

# **Implications for cane farming during the period of the EU Phased Price Reduction - The Jamaica Sugar Industry**

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## ***Abstract***

Using a cost/price analysis approach, current cost of production (2007/2008) is used to determine the implications of the EU price regime on cane farming in the Jamaican industry. The results show that farms producing at or below 65 tonnes/ha in the rain-fed areas and those at 70 tonnes/ha and below in the irrigated areas will see negative returns at the 36% price cut. A minimum of 75 and 85 tc/ha in the rainfed and irrigated areas are required to ensure economic survival of the farm. An increasing amount of credit will be required to meet recurrent expenses as earnings decline. Failure to realise the introduction of other income earning products in the short run will result in wide scale farm abandonment across the industry.

## **Background**

The reform of the EU's sugar regime with its progressive price cuts is expected to have significant implications for cane farming in Jamaica, as currently upward of 70% or more of the sugar produced, is sold in that market. The remainder is sold on the US and domestic markets. Under the new price regime, the first cut of 5.1% in the EU's intervention price came into effect July 2006, but its impact on the 2007 earnings was masked as the Euro strengthened significantly against the US dollar. This position is expected to remain unchanged for the 2008 crop since the new regime calls for no further reduction until the 2009 crop, when the intervention price will be further lowered by 12% to yield a cumulative 17.1% cut, and then to a new low of 36% below the 2006 prices by the 2010 crop.

The impact of these price cuts on earnings has been recognized by stakeholders in the industry. To shore up what is likely to be an eroding income base, the consensus going forward is that the industry, in addition to sugar and molasses, must diversify into other income earning products. Among the other products being recommended are refined or white sugar for the domestic market, ethanol for addition to the transport fuel at a 10% level - E10. Co-generation is also being considered, not only for the use at the factory but also to supply electricity to the national GRID (Roberts 2004, James 2007).

Among the policy initiatives announced by government is the planned divestment of all publicly owned factories by June 2008, with the expressed view that the new owners/investors will undertake the needed restructuring for manufacture of these co-products.

Recent studies (Jaddoo 2004, 2007) looking at a diversified sugar industry have indicated that a mix of products - sugar, ethanol and co-generation in sufficient quantities could return crop earnings to near 2006 levels. However, the studies also indicate that to produce such products in the quantities required, a total 3.5 million tonnes of cane must be considered. With current cane production at roughly 2 million tonnes, an additional 1.5 million tonnes would be needed, which can only be

achieved through a massive replanting programme, maybe spanning three to four years at minimum. Therefore, despite a change in ownership, a period of time would be required for these objectives to be realized.

The financial implications for cane growing during this transition, that is, the period from divestment to the point when these other income earning products are realised, have therefore become a matter of great concern to cane growers. Given this particular price scenario which points to reduced earnings, a grower's decision to continue in cane farming would be guided by the capacity of the business to realise a profit or maintain a measure of viability. Otherwise, the grower is likely to discontinue cane growing if the price received is below production cost.

Using a cost/price analysis approach, net return on a per hectare basis was used as the main determinant as to whether a farmer was likely to continue in the business of cane growing.

## Methodology

Net returns on a per ha basis were determined using the current production cost of canes grown under natural rainfall (rain-fed) as well as those grown under irrigation( irrigated) conditions and matching these against cane prices obtained when EU price cuts are applied.

Production cost was derived by using current rates for actual field operations as well as data from suppliers of inputs and services to the industry. Starting with a cane establishment and harvesting cost of roughly US\$3 155.18/ha for the irrigated areas and US\$2 722.14/ha for the rainfed areas, average per ha costs over plant cane and five ratoons were determined at US\$2 248.66 and US\$ 1 735.26 , respectively. These costs represent the higher yield levels used in the study, but are systematically adjusted to reflect the lower yield levels. The calculations assumed loans representing 80% of establishment cost, interest rate of 5%, and a repayment period of three years. It also carries a supervision and management cost of 15%, which is mainly representative of cane farmers as the estates by comparison usually have higher overhead costs and most times higher production costs. Production cost is held constant throughout the study.

To reflect levels of net earnings as they relate to farm efficiencies, three levels of cane yields and two sets of cane prices are employed. For the rain-fed areas, the three levels of cane productivity are 65, 70 and 75 tc/ha, while the cane prices are reflective of two levels of cane quality, Jamaica Recoverable Cane Sugar (JRCS) of 10 which is often achieved; and 10.45, achieved in 2005. The lower level of cane productivity, 65 tc/ha, is reflective of the yield of the average grower; the mid-range is that of a reasonably efficient grower; and the higher level, a more efficient grower.

For Irrigated areas, assumptions are; cane productivity of 65, 70 and 85 tc/ha and JRCS of 10.46 - 10.7. The higher cane yield and JRCS are considered attainable owing to the growers control over the timing of irrigation. However, production costs are inherently higher since canes cannot be economically grown in these areas without this input.

Cane prices are determined by applying the JRCS values to sugar price. The sugar price of \$38 744/t (US\$ 545.69) plus molasses price of \$157.32/t (US\$2.22) obtained in 2007 are used as the base for calculations. Because of the implementation date, July 2006, the first cut of 5.1% would be applicable to the 2007 crop. Therefore, the actual sugar price obtained for the 2007 crop reflects the first cut of 5.1%. This price is also applied to the 2008 crop since there is no planned cut for 2008. However, sugar prices used in the calculations for the 2009 and 2010 crops when the cumulative 17.1 and 36% cuts are implemented, are derived by reducing an assumed EU's portion of the 2007 sugar price (assumed at roughly 76% based on export relative to industry production) by 12% and 30.5% to yield cumulative cut of 17.1% and 36%, respectively, while holding the US and domestic portions constant.

A valuable source of data used in the study is the Cane Yield survey (CYS), an annual project undertaken by the Sugar Industry Research Institute (SIRI). This pool of data provides vital statistics on production and various measures of productivity within the Industry, inclusive of hectares of cane reaped, tonnes cane and sugar produced and fertilizer used. The 2006 CYS represents roughly 56% of hectares reaped and 58% of tonnes harvested. However, data on the overall cane production and productivity of the industry, although not so detailed, are also utilised.

## Results & Discussion

### Net Returns

#### Rain-fed Areas

When cost of production was matched against prices, the analysis showed that at a cane yield of 65 tc/ha, and 10 JRCS, positive income is realized throughout the period of price reduction, though marginal at the 36% cut, **Table 1**. Net earnings realized ranged from roughly US\$521.72/ha at the 5.1% cut, dropping to US\$338.43 one year later at the 17.1% cut and then to a low of US\$49.74 when the 36% cut is implemented in 2009/10. These returns represent ROI's of 33.13, 21.49 and 3.16%, respectively.

<b>Table 1. Net Returns at three yield levels and JRCS of 10 - Rainfed Areas</b>							
		<b>65 tonnes/ha</b>		<b>70 tonnes/ha</b>		<b>75 tonnes/ha</b>	
<b>Price Reductions (%)</b>	<b>Cane Price @ 10 JRCS (US\$/t)</b>	<b>Net Earnings (US\$/ha)</b>	<b>ROI (%)</b>	<b>Net Earnings (US\$/ha)</b>	<b>ROI (%)</b>	<b>Net Earnings (US\$/ha)</b>	<b>ROI (%)</b>
5.1	32.99	521.72	<b>33.13</b>	606.84	<b>36.70</b>	691.82	<b>39.87</b>
17.1	30.15	338.43	<b>21.49</b>	409.45	<b>24.74</b>	480.32	<b>27.68</b>
36	25.72	49.74	<b>3.16</b>	98.55	<b>5.95</b>	147.22	<b>8.48</b>

**Exchange rate 2008 - J\$ 71.00 ≈ US \$1**

At a higher yield level of 70 tc/ha net earnings/ha is improved, and now ranges from a high of US\$606.84 moving down to US\$409.45 and then to US\$98.55 with progressive cuts.

A reasonably efficient farm producing at 75 tc/ha, would achieve a higher level of net earnings relative to those producing at 65 to 70 tc/ha. The calculations show net earnings of roughly US\$691.82 at the current price, falling to US\$480.32 at 17% cut, and roughly US\$147.22/ha when the 36% price cut is implemented. These returns represent ROI's of 39.87, 27.68 and 8.48%, respectively.

**Table 1a. Net Returns at three yield levels and JRCS of 10.45 - Rainfed Areas**

		<b>65 tonnes/ha</b>		<b>70 tonnes/ha</b>		<b>75 tonnes/ha</b>	
<b>Price Reductions (%)</b>	<b>Cane Price @ 10.45 JRCS (US\$/t)</b>	<b>Net Earnings (US\$/ha)</b>	<b>ROI (%)</b>	<b>Net Earnings (US\$/ha)</b>	<b>ROI (%)</b>	<b>Net Earnings (US\$/ha)</b>	<b>ROI (%)</b>
5.1	35.21	666.97	<b>42.35</b>	763.26	<b>46.12</b>	859.41	<b>49.53</b>
17.1	32.17	470.36	<b>29.87</b>	551.53	<b>33.32</b>	632.56	<b>36.45</b>
36	27.42	160.71	<b>10.20</b>	218.06	<b>13.18</b>	275.26	<b>15.86</b>

Exchange rate 2008 - J\$ 71.00 ≈ US \$1

The study also indicates that an improvement in JRCS from the often achieved 10 to that of 10.45 as achieved in 2005, could result in significant increases in net earnings of up to US\$128./ha roughly, with ROI's of 10.20 -15.86% at the 36% price cut, *Table 1a*.

#### Irrigated Areas

Farms in the irrigated areas producing at a yield of 65 tc/ha and JRCS of 10.46 would realize a return of US\$ 366.05/ha at current sugar price, which now reflects the first cut of 5.1%. Net flows for these farms should remain unchanged for the 2008 crop. Beyond this point, the outlook is one of progressively lower returns until they become negative at the 36% price reduction, *Table 2*.

**Table 2. Net Returns at three yield levels and JRCS of 10.46 - Irrigated Areas**

Price Reductions (%)	Cane Price @ 10.46 JRCS (US\$/t)	65 tonnes/ha		70 tonnes/ha		85 tonnes/ha	
		Net Earnings (US\$/ha)	ROI (%)	Net Earnings (US\$/ha)	ROI (%)	Net Earnings (US\$/ha)	ROI (%)
5.1	35.27	366.05	<b>19.56</b>	475.51	<b>24.51</b>	696.18	<b>30.96</b>
17.1	32.24	166.19	<b>9.04</b>	263.46	<b>13.58</b>	438.69	<b>19.51</b>
36	27.46	-140.97	<b>-7.53</b>	-70.52	<b>-3.63</b>	33.14	<b>1.47</b>

Exchange rate 2008 - J\$ 71.00 ≈ US \$1

At cane yields of 70 tc/ha net returns are improved but positive returns are realized only up to 17.1% price cut. Thereafter production cost will just about equate price to generate a break-even position.

Farms producing at relatively higher yields of 85 tc/ha should generate positive returns throughout the price cuts, with ROI's ranging from 30.96 to a marginal 1.47%.

**Table 2a. Net Returns at three yield levels and JRCS of 10.70 - Irrigated Areas**

Price Reductions (%)	Cane Price @ 10.70 JRCS (US\$/t)	65 tonnes/ha		70 tonnes/ha		85 tonnes/ha	
		Net Earnings (US\$/ha)	ROI (%)	Net Earnings (US\$/ha)	ROI (%)	Net Earnings (US\$/ha)	ROI (%)
5.1	36.45	443.52	<b>23.69</b>	558.93	<b>28.81</b>	797.48	<b>35.46</b>
17.1	33.31	239.52	<b>12.80</b>	339.24	<b>17.49</b>	530.70	<b>23.60</b>
36	28.38	-81.79	<b>-4.37</b>	-6.78	<b>-0.35</b>	110.53	<b>4.92</b>

Exchange rate 2008 - J\$ 71.00 ≈ US \$1

An improvement in JRCS from 10.46 to 10.70 would not change the negative position of farms producing at 65 and 70 tc/ha at the 36% price cut. However, those producing at the higher yield level of 85 tc/ha would see improved earnings, with an ROI of 4.92 %, at the 36% price cut **Table 2a**.

## Retained Earnings after Recurrent Expenses

The primary reason for continuing in cane farming ought to be the farms's ability to generate a reasonable return, sufficient to meet recurrent expenses outside of a credit arrangement. These costs are associated with providing basic operations in the succeeding ratoon crop, with some level of retained earnings. These recurrent expenses - fertilizing, weed control, inter-row tillage, irrigation, among others but, exclusive of management, were determined at an averaged US\$505.55/ha. for rainfed areas and US\$728.33/ha for the irrigated areas.

When recurrent expenses were matched against net earnings, farms producing at 65 tc/ha in rainfed areas show retained earnings of less than US\$16.17/ha at the 5.1 % price cut, but earnings become negative as the larger price cuts are implemented. Those at 70 tc/ha would experience a similar trend but of lesser magnitude, *Table 3*. Likewise even reasonable efficient farms producing at 75 tc/ha would not be able to meet recurrent expenses after the first price cut.

**Table 3. Net Earnings after Recurrent Expenditures and Indicative Loan Requirement at the various price cuts & yield levels - Rain-fed Areas**

65 tonnes/ha				70 tonnes/ha			75 tonnes/ha		
Net Earnings from crop at the various price cuts (US\$/ha)	Recurrent Expenses (US\$/ha)	Net Earnings after recurrent Exp. (US\$/ha)	Indicative Loan Req. (US\$/ha)	Net Earnings from crop at the various price cuts (US\$/ha)	Net Earnings after recurrent Exp. (US\$/ha)	Indicative Loan Req. (US\$/ha)	Net Earnings from crop at the various price cuts (US\$/ha)	Net Earnings after recurrent Exp. (US\$/ha)	Indicative Loan Req. (US\$/ha)
521.72	505.55	16.17	-	606.84	101.29	-	691.82	186.27	-
338.43	505.55	-167.12	167.12	409.45	-96.10	96.10	480.32	-25.22	25.22
49.74	505.55	-455.81	455.81	98.55	-406.99	406.99	147.22	-358.32	358.32

Exchange rate 2008 - J\$ 71.00 ≈ US \$1

For the irrigated areas, none of the farms producing from 65-85 tc/ha would not be able to meet recurrent expenses from the cane farming operation during the period, *Table 4*.

The study therefore indicates the need for credit or other source of financing, as net earnings realized are insufficient to meet field maintenance expenses, even at current price & JRCS of 10.70.

**Table 4. Net Earnings after Recurrent Expenditures and Indicative Loan Requirement at the various price cuts & yield levels - Irrigated Areas**

65 tonnes/ha				70 tonnes/ha			85 tonnes/ha		
Net Earnings from crop at the various price cuts (US\$/ha)	Recurrent Expenses (US\$/ha)	Net Earnings after recurrent Exp. (US\$/ha)	Indicative Loan Req. (US\$/ha)	Net Earnings from crop at the various price cuts (US\$/ha)	Net Earnings after recurrent Exp. (US\$/ha)	Indicative Loan Req. (US\$/ha)	Net Earnings from crop at various price cuts (US\$/ha)	Net Earnings after recurrent Exp. (US\$/ha)	Indicative Loan Req. (US\$/ha)
366.05	728.33	-362.28	362.28	475.51	-252.82	252.82	696.18	-32.15	32.15
169.15	728.33	-559.18	559.18	263.46	-464.87	464.87	438.69	-289.64	289.64
-140.97	728.33	-869.30	869.30	-70.52	-798.85	798.85	33.14	-695.19	695.19

Exchange rate 2008 - JS 71.00 ≈ US \$1

### Financing Options

The Government now provides loans to cane farmers through the Sugar Industry Authority (SIA). The loan programme is geared to increased production through replanting of low yielding fields as well as planting new lands, and selective operations such as moulding, weed control and irrigation in ratoon fields. Current loan ceilings are US\$140.85 and US\$211.27/ha for rainfed and irrigated areas, respectively. In light of anticipated decreasing returns at the 17 and 36% price cuts, consideration may have to be given to progressively increasing this amount. This per ha would probably need to be moved from the current US\$140.85/ha to a minimum of US\$358.32/ha for Rainfed areas, and from US\$211.27/ha to US\$695.19 for Irrigated areas. This loan amount could be systematically reduced as yields are increased and other income earning products comes on stream.

### Summary and Implications

Farms in the rain-fed areas, producing at 65 and above should see positive returns even if only marginal in some cases. However, those in the irrigated areas at productivity levels of 65 -70 tc/ha will experience negative cash flow at the 36% price cut.

Minimum yields of 75 and 85 tc/ha in the rainfed and irrigated areas are required to ensure economic survival of the farm.

Marginal improvements in JRCS from current levels will not significantly improve cash flow for farms producing at less than 85 tc/ha in the irrigated areas.

Increasing amounts of credit will be required to meet recurrent expenses as farm earnings decline.

Although the study indicates a minimum productivity of 75 tc/ha in the Rainfed areas and 85 tc/ha in the irrigated areas to achieve a measure of viability, in the 2007 crop productivity for the industry was 65.5 tc/ha, the highest for the past five years. Data showed that a significant number of farms are producing below this level. The 2007 Cane Yield Survey none-the-less showed that of the 10 large estates/farms sampled, five were producing above 75 tc/ha with JRCS of 10 and above.

No significant change in cane supply is expected for the 2009 crop as the anticipated relatively good price for the 2008 crop will mask the impact that the 17% cut will have on the earnings of the farm. Thereafter, in light of expected lower price, cane productivity is therefore likely to fall.

The irrigated areas present a special challenge, as studies carried out by the Institute indicate that in order to counter relatively high irrigation costs, the number of wettings were being restricted, resulting in sub-optimal and uneconomic yields. It is highly unlikely that this low yield phenomenon will change in the short run, given anticipated reduced earnings.

However, the current cane yield/ha indicates a potential for increased productivity and higher income.

Improvement in the JRCS to the 2005 levels would increase earnings and reduce the impact of the impending price cuts. This may be realised through good harvest management as well as improved agronomic practices.

With a strengthening Euro, the loss in farm earnings might be less than anticipated. However failure to realise the introduction of other income earning products in the short run may result in wide scale farm abandonment across the industry.

## REFERENCE

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