.

The cane testing activity is costly and could be undertaken on a large scale when the industry could fund them. However, in times of scarce financial resources, ways must be found to reduce them, while at the same time ensuring planters retain an incentive to maintain, or improve, cane quality.

One way to do this would be to rationalise the number of cane reception centres, which are a legacy of the mill centralisation programme. Some centres receive very little cane and are therefore very costly to maintain. Mills should be allowed to reduce the number of centres where it makes commercial sense to do so, and be allowed to make new arrangements with affected planters.

Arbitration being a key element in the proper working of a system, it would be useful to maintain this activity.

We recommend the streamlining of CPMACB's activities to reduce its cost. Closure of the smaller cane reception centres should play a key role in this, which would also lower the cost burden of cane reception centres to them.

Mauritius Sugar Industry Research Institute (MSIRI)

Large parts of the EU sugar beet industry will soon be at par with Brazil in terms of cost of production. This achievement is due to many factors and one of the most important is the gain in sugar yields per hectare as a result of significant improvements in varieties. Réunion Island has made substantial leaps in the development of high biomass canes, again thanks to research. Research is thus a cornerstone of long-term commercial competitiveness.

Mauritius followed the steps of Java and was among the first sugar cane countries to have organised research on sugar with the creation of the Station Agronomique in 1893. In 1928, the Sugar Cane Research Station came into being. All through these years, Mauritius had to reckon with world market prices.

In 1951, the Commonwealth Sugar Agreement, with its remunerative price provisions, came into force and two years later, in 1953, the MSIRI was established with producers having to fund the costs of research. For decades the MSIRI was an icon in sugar cane research and the industry was able to bring under control and eradicate, as the case may be, major diseases due to the strength and soundness of its research policies. For instance, Mauritius is quite unique in that fungicides and insecticides, which are highly remanent, are minimally used.

This limited recourse to pesticides is a plus point in the endeavours of the Mauritian sugar industry to render it as environment friendly as possible.

Notwithstanding these achievements, producers, concerned about the growing competitiveness gap with EU beet producers, have unambiguously voiced their feeling regarding what they consider as lack of progress in varietal improvement in Mauritius. The complaints of late are that the varieties released by the MSIRI are below expectations and fare worse than varieties developed in Réunion. The latter are of wide adaptation, whilst those developed by the MSIRI are generally site specific.

As for the EU and other competitor producers, the way ahead for Mauritius resides in new marketing ventures but equally in significant progress in research. This is an inescapable feature and producers need this vital support in the current challenging times.

Some MUR90 million are devoted to the MSIRI, of which about MUR13 million are devoted to Research and Development and MUR77 million for wages and salaries. It currently generates over MUR15 million through its activities, services, contracts, and training. Externally funded projects enable MSIRI to purchase equipment, build capacity of its staff and renew its infrastructure.

Furthermore, since the establishment of the MCIA, the MSIRI has been burdened by red-tape and public control which are not conducive to proper research. Yet the MSIRI was created to ensure the progress of the industry through research with a producer led Board of Directors, attractive conditions of service to retain the best brains and minimum administrative procedures.

A vivid example is the lengthy process that now occurs before a Memorandum of Understanding for the exchange of genetic material is executed. Such an exchange has taken place over decades and will continue as this is an important element in varietal research and for phyto-pathological considerations.

Formerly, the process was simple and involved the research stations concerned. Since the establishment of the MCIA, the expeditious and simple process has been replaced by a lengthy and complex process. The Memorandum of Understanding is first prepared by the research department of the MCIA. It then goes firstly, to the State Law Office, secondly, the Research and Development Committee of the MCIA, thirdly, to the Board of the MCIA and, finally, to the Ministry.

Some producers contend that it is not a requirement that every sugar producing country has its own research station. They believe that, if they have to pay a royalty for imported varieties, the sums to be paid would be far less than the current cost of the MSIRI, nearly MUR225 per tonne of sugar. However, it is worth noting that any introduced variety is not automatically exploitable and has to go through a field selection process to determine its suitability, zone of adaptation, agronomic characteristics, diseases and pest resistance. Such field activities normally represent more than 80% of the cost of variety development.

The producers are concerned that the current environment is not conducive for research and they entertain the worst fears regarding the development of cane varieties and the response to their needs.

The creation of the MCIA has also resulted in the staff of the former MSIRI, and indeed of the former MSA, being brought to the fold of the Pay Research Bureau. The mission of the Bureau is to define the terms and conditions of the civil and parastatal sectors which it does very well.

However, the Bureau is not best placed to assess research; the more so in what is going to be a highly competitive world. For instance, a basic nine to sixteen hours work schedule coupled with allowances paid if a staff member works before or after hours is in total contradiction with the spirit that has presided over the creation of the MSIRI.

Most producers are clear in their opinion that there should be a far-reaching reform of MSIRI with a view to streamline its activities, strengthen the collaboration with the lean and efficient research station of Reunion, respond expeditiously to the needs of producers and, last but not least, focus on sugar cane and avoid flimsy research as exemplified by the statement of a representative of the former Research and Development Committee to the effect that the MSIRI could undertake tests for the Chikungunya disease.

The days of glory of the MSIRI were characterised by three elements:

(a) A producer led Board whose focus was on sugar cane research;

(b) Full operational autonomy with minimal red tape;

(c) An appropriate remuneration package to attract and more importantly retain competency and talent.

None of these conditions exist today. The implementation of far-reaching reform, including an attractive package, has cost implications and should be assessed to decide on the right approach to ensure that MSIRI remains a centre of excellence.

It is of note that the MSIRI is the leader in the ACP Sugar Research Programme (ACP-SRP) with the implementation of eight of the 13 projects and that significant scientific results have been obtained to date including the field of variety improvement with the identification of molecular markers associated with high sucrose and early maturation.

We recommend there is a process of consultation among planters and millers to review MSIRI's functions and how best to partner with local institutions like the University of Mauritius and other research centres in the region, in particular Réunion. The objective should be to streamline MSIRI's operations and substantially review its costs allocation by:

(a) focussing its efforts on areas where it has a comparative advantage over other research centres;

(b) attracting and retaining talent; and

(c) eliminating any duplication of effort with regional centres.

The ultimate objective of this process should be a lean, efficient, up to date, producer-funded and led research centre. Additionally, in a context where the focus would also be on the optimal development of cane biomass, such a research centre would be an asset for the producers and the country.

The new institution requires a different board structure and a different *modus operandi* significantly departing from the current MCIA-led MSIRI.

6.5.2 SIFB

Costs and funding status

The SIFB employs some 135 persons costing MUR100 million in 2013. There are two ways of assessing the running expenditure of the SIFB: (a) compare this expenditure to premium collected or (b) compare it to interest earned on investments.

- A comparison with premium collected is currently fruitless. This is because the Report of the Consulting Actuarial Firm (CAF) of the SIFB has recommended that there should be a waiver of the premium for the 2014 and 2015 crops. The CAF also recommends the payment of special assistance of some MUR2,000 per tonne of sugar.

- A comparison of SFIB's costs with interest on investments for calendar year 2015 shows that running expenditure will exceed interests earned. The reason for this is that some MUR850 million will be drawn down from SFIB's investments to pay the special assistance. It has been a long time since such a situation occurred. Moreover, the additional special assistance envisaged for the 2015 crop will further depress interest earned and widen the deficit regarding running expenditure.

Against this backdrop, there is a strong case for streamlining of the SIFB.

Special assistance measures (2014 and 2015)

Until now, the SIFB has been in the business of insuring against climatic events, cyclones, drought and excessive rainfall. An Actuarial Review conducted in 2010 recommended *inter alia* that payment of compensation be triggered if island loss exceeded 25%. Island loss is computed by comparing sugar produced with the total insurable sugar.

After taking into account, new rules to compute the total insurable sugar, introduced in 2008, and the fact that cane has significantly moved away from hilly and sloppy regions as well as from very dry and rocky regions, the threshold of 25% meant that compensation would have been triggered only on three occasions from 1960 to 2013.

The recent CAF recruited by the SIFB has submitted his recommendations for the 2014 and 2015 crops. Following representations made by producers and the Board and management of the SIFB, the CAF has *inter alia* proposed two measures:

1. The first is to reduce the compensation trigger point from the island-wide figure of 25% to 17% at enlarged factory area level.

2. The second is to grant at premium waiver for the 2014 and 2015 crops along with a payment of a special assistance of MUR2,000 per tonne of sugar accrued for these two crops. As there has been no climatic event in 2014, the payment for this crop is not subjected to compensation payment. This may or may not be the case for the 2015 crop.

How will the special assistance and premium waiver system work? Based on an ex-MSS price for 2014 of MUR12,500/tonne sugar, the support mechanism would be as follows:

A. MSS price per tonne: MUR12,500;

B. SIFB premium per tonne: MUR500;

C. Take home price (A-B) per tonne: MUR12,000;

D. SIFB first proposal, premium waiver: MUR500;

E. SIFB second proposal per tonne: MUR2,000;

F. New take home price (C+D+E): MUR12,000 + 500 + 2,000 = MUR14,500.

In 2014, the SIFB would to all intents and purposes be operating a price insurance system. This is why the payment of the special assistance requires a legislative amendment, as such a system is not provided for in the Sugar Insurance Fund Act. For 2015, there would be a hybrid climatic and price insurance system. For 2016 onwards, the CAF is expected to undertake a stock-taking exercise and assess the situation based on the existing and forecast circumstances and submit recommendations.

The next four crops, 2015 to 2018, will be critical for the sugar industry as it adjusts to the upheavals on the EU scene and optimises its operational activities and streamlines its supporting institutions. In this regard, the SIFB can provide the required buffer that will allow the sector to restructure while having to cope with current depressed prices and uncertainty surrounding their future.

Capacity for the SIFB to provide special assistance beyond 2015

The total short and medium term reserves of the SIFB that can be mobilised amount to some MUR5.4 billion. The forecasted payments for the 2014 and 2015 crops would reduce the reserves by some MUR1.7 billion on the basis of crops of 425,000 tonnes, to MUR3.7 billion.

Would the SIFB be in a position to provide further premium waivers (or discounts) in excess of the current legal 50%, and pay special assistance for crops 2016 to 2018?

At rate of MUR2,000 per tonne of sugar that is envisaged for the 2014 and 2015 crop, special assistance for a crop of 410,000 tonnes represents some MUR820 million. If these amounts were to be paid out for the 2016 to 2018 crops, alongside premium waivers, it would require a further MUR2.46 billion to be drawn from the SIFBs. This would leave MUR1.2 billion, just enough to cater for the 2019 crop assuming a similar level of special assistance. Thereafter, the SIFB's reserves would have dried up and would have to be wound up.

SIFB – a new potential role

The SIFB issue calls for a major policy decision in that the authorities would have to recommend to the CAF to consider the SIFB in a totally new perspective. This decision is essential as the SIFB can only act pursuant to an Actuarial Review.

The adoption of a price-support system also means a shift from climate insurance to price insurance. Climate insurance is cumbersome and requires significant personnel, whereas price insurance is just a comparison between a set of export prices and a clearly-defined target ex-MSS price and paying the difference to the extent specified. In this context, administrative costs of the SIFB can be substantially reduced. In this assessment, it will be essential, of course, for the CAF review to take into account not just price movements in Mauritius' other export markets, but also increases in the common price due to institutional re-engineering and lower manufacturing costs paid by the MSS.

The shift from climate to price insurance also implies that there would be no cover for drastic climatic events, i.e., island losses in excess of 17% of the total insurable sugar. At an island level, such losses refer to productions of less than 365,000 tonnes based on an insurable sugar of 440,000 tonnes.

Recommendations

The reserves of the SIFB provide a valuable resource that the industry can draw upon to assist with its restructuring to cope with the forthcoming reforms in the EU. The value of these reserves is all the greater given that the EU will not be providing assistance similar to the

Accompanying Measures provided as part of the 2006 reforms. However, if these reserves are to be drawn down to assist the industry adjust to its future, this will require a major change to the role that is performed by the SIFB.

Given the scale and severity of the challenges that lie ahead, we recommend that the authorities review the current status of the SIFB, with a view to using its reserves to assist with the process of adjustment. An actuarial assessment would define the contours of the new system.

6.5.3 MSS

Following the 2006 reform of the EU sugar regime, Mauritius was able to withstand the dual shock of the phasing out of the Sugar Protocol and the 36% reduction of institutional prices by adopting a new production and marketing strategy that was focused on sales of refined and special sugars. Now, the industry faces formidable new challenges that may result in the loss of its preference in the EU market.

These challenges have far-reaching implications for marketing of Mauritius' sugar and will require an even greater focus on value addition, as well as a broadening of its geographical focus beyond the EU. Moreover, there are well-documented strains within the MSS' membership, with two millers having served notice to leave the Syndicate.

Against this backdrop, the industry will have to consider seriously the future role of the MSS, as well as the regulatory implications this could have for the sector more broadly.

Evolution of sugar marketing to date

In 1929, the then Chancellor of the Exchequer of the UK in 1929 modified the custom duties so that it became more interesting to export raw sugar for refining rather than white sugar for direct consumption. This led to a sea change in Mauritius and, within a couple of years, the Mauritian sugar industry shifted its production from white sugar to raw sugar that was sent for refining by Tate & Lyle.

80 years later, Mauritius took the reverse direction and moved away from raw sugar back to white refined sugar. This also meant severing the links with Tate & Lyle and concluding supply arrangements with other buyer(s). After an extensive and thorough tender exercise, MSS concluded a six-year Long Term Partnership Agreement (LTPA) in 2009 with Südzucker, the largest European beet sugar producer, for the supply of up to 300,000 tonnes of white refined sugar of specified quality for the crops 2009 to 2014.

The main feature of the LTPA was a movement closer to the market, with white refined sugar being delivered on a just-in-time basis to the final end user. The price payable was linked to the EU market price and included a profit-sharing formula that ensured the industry benefitted from part of any premium that arose if market prices exceeded the institutional price. LTPA also made provision for a floor price. The new arrangements were viewed as an improvement from previous arrangement with Tate & Lyle, when prices were linked to the institutional price.

Under the new LTPA, MSS obtained a price worked out as follows:

- EU market price: M;
- Floor price: F;
- Destination costs in the EU: d;
- Market margin: (M-F-d)= mm;

- Share to MSS: approximately 50% of mm;
- C.i.f. price to MSS = F +mm/2= C;
- F.o.b. price to MSS = C less insurance and freight.

The shift from raw sugar to white refined was also accompanied by an increase in the production of special sugars. The latter were being exported in in bags in containers and the industry chose also to ship white sugar in containers, but this time in bulk. Judicious use was made of the container hub of the Port Louis harbour and the fact that a large number of containers leaving Mauritius are empty. In terms of freight, this meant competitive rates and the combined cost of insurance and freight for white sugar was, in fact, lower than for bulk raw sugar.

Large-scale movement of bulk white sugar in containers was revolutionary and Mauritius experienced significant teething problems associated with the mode of delivery. These were successfully resolved in collaboration with the buyer, but the means to overcome the technical constraints involved additional investments at the two refineries of some US$100 million. Funds were obtained locally and from the European Investment Bank (EIB), which used the concessionary line of credit approved in May 2006 in the Joint ACP/EU Council of Ministers in Port Moresby, Papua New Guinea.

As with special sugars, the producers of refined sugar are paid a manufacturing fee by the MSS, which is deducted from f.o.b. proceeds before derivation of the ex-Syndicate price. The refining fee paid by the MSS to refiners covers not only cash operating expenses but also an element for debt servicing and this element is scheduled to phase out in time.

When the LTPA was concluded, EU market prices were on the low side and it was expected that the margin accruing to Südzucker would be in the region of €30 to €50 per tonne of sugar. The focus was then on the value addition compared to raw sugar. However, EU market prices rose considerably in the 2011 and 2012 crop years due to an exceptional combination of factors and the margin accruing to Südzucker rose to €120 and €155 per tonne, respectively. Although it is widely recognised that these exceptional market circumstances could not have been foreseen when the LTPA was being negotiated, this outcome has nevertheless been the subject to considerable debate and has left a bitter taste.

Beyond the LTPA – 2015 to 2018

The re-appearance of Mauritian white sugar in European markets, together with its high quality and just-in-time delivery, has drawn the attention of other buyers who have indicated that they could offer interesting terms of purchase following the expiry of the LTPA with Südzucker. Meanwhile, the possibilities that could exist post LTPA and the high margin that accrued to Südzucker in the 2011 and 2012 crops brought about a re-thinking by some companies. In 2012 and 2013, Medine and Omnicane, gave notice pursuant to the Statutes of the MSS of their leaving the MSS three years after the submission of the notice, i.e., from crops 2015 and 2016. Together, these two groups represent nearly 25% of the amount of refined sugar produced from originating sugars.

- Medine sugar factory produces some 40,000 tonnes, which are sent for refining at Omnicane. Sugar accruals to the Medine group (including its corporate farms) amount to some 30,000 tonnes of that sugar.
- Omnicane has a refinery capable of processing up to 240,000 tonnes and currently processes some 180,000 tonne. This includes the sugar produced in the Omnicane and Medine sugar factories, as well as some 20,000 tonnes of NOS. Excluding the NOS, the Omnicane group (including its corporate farms) has a sugar accrual of some 50,000 tonnes.

Legislation was passed in 1979 when the sugar bulk installations were set up. Provision was made *inter alia* for the Minister responsible for Agriculture to adjudicate as to who would be a body authorised to market sugar and this role was devolved on the MSS. That was done at a time when the near totality of Mauritian sugars were in the form of raws exported to Tate & Lyle for refining. In 2011, when the MCIA Act was being drafted, the 1979 provisions were carried forward unchanged.

Given these provisions, Medine requested the permission of the Minister of Agro Industry to be an *authorised body* to export sugar, but the request was turned down. At the time the decision was taken, the major upheavals in the EU market had not taken place.

Meanwhile, MSS membership has entrusted to management of the MSS the task of working out the appropriate marketing arrangements for the pre-quota abolition period and the initial year of the post quota abolition period, that is crops 2015 to 2018. To this end, the MSS has been engaged in negotiations for the marketing arrangements for white refined sugar when the current LTPA expires. At the time of writing, negotiations with two buyers had been concluded, while the third was not yet concluded.

The MSS currently disposes of some 335,000 tonnes of white refined sugar obtained from OS and NOS. From these amounts:

- One buyer will take 135,000 tonnes for four years.
- Another will take 30,000 tonnes of special sugars for four years and 70,000 tonnes of refined sugar for just two years. There will be a review in 2017 on the arrangements for refined sugar supplied beyond the second year.
- The last one is expected to take 50,000 tonnes for four years.

Outside of these contracts, the MSS will have a surplus of what may be termed *free* sugars. These sugars will be at its disposal for sale to the best performing buyer(s) of the three or to other buyers outside the EU. Assuming island sugar output remains broadly at current levels, these *free* sugars would amount to approximately 50,000 tonnes in 2015 and 2016, and 120,000 tonnes in 2017 and 2018. The change between 2016 and 2017 will arise because 70,000 tonnes will be released by the second buyer in 2017 and the MSS will be able to redirect this sugar to the two other buyers in the EU or sold elsewhere.

The future role of MSS

Successful negotiation of three new marketing arrangements for refined sugar will effectively ensure the MSS' role remains more-or-less unchanged up to and including the 2018 crop. However, the role of the MSS from the 2019 crop onwards deserves serious consideration, not least because two of its members have already served notice to leave prior to that date. Moreover, any fundamental reform of current arrangements is likely to influence other institutional arrangements, most critically arrangements between millers and planters. This means any far-reaching reforms will have to be discussed and agreed in the next 1-2 years, so that any new policies can be formulated and implemented before the start of the 2019 crop.

The views of its members

The strategy of the MSS is based on the premise that all sugar producers will consign their sugar to it. It cannot therefore ignore the views of its members and Government; nor can it ignore the fact that many views have been expressed publicly against the LTPA. There are very disparate views regarding the future role of the MSS, which range from continuation of the *status quo* to its abolition. This issue has been raised by many stakeholders during the meetings the Consultant had in Mauritius.

Those in favour of far-reaching reform have pointed out that the market for Mauritian sugars in 2019 could be quite different from today and have raised the following points:

- The MSS has a levelling approach and is not conducive to the entrepreneurial endeavours that will be required to ensure the industry adds maximum value to its sugars;
- The *filière* approach imposes different relations between a manufacturer and the end-buyer and this may include commercial confidentiality considerations and brand exclusivity;
- The EU might not be the major destination of Mauritian sugars due in particular to severe competition by beet producers. In this regard, presence of Mauritian groups on the African continent may be a better form of trade facilitation than the MSS;
- The MSS can be by-passed, as marketing and container chartering can be done at company level.

This school of thought also considers that the winding up of the MSS must be accompanied by a new planter/miller relationship whereby the planter is more fully integrated in the value chain of the mill to which he delivers his cane and the miller has greater flexibility and liberty to create value and seize all opportunities.

On the other hand, advocates of the MSS point out that, without the MSS:

- There would be increased competition on special sugars if MSS were to be abolished and the overall value of sales would come down;
- There would be no clarity on the mechanism of payment to producers;
- Mauritian companies would compete against each other.
- The MSS, through economies of scale in operations, improves efficiencies in logistics.

Criteria for judging the future of the MSS

The TOR of this study refers to the MSS and the marketing strategy on quite a few occasions. In particular, it recognises that the traditional links between ACP suppliers and beet producers established in 1975 at the inception of the Sugar Protocol have weakened. This is true especially with regards to beet sugar producers whose future strategies are to increase production, which will place them in direct competition with the ACP.

Any judgement regarding the future of the MSS must be made against a clear set of criteria. Perhaps the clearest of these are:

(a) cost — is MSS an inefficient drain on industry resources?

(b) value added — would abolition of MSS help the industry add value to its sugars?

In addition, two of its members have formally announced that they wish to leave the MSS and, if they were to be granted authority to export their own sugar, this would lead to fragmentation of industry marketing arrangement.

Costs

The MSS employs some 40 persons and had a budget of MUR85 million in 2013 (approximately 1% of industry gross revenue) that is taken from the proceeds of the sale of sugar. It is currently the sole exporting agency for all sugar producers and also the sole supplier of NOS sugar to refineries. In addition, it is a major, but not the sole, importer of sugar for the domestic market.

In the absence of the MSS, sugar would still have to be marketed and the cost of doing this would depend on the number of bodies that would replace the MSS' activities. However, there would undoubtedly be some duplication of the tasks currently conducted by the MSS and it is far from clear that there is a compelling case for the abolition of the MSS on grounds of costs alone.

Value added

In 2009, there was a need to move away from EU refiners and move up the value chain. The Südzucker LTPA was a useful vehicle to this end. The new landscape calls for further advances up the value chain. Moreover, erosion of preference in the EU means sugars that cannot command a high value added in the EU may find better value in the other markets, notably in East Africa where Mauritius has preferential access to countries within COMESA.

The key issue therefore is whether MSS provides the best vehicle for the industry to maximise value in the future. Unfortunately, it is not possible to provide a definitive answer to this question *a priori*. Those in favour of reform argue strongly that it is the entrepreneurial endeavours of producers themselves that represent the industry's best chance of maximising industry revenues in the future.

In the textile and other sectors, the company approach is the norm and has not prevented the sector from pursuing a successful strategy of increasing value. The direction of travel in other sugar industries around the world is also for greater autonomy at the corporate level. In South Africa, successive rounds of reform have devolved responsibility for marketing to sugar companies, and the Australian industry is currently moving in this direction.

Fragmentation

By refusing to grant the status of *authorised body* to any party that wishes to leave the MSS, the Government has the *de facto* power to ensure the continuation of centralised marketing. However, by doing so it is forcing some of its stakeholders to behave in a way that conflicts with their commercial instincts.

It is apparent from the Consultant's discussion with stakeholders that the desire to market sugar independently is held not only by the two companies that have formally served notice to leave the MSS. As such, it is apparent that the tensions that currently exist within the MSS' membership will only increase in the future and must therefore be addressed.

Conclusions and recommendations

Conclusions

The industry is well on its way to adding value to its sugar output. The new contracts that will supersede the Südzucker LTPA will be a further step in this direction. However, it is clear that the industry will have to move further if it is to combat effectively the changes that it will face as a result of the forthcoming reforms in the EU. There are several strands to this.

Table 6.11: SWOT analysis of role of MSS

Strengths	Weaknesses
• Joint marketing via MSS enables efficiency gains in administrative and financing costs through economies of scale.	• The MSS's levelling approach is not conducive to the entrepreneurial endeavours that some producers believe will allow the industry to maximise the value to its sugars.
• Joint marketing via MSS enables efficiency gains in logistics activities through economies of scale.	• MSS may not be well placed to create the direct relationships between manufacturer and end-buyer (e.g. commercial confidentiality and brand exclusivity) needed by the *filière* approach to add value.
• Joint marketing by MSS avoids competition between Mauritian producers.	• The presence of Mauritian groups on the African continent means that they may be a better form of trade facilitation in these markets than the MSS.
• MSS provides visibility to both planter and millers with respect to the payment mechanism.	
Opportunities	**Threats**
• The MSS could remain in activity either as is or as a platform for logistics for individual exporters. • Experience in Africa	• Absence of arrangements to replace payment activities of MSS. • Repeal of MSS altogether.

- Defend as best as possible the market for special sugars, in which Mauritius is the market leader.
- Adopting a more *filière* approach, which is a path along which the industry is moving and which one company, in particular, is keen to exploit further (and has already made investments to achieve).
- Broaden the geographical focus of sales to embrace preferential markets in East Africa, where Mauritian sugar producers are strengthening their footprint.

Give the strategic presence of Mauritian sugar companies in each of these market segments, and the declared position of some producers to leave the MSS, the future of centralised marketing must be addressed. Moreover, given the potential ramifications of the winding down of the MSS' functions — including the critical issues of purchase of standing canes, different cane pricing structures at different mills and the possibility of canes moving between mill zones — this issue must be considered a priority.

The direction of travel is clear: for the most part, millers (and the sugars they control along with their corporate farms) are looking to a world without the MSS. Ultimately, a decision to end the MSS will require not just the consent of its members, but also their support for, and trust in, those entities that will market their sugars in the future. For this reason, consultation and consensus will be needed, even if this proves difficult to achieve.

Recommendations

Industry must decide on how to market their sugars. There is a strong case to devolve the role of sales and marketing and to move to a world without the MSS. This is likely also to require a new system of payment for producers. Given that the target date for implementation of these new arrangements is 2019, the industry and Government must act soon to discuss, agree and formulate these new arrangements.

We therefore recommend that discussions be initiated regarding the future of the MSS. These discussions would also be accompanied by other discussions whereby Government and producers should also address the institutional arrangements that will be affected by this change in marketing arrangements.

In the interim, we recommend that:

- *Just as other importers are allowed to import sugar and either sell it or incorporate it in other goods, the refineries should be allowed to import NOS and produce refined sugar for the local market at their own risk.*
- *The MSS should have no exclusivity on finding markets for the so-called free sugars.*
- *Section 7 of the MCIA Act be repealed as this piece of legislation introduced in 1979 is no longer relevant in 2015 and thereafter.*

6.5.4 Re-engineering of institutions

Ideally, the institutional set-up should be lean and should not exceed 2% of the take-home price of producers for all activities now undertaken by MCIA and MSS. The SIFB is not considered as it does not draw revenue from sugar proceeds.

The ideal institution would be as follows:

- A lean MCIA dealing with, firstly, cane testing and arbitration activities and, secondly, facilitating the collaboration between planters and millers;
- The SIFB insuring for price reduction only;
- The MSS as a platform for common services with each mill undertaking its own marketing.

Such an institution would at most cost MUR120 million in 2013 terms as opposed to MUR365 million for the same year. Savings would amount to MUR245 million or MUR613 additional per tonne of sugar for a production of 400,000 tonnes.

The institutional reform implies a major staff and employee retrenchment and the attendant costs. As for the cess reform, the industry could seek a concessionary loan from Government to be serviced by savings due to lower costs. Effective additional revenue is expected as from the 2018 crop.

The former Mauritius Sugar Authority (MSA) had a lean board made up of five members all of them in name and having wide experience and expertise in the sugar industry. Two of these members were from the private sector, two from the public sector and the PS of the Ministry of Agriculture/Agro-Industry as chairperson.

This board functioned well and allowed the MSA to steer clear major reforms in the sugar sector, the Sugar Sector Package Deal, the Sugar Industry Efficiency Study, the Phasing out of Sugar Estate Camps, the Bagasse Energy Development Programme the sugar reforms of 2001 and 2007;as well as actively participate in the ACP and WTO negotiations.

The current board of the MCIA is vested interest based and would be totally inappropriate to implement the major measures needed to enable the sugar industry to withstand the formidable threats ahead.

A new MSA type board is a sine qua non condition for success. The MSA was efficient and effective as it had the same board, operational flexibility and the remuneration structure as explained in the case of the MSIRI. The lean MCIA should be organised accordingly. As pointed out in the sub-part on Employment, there is need to reinstate the Advisory Council which existed under the MSA Act.

6.6 By-products

6.6.1 Molasses

As from 1983, 100% of the molasses obtained from canes accrue to planters. Up till 2012, out of a production of approximately 125,000 tonnes, some 40,000 tonnes of molasses were used to produce potable alcohol for the domestic and export market and the rest was exported.

The revenue derived from molasses is obtained after blending the price for exports (expressed on an ex-factory basis), with that paid by distillers engaged in the production of potable alcohol. In 2013, the blending price also took on board the fob price payable by Omnicane Ethanol. The premium and compensation mechanism of the SIFB involves a price for planters where the sugar equivalent of the molasses price is added to the ex-MSS sugar price. For 2013, the total value of molasses per tonne of sugar amounted to MUR885 for all planters. Of this:

- The sugar equivalent of the molasses was MUR 615 per tonne of sugar.
- In 2010, a levy of MUR20 per litre of absolute alcohol was imposed on all potable alcohol used by distiller-bottlers for the home market with the proceeds payable to planters through the MSS. On an average, 4.25 million litres of absolute alcohol are concerned and the overall revenue to planters amounts to MUR85 million or MUR270 per tonne of sugar.

The entry into operation of a distillery at Omnicane has modified the landscape in that the new distillery has the capacity to absorb all the molasses that is exported. This distillery currently produces hydrous ethanol, which is currently exported. Omnicane Ethanol would be able to erect a dehydration unit to produce anhydrous ethanol once a policy on mandatory ethanol/gasoline blending is adopted.

On 9 December 2011, the CPMACB adjudicated that the distillery would pay the fob price for the molasses it uses. Prior to that all exported molasses fetched the ex-factory price, which for the 2013 crop was at least $10 per tonne lower than the fob price computed for that year.

2014 review of molasses pricing

The MCIA commissioned a study on molasses in 2014 and the most important task under the TOR was as follows:

> "*Taking into account the present method of determining the price of molasses payable to planters and the new environment, to work out a transparent, fair and equitable new price and payment mechanism process, with a step by step calculation methodology, and to produce an illustrative model of the methodology used. This methodology should be*

*designed in such a way **as to capture all variables down the value chain**. It should serve as a model which could be replicated and used by CAD for price determination for crop 2014.*" (Highlighting ours)

The recommendations of the Molasses Study Report comprise the following:

- The choice of the option that privileges optimal value-addition and the cessation of exports;
- Predictability in supply for distillers using molasses that refers to the equal saturation principle, reckons with *force majeure* situations and calls for the setting up of a joint MCIA/Distillers Allocation Committee;
- Predictability in price: the linking of the price of fob Port Louis molasses to a Rotterdam based price for Rectified Ethanol Neutral Spirit at 96.4% initially and the derivation of the fob price using a model based on a targeted Return on Assets(ROA) at a later stage;
- Predictability in timeframes for implementation so that all operators have the opportunity to adjust to changes;
- Increasing overall revenue through the payment of the fob price for molasses used by Omnicane Ethanol, additional contribution by distiller-bottlers in respect of potable alcohol used for the domestic market, and dividends in the case of small and medium planters;
- The Molasses Report adopts a similar line in respect of equity participation and dividends as this Report in that it calls for the payment of dividends to active planters only;
- Fostering exports of processed products and new products, similar to the value addition and filière approaches recommended for the sugar sector;
- The removal of the provision for planters to receive molasses in kind;
- Amendments to legislation.

The Report also mentions the amendment to the Consumer Protection (Prices and Supplies Control) Act in case blending of mogas and ethanol and mogas becomes mandatory.

An E10 mix would require around 16 million litres of anhydrous ethanol in the medium term. Such a production is available in the country.

Ethanol from sugar cane offers one of the best opportunities to reduce the emission of gases having an enhanced greenhouse effect as shown in Table 6.12.

Table 6.12: Characteristics of different raw materials for ethanol production

Crop	Annual yield litres/hectare	Greenhouse gas savings versus petrol %	Comments
Miscanthus	7300	37 to 73	Ethanol production depends on the development of cellulosic technology yet to be fully in the commercial set up
Switch grass	3100 to 7600	37 to 73	Ethanol production depends on the development of cellulosic technology
Poplar	3700 to 6000	51 to 100	Ethanol production depends on the development of cellulosic technology
Sugar cane , cane juice to ethanol	6800 to 8000	87 to 96	Widely used as a feedstock for ethanol production, existing technology. Some 400 million tonnes of sugar cane used in Brazil
Sugar cane, molasses to ethanol	600 to 800	87 to 96	Widely used as a feedstock for ethanol production
Sweet sorghum	2500 to 7000	Data not available	Ethanol production possible using existing technology
Corn	3100 to 4000	10 to 20	Uses existing technology, enhanced yields if cellulosic technology is used

Additionally, ethanol also fulfils a positive role in the health domain. MTBE is a substance used as an octane enhancer in mogas. It has replaced the carcinogenic lead tetra butyl ether. Although there is no clear evidence of negative health impacts, many states in the USA recommend low levels of MTBE incorporation and the US Energy Policy Act allows the substitution thereof with ethanol a renewable fuel.

What can be retained from the Molasses Report?

It is understood that the MCIA has rejected the report of its Consultant. It is considered that this report contains a certain number of valuable recommendations which have to be salvaged, namely:

(a) the cessation of exports of molasses ;

(b) the setting up of a joint MCIA/Distillers Allocation Committee;

(c) additional contribution by distiller-bottlers in respect of potable alcohol used for the domestic market; MUR 10 represents MUR 130 / tonne sugar or MUR 350/ tonne molasses;

(d) Dividend payment to active planters only;

(e) Mandatory blending of ethanol and gasoline.

Recommendations

The implementation of certain recommendations of the Molasses Report:

(a) the cessation of exports of molasses ;

(b) the setting up of a joint MCIA/Distillers Allocation Committee;

(c) additional contribution of MUR 20 per litre by distiller-bottlers in respect of potable alcohol used for the domestic market;

(d) Dividend payment to active planters only with the possibility.

The introduction of mandatory blending goes in the direction of greening the economy and reducing emissions of additional carbon dioxide. It is also expected to have a positive health impact. However, the economics and logistic aspects have to be worked out taking into account oil prices and energy security considerations. There would also be merit in exploring any possible health hazards posed by MTBE. Ethanol is known to fulfil the same role without any health hazard.

6.6.2 Bagasse

The Bagasse Transfer Price

The Bagasse Transfer Price in terms of studies is somewhat an unchartered territory; accordingly, this study has delved into the historic aspects with a view to better present issues and tender recommendations thereon.

Based on the provisions of the Cane Planters and Millers Arbitration and Control Board (CPMACB) Act (section 31(3)), the Mauritius Planters Association had requested Government to assign a value to bagasse used for purposes other than the production of sugar and to distribute these proceeds to them. Section 31(3) (now section 39(3) of the MCIA Act) is reproduced here for ease of reference:

> (*3*) *Where any bagasse produced at a factory in a crop year, other than bagasse used for the specific purpose of manufacturing sugar at that factory, is sold or otherwise transferred or is utilised in the production of any goods, every planter shall, in addition, be entitled to receive out of the value of the bagasse so sold, transferred or utilised, an amount equivalent to the faction represented by the quantity of canes supplied by him over the quantity of canes milled at the factory in that crop year.*

Government acceded to the request of the Association and, in the context of the preparation of the Action Plan for the sugar industry 1984/85, the concerned agencies of Government computed the value to be assigned to bagasse on the basis of the next alternative fuel, i.e., coal, and a value of MUR200 was arrived at, MUR100 for the planters and MUR100 for millers. However, provision was made administratively for only the payment by the CEB of the MUR100 accruing to planters to be distributed to them through the Mauritius Sugar Syndicate. The payment was introduced in 1985 (effective as from 1984) and was termed the *bagasse transfer price* (BTP).

A methodology was designed for the determination of the amount of bagasse used for purposes of generation and export of electricity:

(a) Intermittent producers (those who exported electricity as and when available and who were not bound to supply agreed levels of power): 360 KWh per tonne, i.e., 27.8 cents per KWh;

(b) Continuous producers (those who supplied agreed levels of power throughout the crop season): 400 KWh per tonne, i.e., 25 cents per KWh;

(c) FUEL (supplying firm power at agreed levels throughout the year): 440 KWh per tonne, i.e., 22.7 cents per KWh.

Miller members of the MSPA did not receive any payment despite it being their investments that led to the generation of surplus bagasse. In fact, the MSPA, in the spirit of compromise, accepted this administrative arrangement.

However, the World Bank had a different view and, as early as 1985, it impressed upon Government the need to review the BTP so as to give an incentive to millers exporting electricity using bagasse. In this regard, paragraph 2.31 of the World Bank Staff Appraisal Report of 5 March 1992 (Report No 10037-MAS) is quite specific:

> "*These bagasse transfer price payments determined on the basis of the total amount of bagasse-based electricity purchased and valued at the kilowatt-hour equivalent of MUR100 /ton of bagasse, have served as a "tax" at source on the sugar industry's sale of electricity. Electricity producers have, in effect, been taxed with revenues to subsidize sugar growers.*
>
> *This taxation, as demonstrated by the* ***Joint United Nations Development Program/World Bank Energy Assessment Study of 1987****, has discouraged the sugar industry from investing in expanded bagasse energy development"* (Highlighting ours)

The same report takes cognisance of the recommendations of the (BEDP) regarding the BTP and, in paragraph 2.32, noted:

> "*the Government has decided to effectively reduce the net sales tax imposed on power producers through the bagasse transfer price system. While the planter will continue to be guaranteed its share of the bagasse transfer price, presently 40 per cent, the balance earlier distributed to the entire miller-planter sector will now accrue solely to sugar mills that sell electricity to CEB. But implementation of the revised policy has not begun "*

In 1991, Government formulated the Bagasse Energy Development Programme (BEDP), which was endorsed by the sugar industry (including the MSPA), except for its recommendations on the BTP, and the World Bank. The recommendations of the BEDP on the BTP are found at paragraphs 7, 8 and 14 of Chapter 6.

The key recommendation in paragraph 7 referred to:

> *"Legislation is being amended in such a way that the share accruing to planters who are millers or directly or indirectly control or are controlled by millers be redirected to millers or power stations selling electricity from bagasse to the CEB."*

In paragraph 14, it was suggested that:

> "*The bagasse supplier will receive a price for bagasse supplied arrived at after negotiations with the purchaser. It is expected that the latter would* ***judiciously use*** *the 0.6T referred to above for the acquisition of bagasse. In addition, the bagasse supplier will benefit from* ***the incentives provided*** *for in the Sugar Industry Efficiency (SIE) Act."* (Highlighting ours).

Subsequent to the BEDP, the Minister of Finance and his colleague, the Minister of Agriculture, accompanied by the representatives of Union St Aubin and Belle Vue (which had been designated as firm power suppliers in the BEDP), proceeded to the World Bank for negotiations in respect of a Sugar Energy Development Loan (loan number 3458 MAS). It is noted in Article 3.02 thereof that the Borrower (i.e. the Government of Mauritius):

"*shall by July 1, 1992, implement a revised system for the bagasse transfer payment, satisfactory to the Bank*".

For the first time, the BTP was introduced in the statute book. Given that efficiency was being privileged, the provisions were incorporated in the Sugar Industry **Efficiency** Act and not in the CPMACB Act. Moreover, it has to be noted that section 3(2) (b) (i) of the SIE Act stated as follows: "*Notwithstanding any other enactment*". That is, section 3 (2) (b) and (c) of the SIE Act derogate from, and have precedence over, section 31(3) of the CPMACB Act.

In essence, the SIE (Amendment) Act provided that 50% of the proceeds from the BTP went to power producers of firm and continuous electricity as a rule and that payment of the BTP to intermittent power suppliers be discontinued as from 1 December 1997. 50% of the proceeds went to planters who were neither the miller nor persons who directly or indirectly controlled, or were controlled by the miller. No change was made to the conversion rates referred to above.

The SIE (Amendment) Act of 1993 reviewed the SIE Act 1988 and *inter alia* introduced two measures on: (a) the bagasse transfer price and (b) the security of land tenure of metayers. The MSPA members challenged the constitutionality of these two measures before the Supreme Court. Government won on the metayer issue but, in spite of this win, it agreed to have an out-of-court settlement with the MSPA in 1998 on the bagasse transfer price issue. It can be argued that Government, considering that it was on a weak ground on this issue, chose the compromise as opposed to the litigation route.

- The Agreement between Government and the MSPA is inscribed as Supreme Court record 47616. As is the custom in matters related to the sugar industry, the Agreement was also in the form of a package deal, one part referring to the BTP and another part to the sale of cane setts to planters.

- The out-of-court settlement was published in the Government Gazette as Government Notice (GN) No. 175 of 1999 and subsequently incorporated in the SIE Act 2001 section 13 and the Sixth Schedule.

The law specifies that there are two categories of planters:

1. One who is also the miller or who directly or indirectly controls, or is controlled by the miller;

2. Any other planter.

12% of the BTP proceeds accrue to the *first category*, amounting to MUR69 per tonne of sugar in 2013 and 38% to all the *other planters* who obtained MUR119 per tonne of sugar in 2013. *Pour mémoire*, revenue from molasses, distiller-bottler contributions and the BTP for category one planter amounts to MUR 954 per tonne of sugar and to MUR1,054 for the other planters.

In 2008, following representations made by representatives of small planters on the Board of the CPMACB, the Ministry of Agriculture directed the CPMACB to establish a technical committee to look into the matter with the following terms of reference:

a) Update the existing formulae in the 6th schedule of the SIE Act.

b) Determine the new price of bagasse for payment.

c) Study the effects of any increase in price upon electricity consumers and

d) Amend the SIE Act and related Acts.

However, no consensus could be reached at the level of the committee and the representatives of the MSPA on the committee, based on their understanding of task 6 of the Hunton & Williams (H&W) Study, suggested that the matter be brought to the attention of H&W for analysis and eventual recommendations. This study, which was jointly funded by Government and the MSPA, was conducted in 2009 and it came up with a series of recommendations, including on the price at which bagasse be sold. In this case, it adopted the same approach as the Government Agencies in 1984, namely that a comparison be made with coal. However, the two parties who commissioned the Study had wide divergences on methodological aspects of the study and the rationale of quite a number of recommendations, and the Report was never adopted by the concerned parties. Subsequently, Government and the MSPA agreed to put aside the Report.

The issue of a movement in the BTP has to reckon with developments that took place in the late 1990s.

The BEDP had recommended the setting up of bagasse/coal plants. In 1996, a Power Purchase Agreement (PPA) was signed between the CEB and Compagnie Thermique de Belle Vue (CTBV). At the time, it was the single largest project undertaken by either the public or private sector. Local banks were not keen on funding the project and recourse was had to foreign banks, with the EIB acting as a lead advisor. This was also the time of the Asian financial crisis, which invited caution on the part of bankers worldwide.

In the case of CTBV, bankers adopted the project finance mode, namely that the cash flow generated becomes the security of the project. Among the guarantees sought by the EIB and the international community was the incorporation of a clause referring to what would happen if there were a change in law. All subsequent PPAs incorporate such provisions.

For the BTP, it means that an IPP will not bear any change in rule undertaken by Government and that any additional cost would have to be borne by the CEB.

The near totality of the bagasse concerned is used for the generation of electricity, which is sold to the grid. The payment system is illustrated below; the actual mechanism has to cater for planters who are linked to millers and all the other planters:

- Electricity produced: 350 GWh;
- KWh/ t bagasse factor: 500;
- Tonnes of bagasse used: 700,000;
- Rate per tonne: MUR100;
- Bagasse payment by CEB to the MSS: MUR70 million;
- Share of power producers: 50%;
- Payment to power producers: MUR35 million;
- Per kWh: MUR0.10;
- Sugar production:410,000 tonnes;
- Planters sugar accrual %: 78;
- Planters sugar accrual: 0.78 * 410,000 = 320,000 tonnes;
- Bagasse revenue per tonne of sugar: MUR109.

The CEB as advised by the then MSA, now MCIA, forwards the relevant amount to the MSS, which then distributes it in accordance with the provisions of the Sugar Industry Efficiency Act. The sales revenue of the CEB totals some MUR14 billion and the BTP standing at 62 million in 2013 accounts for some 0.44% thereof.

Can the Bagasse Transfer Price be increased?

The total cost of electricity from the IPPs, inclusive of the BTF, currently averages some MUR3.30 per kWh, as opposed to the generation cost of the CEB of MUR5.00 per kWh, excluding administration overheads and other related costs. The CEB uses mainly high sulphur (3.5%) heavy fuel oil also containing poly naphthalenes, which is far more polluting than bagasse, which emits no additional carbon dioxide, no sulphur dioxide and has no aromatic residues.

Coal and high-sulphur heavy fuel oil prices have been significantly reduced over the last year and such reductions are expected to maintain themselves in 2015. Coal costs have reduced by some USD 30 per tonne or MUR 0.65 per KWh and high sulphur heavy fuel oil costs have come down by some USD 120 per tonne or MUR 0.9 per KWh. Overall this means savings of at least MUR 1.6 billion for each of years 2014 and 2015. This has a clear positive impact on the finances of the Central Electricity Board. Thus, the Board can accommodate higher prices for biomass.

It is understood from the Ministry of Agro Industry that, as advised by the State Law Office, there cannot be a distinction between planters in terms of the Bagasse Transfer Price.

Is the obtention of electricity from bagasse an automatic process?

The obtention of electricity from bagasse for sale to the grid depends on several factors, namely:

(a) The calorific capacity of the bagasse;
(b) The steam and electricity requirements of sugar manufacture ;
(c) The amount of energy generated from the bagasse;

The calorific capacity of bagasse is inversely proportional to its moisture content. For instance, bagasse with 42% moisture content has a calorific capacity which is 24% higher than for bagasse at 50%.

Moisture reduction is the outcome of the number of mills and of the efficiency thereof. Two decades back sugar mills were steam driven and required steam at pressures of around 20 bars. Steam is also required to evaporate water from clarified cane juice and in this case a system of multiple effect evaporators is used. Under this mechanism, one kg of steam evaporates x kg of water. X would be equal to three if there is a triple effect and five if there is a quintuple effect.

Electricity is used mainly in the cane shredders, the mills if they are electrically driven and the centrifugals.

The bagasse is burnt in boilers which at the time were low pressure ones, 10 to 15 bars, and had fire tubes. The steam was sent to turbo-alternators. Ideally in a power house not related to a sugar factory, all the energy in all the steam is converted into electricity and the turbo-alternator is said to be a condensing one. However, sugar factories need steam for sugar manufacture and a good proportion of the steam is extracted and not condensed.

The energy balance in the context of a sugar factory can be summed up as follows:

(a) Energy in bagasse: E;

(b) Energy loss in boiler;e1;

(c) Energy losses in turbo-alternator: e2;

(d) Energy extracted as steam for sugar manufacture: e3;

(e) Energy as electricity used in sugar manufacture: e4;

(f) Energy for electricity sold: E-e1-e2-e3-e4.

The power house is responsible for the generation of high pressure and high temperature steam and its efficient conversion into electricity.

However, the power house would be useless if major investments are not made in the sugar factory to save energy.

A miller can be quite comfortable and produce excellent quality sugar with steam drive mills working with steam at 20 bars, bagasse at 52% moisture, a triple effect evaporator system and batch centrifugals. In such a case, no electricity would be exported at all. Such mills would be using around 550 Kg steam per tonne of cane handled.

The investments effected by millers over time have been as follows:

(a) Introduction of diffusers in the milling house which allow savings of energy;

(b) Replacement of steam drives by electric drives for mills which require less energy and avoid the extraction of steam at 20 bars;

(c) Recourse to better mill performance and addition of new mills to reduce the moisture content of bagasse;

(d) Movement from triple to quintuple evaporator systems which economise steam use;

(e) Introducing falling film evaporators which further reduce steam use;

(f) Replacement of batch centrifugals by continuous centrifugals saving on energy.

Steam requirements have come down from 550 kg per tonne cane to 380 kg per tonne cane, this has permitted highly efficient power plants to produce up to 110 KWh per tonne cane for sale to the grid. Moisture contents of 42% and falling film evaporators can bring steam consumption to 320 Kg per tonne cane and electricity sales to 135KWh per tonne cane.

For a sugar factory like Omnicane, additional 25 KWh per tonne cane over 1.35 million tonnes of cane means 34 GWh of electricity or the avoidance of the use of 18 000 tonnes of coal. However, the current price structure of Omnicane prevents such investments.

Biomass

Bagasse costs nothing, as all the costs to produce it are met by the sugar activity. This may not be the case for high cane biomass that is not cultivated for its sugar content but for its energy content. The same reasoning albeit to a lesser extent applies to cane trash.

In this case, costs will be incurred to turn them into a combustible for power plants and new price mechanisms will have to be devised. Planters can be encouraged to cultivate high biomass canes on abandoned land.

Recommendation NEC 20 of the National Energy Commission Report calls for the establishment of a price mechanism to encourage the development of bio-energy, which includes biomass and can include cane trash. In this regard, it is worthwhile noting paragraph 141 of the 2008/09 Budget Speech:

> *"141. We will also fully explore the use of cane field residues mixed with bagasse as boiler fuel to reduce the use of coal. This has the potential of contributing up* ***to 8 percent to electricity production and would amount to about half the electricity currently supplied by bagasse****. MSIRI is working with the Mauritius Sugar Authority and power producers to optimise the use of this material. The use of higher pressure boilers is also being explored to optimize the use of bagasse and other biomass. "(*Highlighting ours)

Thus, the production of some 180 GWh of renewable energy, or the avoidance of the use of some 100,000 tonnes of coal, is at stake.

Recommendations 19 and 20 of the National Energy Commission (NEC) Report of October 2013 respectively call for a "*Review the price of bagasse for small and medium planters so that it encourages bagasse production, through consultations between the concerned parties*" and for the need to "*devise a price mechanism for bio-energy (biogas, biomass, biodiesel) that will encourage the development of bio-energy*".

While leaving the formulation of prices to an instance to be appointed, nonetheless the NEC Report mentions that "*in the case of other biomass (graminae and wood chips, local and/or imported), where all cultivation to processing costs have to be met from the kWh price, a different pricing mechanism will have to be evolved. The costs involved have not yet been determined as ventures into these forms of biomass are only starting as from 2013/14. At this stage only a range of values can be mentioned using the fact that such energy, with nil or negligible emission of SO_2 and no additional emission of CO_2, will displace coal in spreader stoker boilers but also displace the highly polluting HFO used as base load on the grid. This gives a range starting with the coal price and ending at the HFO price.*"

Burning of bagasse and biomass to produce electricity does not emit additional carbon dioxide nor any sulphur dioxide whereas both coal (0.4% sulphur content) and high sulphur heavy fuel oil (3.5% sulphur content) emit additional carbon dioxide and sulphur dioxide. Table 6.13 below shows the emissions of various sources of electricity in terms of emissions.

The case of Reunion.

Payments effected for bagasse in Réunion have been mentioned by some stakeholders. The payments are made for specific purposes and accrue to planters and millers and the ultimate contributor is the consumer.

Table 6.13: Characteristics of different sources of electricity generation

	Additional CO2	SO2	Other environmental aspects
Solar and wind intermittent	NIL	NIL	Nil
Biomass, only in crop season	NIL	NIL	Ash excellent fertiliser for plantations
Biomass and coal 50/50, (South African with low ash content and low sulphur) with spreader stoker technology Year round	555	2.1	Biomass ash as above Coal ash needs processing and can be used as a cement additive
Coal South Africa with low ash content and low sulphur fluidised circulating bed year round Year round	915	4.2	Coal ash needs processing and can be used as a cement additive
High Sulphur HFO Year round	281	15.8	Carcinogenic polynaphthalenes
Gas Year round	404	0.0024	NIL

Cane abandonment and its environment impact.

Loss in cane production has two implications from the emission perspective.

In Mauritius, on average, one hectare of cane yields some 80 tonne of millable cane. The carbon content of cane amounts to 15%. Using stoichiometric proportions one gram of carbon is equivalent to 44/12 grams of carbon dioxide. For one hectare this means the sequestration of 44 tonnes of carbon dioxide. Such a quantum is emitted when 21 tonnes of coal are burnt.

Average electricity production amounts to 85 KWh per tonne of cane or 6800 KWh per hectare. Such a production of electricity would otherwise come from 3.8 tonnes of coal. Similarly, some 640 litres of ethanol can be obtained per hectare using cane molasses.

Cane abandonment which results in loss of cane production is therefore a major environmental hazard.

Further investments

The MAAS had recommended that the power house of FUEL, now Alteo, be replaced by new and modern installations. This did not take place from 2006 to 2015.

It is time now to review the situation after the closure of Deep River Beau Champ that has increased the volume of millable cane at FUEL and progress made in trash and other biomass use. Matching the power needs of the country and the power and energy requirements of FUEL reasonably imply that there be a bagasse &biomass/coal plant of some 2x 50 MW. The exact decision depends on the requirements of the CEB and its procurement process.

Recommendations

The following is recommended:

- *The total BTF be set at MUR210 million or 1.5% of the sales proceeds of the CEB. The additional MUR148 million would be distributed solely to planters, representing an extra MUR475 per tonne of sugar.*
- *Negotiations to be held with the IPPs in respect of a quid pro quo involving their share of the bagasse transfer price and their requirements; if fruitful could increase the accruals to small and medium planters by around MUR 500 per tonne sugar.*
- *Establish new price mechanisms to favour the use of forms of biomass other than bagasse.*
- *Review the PPA of Omnicane so that it can optimise the recovery efficiency of bagasse through inter alia reducing the moisture content from 50% to around 42% and use other biomass and cane trash. Additional amounts would enable Omnicane to remunerate additional investments and the cane planters appropriately.*
- *Give the green light to what is termed the energy plant at La Baraque.*
- *Focus on the development of high biomass canes that have been developed in Réunion.*
- *High biomass cane could benefit from start in tariffs.*
- *Encourage investments in mills to save energy.*
- *A 2x50 MW bagasse& biomass/coal plant is possible at FUEL subject to the decision and the procurement procedure of the CEB.*

6.6.3 Other environmental issues

Findings on CNG, carbon capture, further use of renewables other than bagasse, the Clean Development Mechanism, the nucleus role of the Fairtrade Initiative and the use of ethanol in gas turbines have already been explained earlier.

Recommendations

The possibility of substituting coal by CNG in existing bagasse/coal IPPs should be explored and the impact on lesser CO_2 emissions worked out. Possibilities exist of importing CNG from Tanzania and Mozambique and may require Government to Government agreements.

Waste into wealth. The Omnicane ethanol cluster is pioneering the carbon capture for industrial use venture and the association with Air Liquide, the largest world operator in this field, holds major promises for the future. Indeed, carbon capture for industrial use can be a major asset in a world framework where carbon capture and storage (CCS) becomes prominent.

The energy plant of Omnicane requires approval in line with rules and regulations in force and taking into account its importance in the renewable sector.

The CDM methodology has to be modified to take into account the specific needs of SIDS.

In parallel to endeavours on biomass renewable energy, generating firm power, it is necessary to introduce solar energy in the rural areas. This would be in line with Recommendation 18 of the NEC.

In this regard, it is recommended that the Fairtrade Cooperatives be equipped with solar farms of 0.5 MW to 1.0 MW, as the case may be. This may require investments at the level of the CEB. One MW can on average generate 2GWh of electricity.

This measure would reduce overall additional CO_2 emissions, encourage the cooperatives to engage in energy activities, enhance SME activity, and maintain planters in activity through a diversification of activity and income.

Support for such a venture would fully comply with initiatives in favour of vulnerable groups in SIDS and are expected to attract funds from donor/lender agencies.

A thorough assessment of the possibility of using ethanol in dual fired gas turbines taking into account technical aspects and oil economics.

6.6.4 Land development and land abandonment

Some issues such as administrative delays and the reasons thereof, as well as the impossibility to trade land conversion rights have been evoked in the part on stocktaking.

The measures relating to molasses and bagasse are essentially in respect of the avoidance of the emission of additional carbon dioxide and sulphur dioxide. They also reduce risks associated with the carcinogenic poly naphthalenes found in heavy fuel oil and act as insurance against any possible risk posed by MTBE.

Cane abandonment represents a change in use in terms in terms of the emission of carbon dioxide; a carbon sink is being replaced by bare land. Depending on the location, risks of erosion are possible.

The aspirations of the country to attain the status of a high middle income economy and the need to generate intelligent jobs for a highly educated young population also involves a change in use of land and the elimination of a carbon sink.

The sugar reform has entailed major costs and the compact between Government and sugar entities is that the latter be allowed to convert land to recoup costs incurred.

The Sugar Sector Package Deal Act 1985 and the successive SIE Acts provided incentives for the sale of land by large planters via agricultural parcelling to small owners. The purpose was to allow them to own land and to use it for agricultural purposes in the first instance and to subsequently convert it to non-agricultural use in the light of new economic circumstances. The SIE Act as it existed before the SIE (Amendment) Act 2013 allowed such conversions. The Amendment Act of 2013 came up with imposed severe limitations on the conversion of such land from agricultural to non-agricultural use. The Finance Act of the same year restored the rights of the owners. However, the language is open to different interpretation and needs amendment.

Land development generates revenue for Government, firstly, prior to sale: morcellement tax, VAT on inputs, contributions to CEB and Central Water Authority; at sale: land transfer tax and registration duty and income tax; after sale: VAT on inputs. It also generates jobs and value. This has to be viewed against the backdrop of the 4 year continued recession in the building and construction sector.

The most obvious example of advantages secured through a change in land use is the Ebene Cybercity, commenced in 2001. Some 15,000 intelligent jobs have been created over 60 hectares of land; formerly, the same extent employed 50 workers for manual agricultural tasks.

The non-implementation of measures relating to what the MAAS termed difficult areas has been highlighted in the part devoted to stocktaking.

The disadvantages of cane burning were highlighted in the MAAS and the EU Commission and Government agreed that limitation of cane burning be a performance indicator in the context of the Accompanying Measures.

Recommendations

The following is relevant:

- *An aggressive scheme to encourage owners of abandoned land to rent their land to producers wishing to grow canes thereon; the scheme would be based on a minimal legal cadre and would be voluntary and commercially driven; this would maximise production efficiencies and reverse the fragmentation in agricultural land-holdings that has occurred;*
- *The cane cultivation agreements and the Fairtrade Initiative have already been mentioned as means to maintain land under cultivation and enable planters to derive a gainful income;*
- *Many measures described here and earlier represent potent means to limit cane abandonment and to bring back land under cultivation. Taking into account that cane abandonment can be an environmental hazard, and that measures in this regard can have social and political implications, Government should work out a bonus malus scheme to curb abandonment.*
- *The preparation of clear transparent guidelines in respect of land use to foster development in line with the aspirations and ambition of the country while ensuring that as much as possible agricultural land remains under cultivation;*
- *The possibility to trade land conversion rights so that the mix commercial/ marginal or moderate land is arrived at and the non-commercial/prime land mix is avoided;*
- *There is need to clarify the provisions of the SIE Act regarding the conversion of land by persons having acquired land in the context of agricultural parcelling;*
- *The implementation of the measures recommended in the MAAS on difficult areas with a commercial focus as far as possible ; this applies in particular to the South-West and South-East of the island; continued soil conservation in these areas is of paramount importance;*
- *In relation to cane burning, further re-grouping and mechanisation within the future industry should result in continued improvements as the industry's 2001 code of practice is enforced more widely among corporate and re-grouped farmers;*
- *Use of cane trash as boiler fuel will also contribute to minimise planned cane burning;*
- *However, action needs to be taken to severely curb those fires that lie between accidental and criminal ones.*

With these measures and the existing planned activities under the MAAS 2 it is envisaged that the sugar cane industry can continue to provide a significant contribution to environmentally sustainable economic development in Mauritius.

6.6.5 Water availability

Water resources are critical for the sugar industry and the future of what is termed an essential public good is dependent on the availability of this resource.

Cane has, in the case of the holdings of small planters, moved away from the drier areas. The large planters and the corporate sector have invested in irrigation technology that is both water and energy efficient.

Water usage per tonne of cane in sugar factories is among the lowest compared to international norms.

Recommendations

Incentives need to be given to sugar entities to foster further water and energy efficient installations and encourage the use of computer aided equipment where there is an harmonisation between on the one hand, the water needs of the plant , and on the other hand, rain and irrigation water.

Additionally, the industry needs to prepare itself for proposals within the Master Plan for the Development of Water Resources in Mauritius (2025-2050)

6.7 Measures to contain costs

The potential for the Mauritian industry to lower its costs is much more limited today that it was a few years ago. Large parts of cane land have been de-rocked, allowing field activities to be mechanised, where possible; the number of mills has been reduced to just four; there has been extensive right-sizing of the labour force in the field and factory sectors. While, it may be possible extract some further costs savings through efficiency gains — for example, more area will be improved under the FORIP, there is scope for some further mechanisation of corporate lands, adoption of GSP guidance systems for cane harvesters, improved row spacing for planting, etc. — these are becoming more limited and harder to achieve.

Meanwhile, the sector's ability to contain costs is limited by two key issues:

- Stagnant cane/sugar yields, which means that these key aspects of productivity offer planters no compensation for rising input prices.
- Loss of cane land and cane, which limits throughput at mills and inflates unit fixed costs.

These challenges are set against the impending loss of preference in the EU sugar market and a firm currency that provides no offset against weaker *euro* or *dollar* income stream.

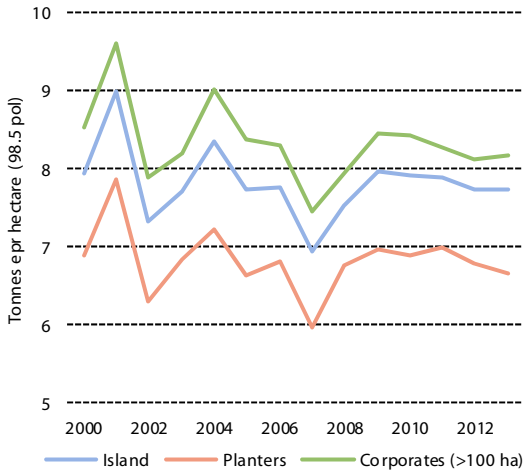
6.7.1 Outlook for cane and sugar yields

As we demonstrated in Diagram 5.12 in Section 5 (repeated here as Diagram 6.3), sugar yield per hectare have been trending gradually downwards for a number of reasons, including:

- Some high-yielding land has gone out of production.
- Adoption of mechanical harvesting, which has been driven by the need to cut costs.

It is possible that this trend will cease and may even be reversed as underlying improvements in cane varieties and farming practices are no longer overwhelmed by the effect of increases in mechanisation.

Diagram 6.3: Evolution sugar yields per hectare



However, the outlook for yields is uncertain and concern is expressed widely about the successful development of new varieties to aid this process. In view of this, there are two measures the industry could take to maximise the output of available cane: optimise the allocation of cane among mills and operate on Sundays to shorten the harvest period.

Potential to increase output by optimising and shortening the harvest period

By ensuring a reasonable allocation of cane among mills and operating on Sundays (as is the norm in other cane industries), the sector could increase its sugar production without increasing area or installed milling capacity.

The potential impact of this can be gauged by the pattern of yields — cane yields per hectare and sucrose content of cane — over the course of the harvest period. These changes are highlighted in Diagrams 6.4 and 6.5.

Diagram 6.4: Evolution of sucrose content of cane during the harvest period, average 2006-2011

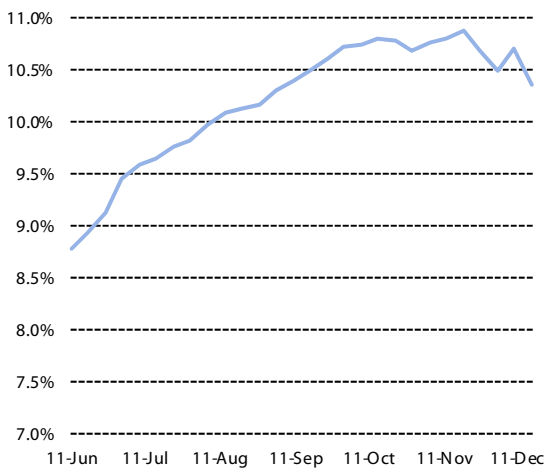
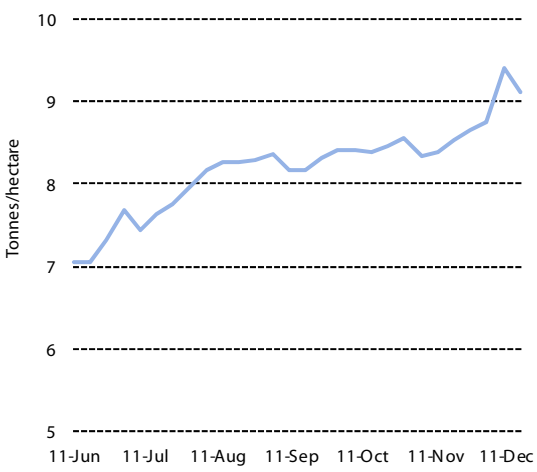


Diagram 6.5: Evolution weekly sucrose yield per hectare over the course of the harvest period, average 2006-2011



- Diagram 6.4 shows the average sucrose content of cane harvested in each week of the season during the years 2006 to 2011. We can see that sucrose content is a lot lower at the start of the season when the cane being harvested is less mature, but increases over the course of the harvest campaign to peak in October and November.

- Cane yields have a less distinct pattern. However, they are noticeably higher towards the very end of the season (i.e. December). By combining sucrose content and cane yields we obtain sucrose yields, which indicates the quantity of sucrose produced per hectare of land. Diagram 6.5 charts the evolution of weekly sucrose yields and, again, we can see that sucrose yields increase over the course of the season.

These observations help us to understand the potential impact a seven day week could have. By operating for seven, rather than six days, cane can be harvested and crushed in a shorter period of time. This would result in a shorter season requiring less of the cane crop to be processed during the early part of the season when sucrose yields are lowest. This will improve average sugar recovery rates and, therefore, mean that more sugar would be produced for a given quantity of cane that is crushed.

We have modelled the impact on sugar output that switching from a six-day to a seven-day week would have on our cane and sugar production projections outlined in Section 5. Our analysis reveals that allowing a seven-day week would reduce the future length of the season by 3-4 weeks. With more of the cane crop therefore being processed when sucrose yields are higher, such a move would have the potential to increase sugar output by 1-2% without any additional increase in cane. This would translate in to additional sugar production of 5-6,000 tonnes in most years.

In commercial terms, the value of this additional sugar must be greater than the incremental cost of producing it, which derived principally from the overtime paid to workers who have to work on Sundays. This issue is addressed in the section on *Employment*.

Section 7: Outcome

Given the considerable strides the industry has already made to lower the costs of field and factory operations, scope for further reduction has become more limited and harder to achieve. In particular, there are no longer any large, easy gains to be made. Instead, the focus must now shift towards a broad range of measures, each of which has the potential to lower costs or improve income and, when taken together, can contribute significantly to ensuring the future viability of as much of the industry as possible.

In practical terms, this means minimising contraction and abandonment of cane lands, maximising small planter participation in the sector, limiting reliance on fossil fuels for electricity generation and maintaining the greatest possible contribution of the sector to Mauritian society and environment.

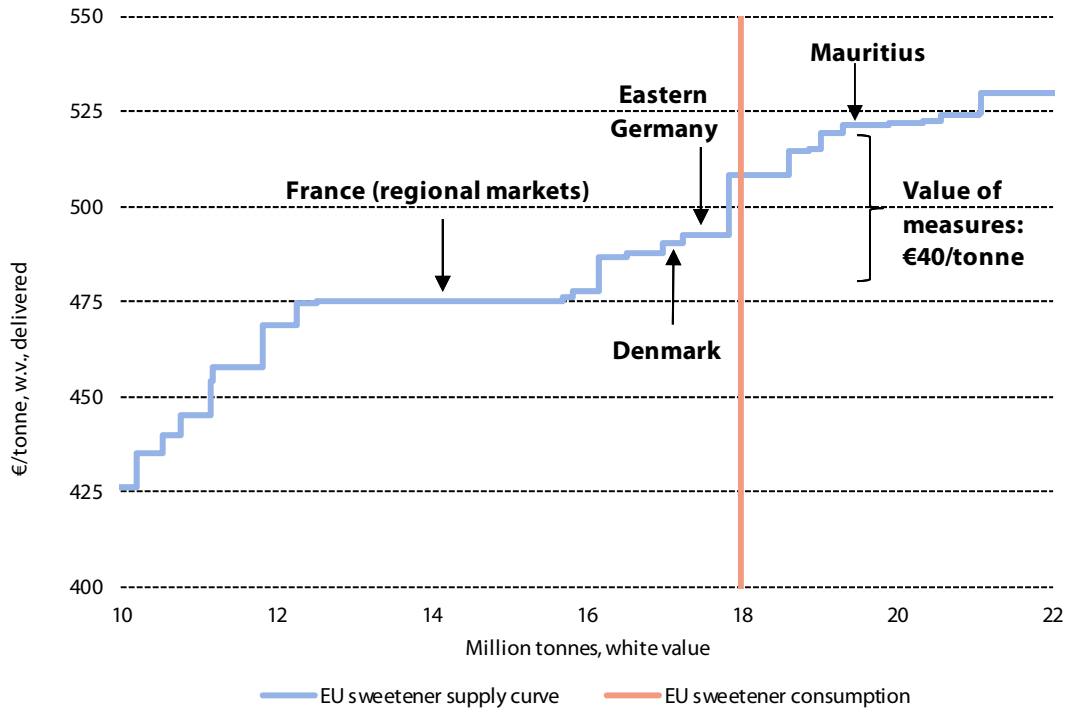
This section comprises three parts:

- In the first, we estimate the likely evolution of industry income in relation to its viability price taking account of the market outlook in key target markets.
- We then quantify wherever possible the potential benefits that can be secured by implementing the measures outlined in Section 6. Using this, we will assess the extent to which they mitigate the effects of the impending erosion of income arising from reform of the EU sugar market.

Key conclusion

Our analysis suggests that, despite the efforts to lower the costs of its field and factory operations over the last few years, Mauritius' competitive position as a supplier to the EU market remains precarious if further measures are not implemented. The main reason for this is that, while Mauritius has lowered its costs, the performance of the EU beet sector has improved markedly over the last decade, which has strengthened its competitive position. To demonstrate this point, Diagram 7.1 presents a cumulative cost curve for the EU market, which includes all the potential suppliers (beet sugar, isoglucose and third countries).

Diagram 7.1: Delivered cost of bulk white sugar, beet sugar and imports



From the diagram, the following conclusions can be drawn:

- Based on its current cost structure, Mauritius would not be a competitive supplier to the EU market after 2017, i.e., its supply price falls to the right-hand side of the demand curve.
- However, the proposed measures would act to lower its supply price by approximately €40 per tonne. This would be sufficient to make the EU a viable market for Mauritius, although it would remain among the higher cost suppliers to the market.

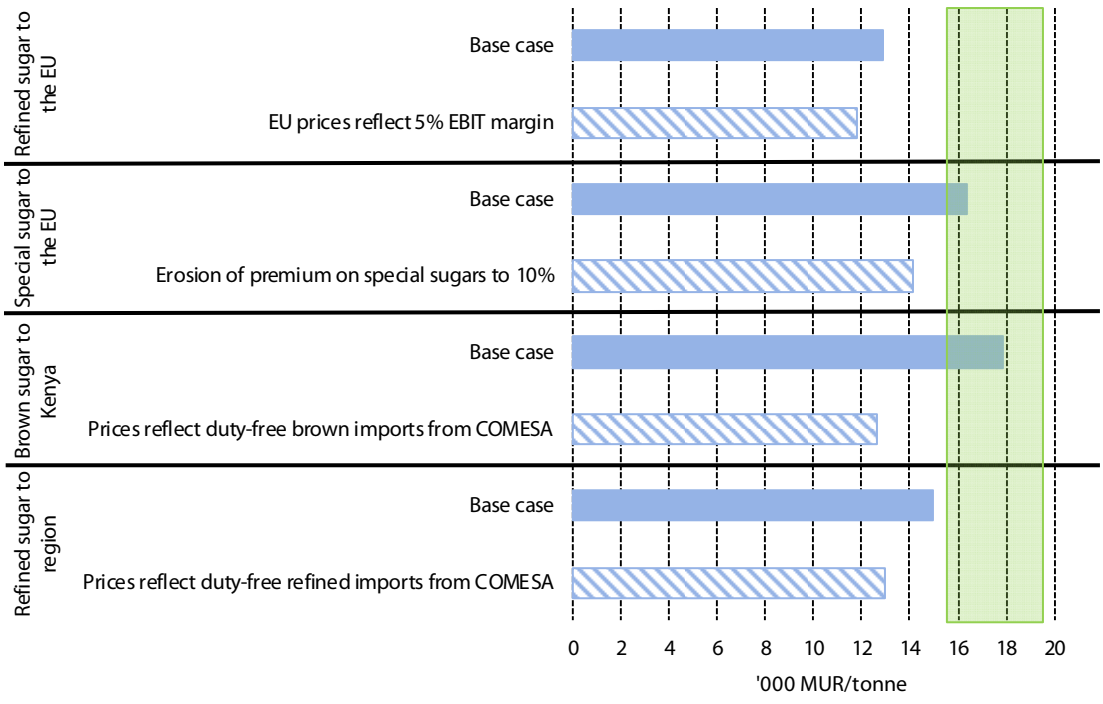
7.1 Business as usual outcome

The unsustainable outcome associated with *business as usual* is discussed in Section 5, in which we contrast the outlook for ex-Syndicate sugar prices from different potential markets with an industry viability price. This is summarised in Diagram 7.2 (which is taken from Section 6) and highlights the gap that exists between the viability price and expected earnings, especially from sales of WRS to the EU (even assuming world raw sugar prices recover to 20 cents/lb). It must be remembered that, with world prices currently trading at well below 20 cents/lb, the situation next 1-2 years is likely to be even worse than presented in the Diagram.

When considered as a whole, the industry's income is derived from sales to a mix of markets, which translates into an industry average price. In addition, planters derive income from by-products that currently amounts to approximately MUR1,000 per tonne of sugar. This means that future industry income will be dictated by three factors:

- Prices in each of Mauritius' potential markets plus any value addition it can achieve.
- The distribution of its sales between these markets.
- The value of by-product income for planters.

Diagram 7.2: Outlook for ex-Syndicate prices from sales in potential markets (assuming a world raw sugar price of 20 cents/lb) and the industry's viability sugar price



Under the current Südzucker contract, and also under the three contracts that will supersede this for the 2015 to 2018 crops, the industry's marketing strategy will remain EU-focussed. It is therefore possible to derive indicative estimates of the average ex-Syndicate price by making best estimates of future prices in each of its main markets, coupled with assumptions about the future distribution of sales. The objective of this analysis is not to determine with precision the evolution of the ex-Syndicate price — which is impossible given the high degree of market certainty — but to:

1. Identify how the gap between expected income and the viability prices is likely to evolve in very broad terms, and

2. Establish the extent to which the measures discussed in Section 6 can help to close this gap over the next five crops (2014 to 2018).

Sugar prices

Our projections of sugar prices are presented in two charts:

- Diagram 7.3 depicts our best estimate of the likely evolution of sugar prices in each target market.

- Diagram 7.4 expresses these prices on an ex-Syndicate basis.

Diagram 7.3: Outlook for prices in target markets

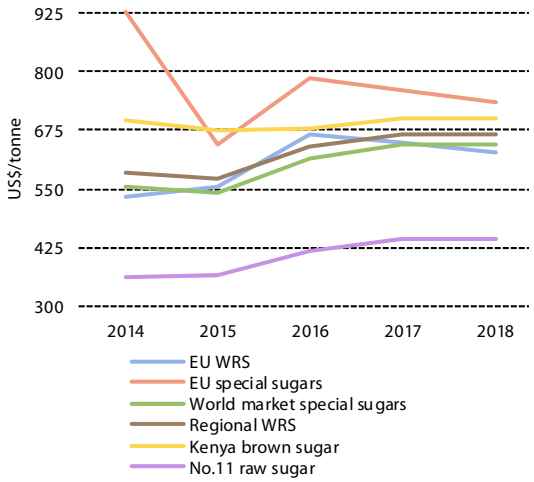
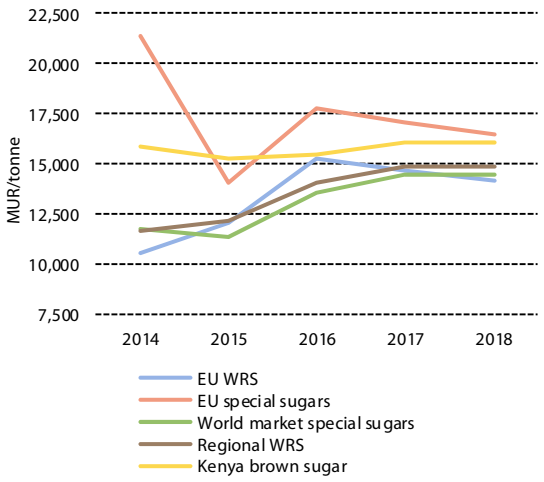


Diagram 7.4: Outlook for ex-Syndicate prices from sales in target markets



The main assumptions underlying these projections, which are explained in Section 7, are:

(a) World sugar prices gradually strengthen over the period and average 20 cents/lb (US$441/tonne) from 2017. In practice, they will fluctuate around this average level.

(b) Sugar prices in the EU also recover as the stock overhang reduces but prices remain under considerable competitive pressure in the run-up and immediate aftermath of the removal of quotas as beet sugar producers seek to defend or enhance their current market shares.

(c) The premium commanded by brown sugar in Kenya over the cost of imports from COMESA comes under pressure in the medium term as lower EU prices result in African exporters more willing to supply their regional markets.

(e) Refined sugar prices in the region reflect the cost of duty-paying imports from the world market and so should also strengthen as world prices recover.

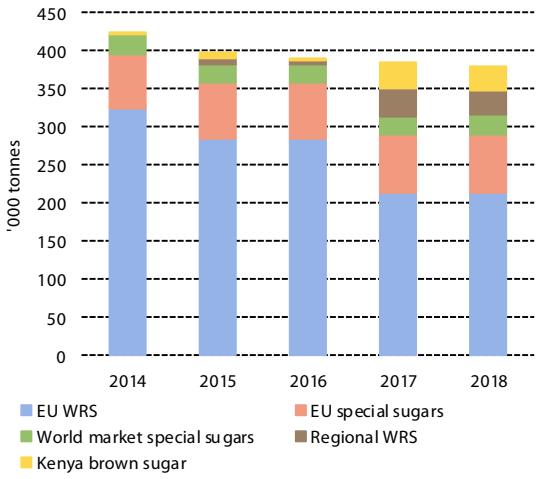
(d) Special sugar trade at a 25% premium over WRS.

Distribution of sales

The industry has always prioritised sales of special sugars over other sugars and this strategy remains, although Mauritius now faces much greater competition in this market segment from other producers. In Diagram 7.5, we have made assumptions about future sales of sugar between the following markets: EU (specials and WRS), world market (specials) and regional (brown and WRS). This projection allows for some further contraction of cane area and sugar output, as discussed in Section 5 and assumes the following:

- Sales of special sugars increase from their current (depressed) level of 95,000 tonnes to 100,000 tonnes by 2018. Of these, we assume 75% are sold in the EU; the remainder are assumed to be sold to world market destinations (although roughly half are, in practice, sold in the US).
- There are modest, but increasing sales of brown and WRS sugar in the region (which we assume to be Kenya). The volumes are calculated as the residual of island sugar after special sugars and commitments to MSS' EU partners are accounted for.
- However, we assume that sales remain limited as the industry's partners will focus their sales on the EU. Nevertheless, we assume sales of brown and WRS sugar to the region grow to around 70,000 tonnes over the coming years.
- The balance of output is sold as WRS sugar to the EU and is assumed to capture a premium of €30 per tonne over our projected price of conventional WRS derived from beets.

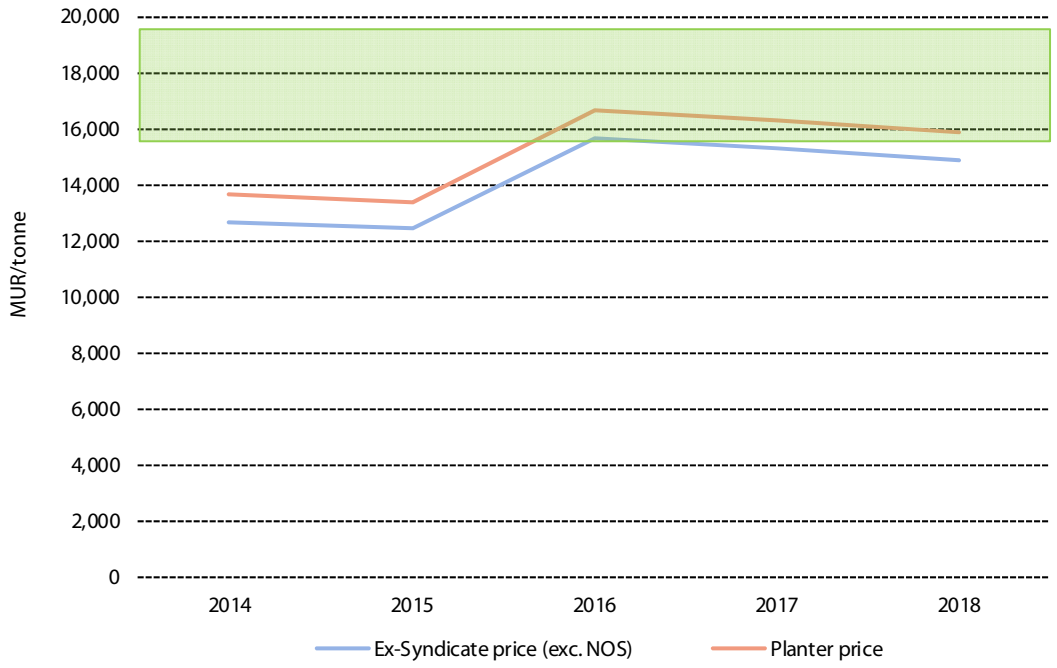
Diagram 7.5: Sales of sugar in target markets



Outlook for the ex-Syndicate price vis-à-vis the industry viability price

By combining the sales prices and distribution of output, we have derived the industry average ex-Syndicate price in Diagram 7.6. We have also indicated the likely level of the planters' price by adding MUR1,000 per tonne for the value of by-products. These prices are contrasted with the range of viability prices shown in Diagram 7.2. These prices assume industry costs continue to rise in the future, largely as a result of wage pressures, reaching an average of around MUR17,000-18,000 per tonne at the end of the period. We show a range of viability prices on the diagram to reflect the diversity of cost structures across the sector. To minimise loss of cane area in the future, prices will have to cover the viability prices of most growers not just the average.

Diagram 7.6: Outlook for the ex-Syndicate price vis-à-vis the industry viability price



7.2 Impact on industry revenues and costs of implementing measures

In this section, we quantify wherever possible the approximate magnitude of the financial benefits associated implementing the measures discussed in Section 6.

7.2.1 Employment

The employment measures described in Section 6 would result in the removal the special status of workers employed in the sugar sector, which are a legacy of the times when the industry could afford to spread the benefits of EU preference. Now, the industry is unable even to maintain is cane supply base, especially among small and medium planters. The measures proposed in Section 6 envisage similar remuneration awards to workers in the sugar sector as to other sectors of the Mauritian economy when the current collective agreement expires.

As we discuss in Section 6, wages annual wages increase for the period between 2014 and 2017 have already been agreed at 7%, 3%, 3%,and 0% plus the rise is cost of living allowance (COLA) for each year. This means that the potential impact of implementing a measure to bring in line sugar sector workers' remuneration with other industries would not be felt till 2018. Therefore, for the purpose of this evaluation, we assume wages in increase as per the terms of this agreement till 2017; however, in 2018 we assume:

- In our business as usual scenario, wages continue to increase at around 7%, which is the rates that which they have increased over the last five years and also the average annual increase implied in period 2014-2018 covered by the new agreement.
- In our 'with measures' scenarios, the increase in wages in 2018 is limited to rises to cost-of-living increases, which has averaged around 4% over the last five years.

In 2018, we estimate that such a measure would result in average costs savings of around MUR 200 per tonne of sugar for the industry. However, over time, limiting wage increases to rises in cost of living could bring about substantial cost savings that could amount to **MUR 1,000-2,000 per tonne of sugar post-2020.**

7.2.2 Seven-day harvesting and milling

A move to seven-day harvesting, which is the norm in sugar industries around the world, has the potential to shorten the season by approximately two weeks. Assuming this saving is made by delaying the start of the harvest, when sucrose yields are at their lowest, and also that there is equal saturation of mills, we estimate that the industry could produce approximately 1-2% more sugar from the same amount of cane.

For the purpose of this simulation, we have derived the value of this measure on the basis of the extra revenue generated. To do this, we have assumed this additional sugar (5-6,000 tonnes per annum) is divided equally between sales of refined sugar to the regional market and brown sugar to Kenya. We have chosen these two markets as they are the most attractive outlet for any additional sugar Mauritius will have that is not committed under long-term contracts focused on the EU.

We then adjust our average ex-Syndicate price to take into account the higher distribution of sales on regional markets and the higher prices received in these markets. Assuming there is no additional cost associated with moving to seven-day harvesting, **the value of this measure is approximately MUR200-230 per tonne.**

As well generating additional revenue, it is important to remember that such a measure would reduce the average cost of producing each tonne of sugar, and this in-turn would bring down average viability prices. This is because more sugar would be obtained from the same quantity of cane produced and processed. We estimate that **the additional output generated by a seven-day week would bring down viability prices by around MUR230-250 per tonne of sugar.**

7.2.3 Sales and marketing

Sales and marketing covers many areas and the industry is constrained in its flexibility for the next five crops, 2014 to 2018, first by its remaining commitment to Südzucker (2014) and then by agreements with three new European partners (2015-2018). Although there will be some flexibility within these new arrangements, and the MSS has not committed its entire tonnage under them, there will be limitations with regard to value addition and new markets. Nevertheless, these arrangements will allow the industry to develop a stronger identity for its sugar, and also to increase the prominence of Fairtrade sugar.

In terms of new measures that are possible within the next few years, one is the imposition of an import duty on WRS imports, which would provide some support for the sugar section in the form of a transfer from consumers.

10% duty on sugar imports

By introducing a 10% duty on imports of white sugar (with raw sugar continuing to enter the country duty free), the country's refiners should be able to supply the majority of the domestic market by importing and refining NOS. As we discuss in Section 4, the profit from this activity will depend on the prevailing level of the world white premium, but is likely to lie between MUR500-2,500 per tonne.

We have assumed imposition of the 10% allows refiners to build up their share of the local market to around 30,000 by 2018, with 4,000 continuing to be supplied with brown sugar. This implies a total value of MUR46 million, assuming an average profit of MUR 1,500 per tonne. When expressed per tonne of island sugar output (around 400,000 tonnes), **the value of this measure is around MUR120 per tonne, on an ex-Syndicate basis.**

7.2.4 By-products

Planters currently derive approximately MUR1,000 per tonne of sugar for the value of by-products. These revenues derive from three streams: bagasse, molasses and a distiller bottler contribution. The measures outlined in Section 6 would increase **the value of by products by more than MUR 400 per tonne of sugar**.

- The bagasse transfer price would rise by around MUR 250 per tonne of sugar if it is set at 1% of the CEB selling prices and would effectively represent a transfer from consumers to planters.
- The value of molasses would rise by approximately MUR 60 per tonne sugar if a return on assets formula is adopted for the purchase of molasses by Omnicane Ethanol.
- The distiller bottler contribution would rise by MUR120 per tonne sugar as a result of an increase of the tax on local sales of spirits.

7.2.5 Cess

The measures regarding the streamlining of institutions envisage a reduction of the cess from 4% to 2%. The value of this will depend on the level of the ex-Syndicate price, but, based on our earlier assumptions on prices and sales distribution, **this measure can be expected to be worth an average of MUR 450 per tonne for ex-Syndicate prices** over the next four years.

7.2.6 SIFB

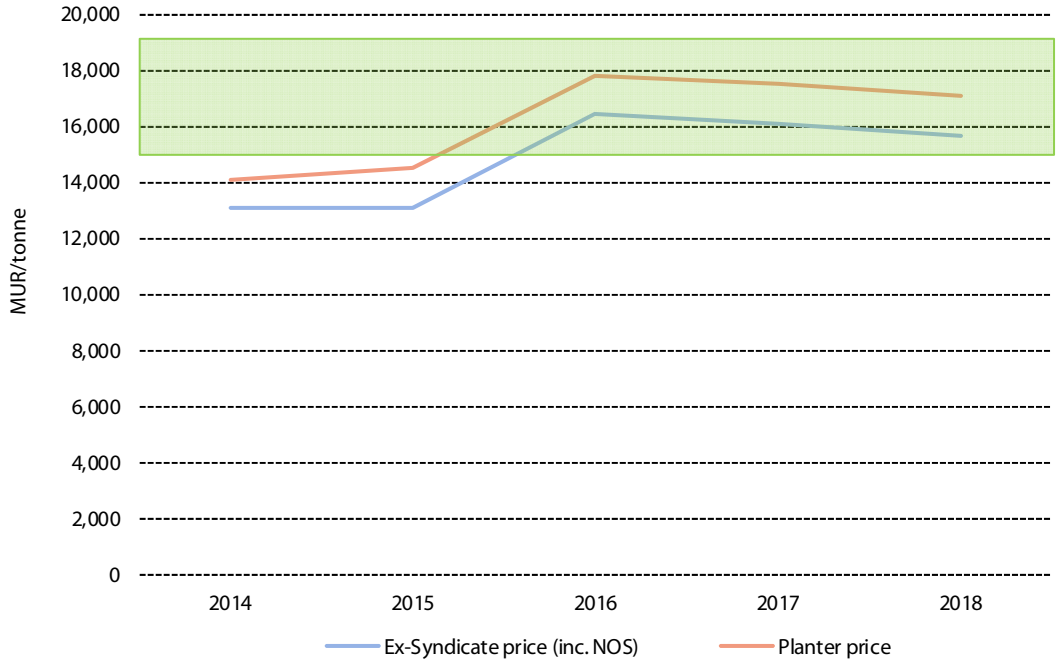
Redistribution of the SIF surplus is finite, but represents a valuable resource to enable the industry to manage the transition up until other measures are implemented. Although a redistribution has already been agreed for 2014, which will amount to MUR 2,000 per tonne of sugar (and will be accompanied by a waiver on the premium of approximately MUR 500 per tonne of sugar), further redistributions cannot be guaranteed. For these to occur, actuarial reviews will be required and agreement received that sufficient funds are available. Nevertheless, the surplus in the SIF is likely to be sufficient for further payments assuming no major events occur that present a major call on the SIF.

In practice, the size of any future payments from the SIF surplus will most likely be linked to the gap between the ex-Syndicate price and some measure of the producers' costs of production, whether this is the industry average viability price or its cash operating cost. Annual payments may also be subject to a maximum.

7.2.7 Outlook for the gap between the ex-Syndicate price and the viability price with implementation of measures

The combined value of these measures is summarised in Diagram 7.7. The diagram is analogous to Diagram 7.6, but includes the additional revenues and cost savings derive above, with the exception of the payments from the Sugar Insurance Fund, which we consider below. The result is to lower industry costs and to inflate the ex-Syndicate price.

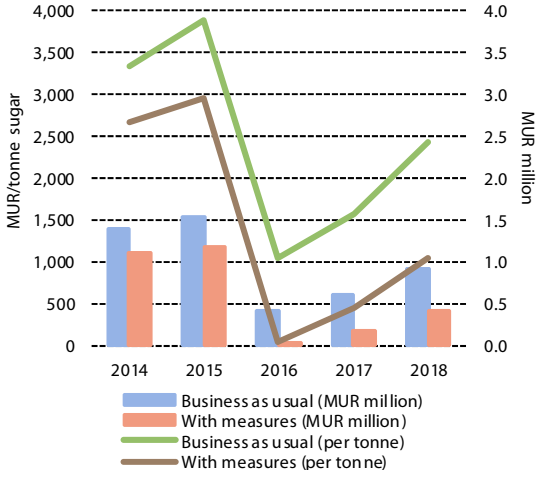
Diagram 7.7: Outlook for the ex-Syndicate price vis-à-vis the industry viability price after implementation of measures



Despite implementation of these measures, there is likely to remain a gap between the ex-Syndicate price and the industry average viability price, especially for the next two crops. The magnitude of this gap is estimated in Diagram 7.8 and is expressed *per tonne of sugar* and *in absolute terms (MUR millions)*.

In reality, the magnitude of the gap will depend on the evolution of market prices over the next few years, the level of sugar output and how successfully and quickly mitigation measures are implemented. Moreover, any measures that require payment of redundancy packages will incur up-front costs, although they will lead eventually to recurrent cost savings.

Diagram 7.8: Projected gap between the ex-Syndicate price and the industry viability price with implementation of mitigation measures



With these caveats in mind, this analysis suggests the gap between the ex-Syndicate price and the average viability price will total close to MUR 5.0 billion during the period 2015 to 2018 if business as usual continues. This compares with the current Sugar Insurance Fund surplus (prior to the 2014 payment) of MUR 5.4 billion. If the above measures are implemented, we estimate that the gap could be reduced. In practice, it will take time for these measures to be implemented, so recourse to the Sugar Insurance Fund will be essential to help the industry to bridge the industry's likely income gap over the coming years.