AGRICULTURE AND FOOD AUTHORITY
SUGAR DIRECTORATE

QUALITY-BASED CANE PAYMENT SYSTEM

1.0 BACKGROUND

Concern for sustainable socioeconomic development has been the dominant driver of agricultural commodity pricing. In turn, pricing whether controlled by command or liberalized markets, has remained the means of assuring equitable sharing of benefits in the agricultural industry all over the world. Locally, the socioeconomic indicators in the sugar growing regions have persistently shown high prevalence of unacceptably high poverty levels among sugar growers amidst both thriving private and unprofitable government millers and well-to-do service providers. This is attributable to the inequities in the sharing of accrued benefits and risks.

By 2007 only West Kenya Sugar Company had deployed a weight-based revenue sharing cane payment scheme which determined monthly cane prices. All the other mills based their cane payments on a weight-based fixed cane price system which disregarded related production costs, sales revenue or cane quality. The cane price was empirically determined by the government. This system was largely responsible for the inequities observed in revenue sharing between millers, growers and other service providers. The service providers of concern included the miller, cane harvesters and transporters whose payment rates were fixed on behalf of the growers by the miller and regulator in their absence. These rates were often excluded from revenue sharing ratio negotiations.

The legalized cane payment formula and sugar agreements sought to address some of the above inequities.

Overview of cane payment systems

Cane payment systems[1] have always come under scrutiny whenever major changes have occurred in sugar markets affecting revenue. It is believed that the system supports promising tools for driving industry stakeholder performance to the required level of competitiveness.

Cane payment systems are classified into two broad categories; fixed cane prices and revenue sharing systems as show in figure 1 below. The features of each type of cane payment system are often described in the context of cane valuation and pricing, payment schemes, incentives for processors and growers, tradeoffs between value-addition costs and transaction costs, cane quality and seasonality, external determinants of cane quality and products, production costs and revenue and the incentives required to improve cane quality and sugar recovery. These systems basically involve the allocation of Industry revenue to support value addition activities of growers, millers and or marketers.

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[1] ISO, MECAS(06)04, *Analysis of cane and beet payment systems*, 18th April 2006, London.

Such systems contain diverse tools for defining and ensuring equitable sharing of revenues between the above partners. The set of management tools, which define the system, also establish the incentives that these primary stakeholders expect. The two types of systems can be identified as below.

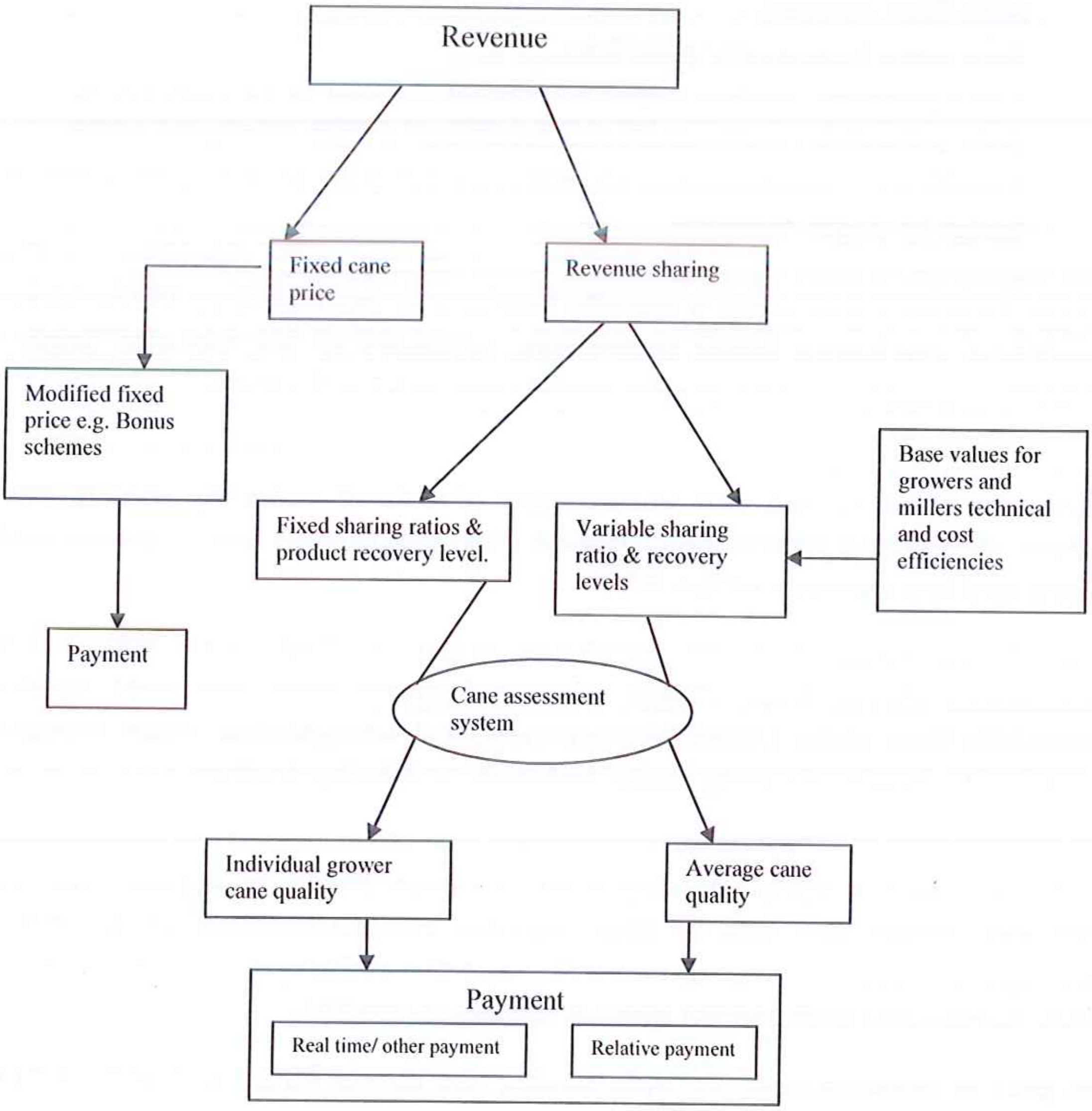


Figure 1. Overview of cane payment systems

Sugarcane is one of the most important crops in Kenya. The cane is mainly produced by small Outgrowers, which constitute about 90% of all crushed cane.

There are several weaknesses in the sugar sub-sector which hamper efficient cane production such as: -

- Small plot sizes of the outgrowers – making mechanizing operations difficult.
- Low cane yields as a result of poor cane varieties with low sucrose and high fiber content.
- Poor cane husbandry practices.
- Cane payment system based on weight instead of sucrose content.
- Poor infrastructural conditions resulting in high transport costs.
- Insufficient maintenance of factories leading to low performance in terms of sugar recovery.

The challenge of poor cane quality was recognized early; therefore the Kenya Sugar Authority was given a specific function to manage it in 1973. Later, its successor, the Kenya Sugar Board was mandated by the repealed Sugar Act of 2001 to implement the quality based cane pricing formula.

Since the 1990s the Government of Kenya has minimized price control and embraced a liberalized and increasingly globalized economy that is market driven. Kenya has joined the COMESA FTA, the revived EAC regional trading block and is a member of the WTO.

The Kenya Sugar Industry produces sugar at high cost and is under permanent threat from cheaper sugar imports from low cost products, especially from some COMESA countries, and was granted Trade safeguards to allow its relatively young sugar industry to develop further.

In addition to the COMESA safeguards, the Government of Kenya and EU had developed a National Adaptation Strategy (NAS) to support the sugar industry whose aim was to help increase competitiveness of the industry through the improvement of efficiency and the reduction of production costs after having lost preferential market access in the EU.

As part of realization of the safeguards, the Kenya sugar industry is now in the process installing a quality based payment system in 11 mills in order to shifting to a quality-based cane payment system as opposed to the existing weight-based cane payment system. The successful partnership between sugarcane growers and millers hinges on a trusted and equitable division of proceeds.

The quality cane payment project was conceptualized to be achieved through **four** result areas as captured by the cane pricing formula.

These result areas and supporting activities included:

1) Creation of sustainable sugarcane production systems through;

    i. Enhanced development of improved seed cane,
    ii. Catalyzed improved breeds uptake,
    iii. Enhanced good agricultural practices complemented by cultivation of improved cane varieties.

2) Sustained efficient sugarcane processing capacity of sugar companies through;

    i. Optimized sugar product outputs to the market,
    ii. Expanded product diversification.

3) Stabilized national sugar products market for;

    i. Priority access by local producers,
    ii. Supply of high-quality competitively-priced products,
    iii. Regulated imports.

4) Linking production and supply efficiencies to market performance by a Quality based cane payment system consisting of cane testing units and various information management systems for weighbridge, laboratory and agricultural operations.

The benefits expected from the new system include:

1) Providing incentives for improved performance of growers and millers,

2) Improving industry competitiveness,

3) Driving quality improvement in the entire value chain,

4) Sharing of benefits and risks between stakeholders,

5) Integrating improved cane variety research into the sugar value chain.

The first pilot cane testing unit was set up in NSC in 2011 using government funds and a second unit was set up in Sonysugar under the associated European Commission (EC) Response strategy program which was supporting NAS through an Annual Action Program (AAP) that began in 2009 under the accompanying measures for sugar protocol countries.

This cane payment projects were intended to support the improvement of Outgrowers cane production to achieve higher yields and better-quality cane through:

- a combination of the adoption of new varieties and better cane husbandry practices for both existing and new varieties,

- the introduction of cane payment system based on sucrose content rather than cane weight, sugar market performance and factory processing efficiency.

This was expected to encourage farmers to use better performing varieties with higher sucrose and lower fibre content. The sugar produced from cane of good quality was expected to be sufficient and of high quality to support a better price.

2.0 THE NEW CANE PAYMENT MODEL

The requirements for cane quality payment, especially for smallholder growers are generally quite demanding on business resources. There are basic requirements, which include:

- Establishment of the basis for pricing;
- Establishing the criteria for valuation of cane and processing services;
- Establishing sampling and testing systems;
- Selection of cane analysis and quality assurance methods;
- Quality-price conversion systems;
- Payment modes.

The sugarcane pricing committee has recommended that payment for cane be made according to the following formula: -

$$\text{Price of sugarcane} = \frac{\text{Pol\% cane} \times \text{KR} \times \text{Farmers share} \times \text{monthly average net price of sugar}}{1 + \text{E\%}}$$

Plus, a percentage of the value of by products.

where:

- **Pol % cane is a measure of the sucrose content of cane**
- **K is the expected mill extraction**
- **R is the expected boiling house recovery**
- **Farmers share is a fixed part of the net sugar Cane price as set by the Sugar Cane Pricing Committee (SCPC) (subsection 8 (1))**
- **Monthly average net price of sugar after deducting taxes and levies**
- **Percentage of the value of the by-products as fixed by SCPC**
- **E % is the proportion of extraneous matter delivered as cane**

2.1 The basis for cane pricing

The above formula established, for the time being, the following basis (variables) for cane pricing:

2.1.1 Pol% cane

This was a measure of the sucrose content of cane as the leading cane quality determinant. It was determined by an independent accredited cane testing entity through a representative sampling scheme and validated analysis method(s).

The model selected for piloting included a high integrity cane testing systems based on core sampling and dry analysis of cane supported by a computer-based random sampling scheme at the Weighbridge, that was based on the grower database maintained in the mill's Agricultural Management System which the cane testing unit (CTU) was able to machine–read through a computer interface. The randomly selected track load sample with a concealed identity was to be directed to a core sampler for core subsampling of cane, followed by its preparation and laboratory analysis.

All analysis data was automatically transferred from the analysis equipment into the information management system without human intervention.

2.1.2 Extraction efficiency, K %

The expected mill extraction efficiency with which sucrose was to be recovered from cane into juice in the month of cane delivery was a number that was to be established by agreement after negotiations or set by an accredited standards body.

2.1.3 Boiling house recovery, R%

The expected boiling house recovery was the efficiency with which the factory recovered sugar crystals from cane juice. This was to be a number that was also established by agreement after negotiation or set by an accredited standards body.

2.1.4 Farmers share

Farmers share was a fixed part of the revenue as determined by the net sugar cane price and the amount of sugar produced. This shall be set by the Sugar Cane Pricing Committee (SCPC) (subsection 8 (1)) on the basis of the costs of sale for cane and sugar (including marketing) as determined by the audited accounts of both parties in the immediate past financial year. The farmer's share is typically expressed as a ratio.

2.1.5 Monthly average net price of sugar

The monthly average net price of sugar shall be determined by the average exfactory sugar price less taxes and levies in the month preceding cane delivery and shall be ascertained by the SCPC.

2.1.6 Value of the by-products

The value of by-products may be assigned to the grower by the SCPC based on by-product valuations and related revenue in the previous month.

2.1.7 Extraneous matter, E %

The proportion of extraneous matter delivered as milling cane. This quality aspect was undesirable and was discouraged. This value may be standardized as explained earlier.

2.2 Cane Value assignment

The value of cane shall be determined by its quality, the market price of sugar and other co-products, the cost and efficiency of value addition processes. This value will become the basis for setting the cane price and may remain provisional until such a time that final audited accounts of cane producers and processor shall have been published to determine the final value of cane.

2.3 Quality-price conversion system

The growers' gross cane proceeds shall be determined by the price derived from the above formula and the amount of sucrose delivered as determined by multiplying sucrose content and total weight of cane delivered in the month. The net proceeds shall be determined by the deduction of contractual charges and accruals from these gross proceeds. The Quality to price conversion shall be effected through Agricultural or Enterprise Resource Management Systems at the Mills.

2.4 Payment modes

The application of the formula may vary depending on the sugarcane and sugar marketing and distribution system. Whereas in Kenya, cane may be supplied by individual growers, grower institution or millers and that each Miller markets all products from their sugarcane processing, the revenue may be first shared between the Miller and all growers who supplied cane, on the basis of standardized variables. Elsewhere growers and millers are grouped in organized institutions and products are marketed centrally.

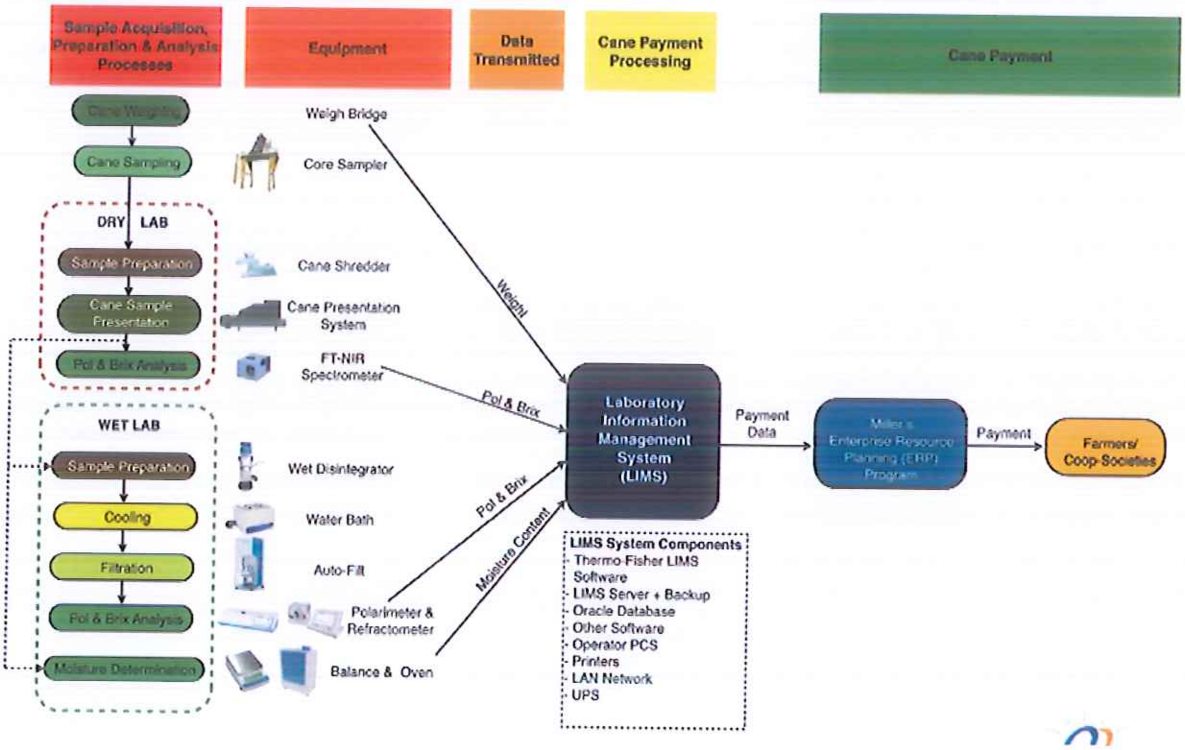
The assignment of proceeds begin by splitting the sharable revenue between growers and millers, sometimes after deducting marketing and distribution costs where sugar marketing is centralized, on the basis of standardized variables in the pricing formula. Proceeds may, thereafter be distributed among Miller or Grower groups in accordance with individual Miller process efficiency and grower cane quality respectively.

In the proposed payment system, the sharable revenue will be distributed by the Miller or Grower institution directly to individual growers based on the quality of their cane.

The incentive for continuous improvement was based on the difference between the actual and standardized values of the variables in the pricing formula.

3.0 IMPLEMENTATION OF THE MODEL

The industry has delayed in the design and implementation of the quality cane payment system. Results from pilot cane testing units (shown below) show that capital costs were high in an already high cost industry, hence slowing down the implementation of quality payment initiative. While suitable technology was being sought, the industry, through the SCPC, attempted to improve equity in the sharing of industry benefits, through a simplified payment formula.



Currently 9 cane testing systems have been installed, ready to be integrated with Mill Agricultural Information Management Systems while the two pilot projects are being upgraded for the purpose of enabling the commissioning of the Quality based cane payment system by 2022.