rather than find formulae for apportioning between the grower and the factory-owner the profits or losses arising out of sugar sales in the open market.

Mr. M. Lakshmikantham presented the following paper.

**Paper**

**ON FIXING CANE PRICES**

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**INTRODUCTION**

Fixation of cane prices equitably is a problem of great magnitude in a country like India, if statutory action is contemplated on an all India basis. Even though a large part of the cane produced in India is crushed for jaggery manufacture, quite a considerable quantity (20-25%) is supplied to sugar factories for white sugar manufacture. Unlike in some of the other sugar producing countries, the number of cane suppliers involved is large and costs of cane production vary widely in the different states. Hence fixation of a common price for the whole of India satisfying a majority of growers as well as the factory owners is extremely difficult.

Payment of cane on quality basis is an unexceptionable principle. But where a large number of cane suppliers as in India is involved, evolution of a workable basis for price fixation appears apparently impracticable.

It has to be admitted that except in an 'adhoc' manner, when some higher price was paid in certain seasons to a few varieties (considered richer than the normally supplied canes) or long duration crops (adsali) that facilitate commencement of crushing early, no systematic and specific attempts seem to have been made to ensure supply of rich canes for crushing by paying appropriate premiums. A plea is made in this paper to make the cultivators quality conscious by payment of suitable 'bonus', and certain steps have been suggested for adoption towards this end. The conditions obtaining in the Andhra State form the main basis of the observations made in this paper.

**REVIEW OF LITERATURE ON CANE PRICE FIXATION**

The methods of cane price fixation in different countries were reviewed by Spencer and Meade 1945(1), Lakshmikantham 1948(2), Gopala Iyer 1950(3), and others. Paboa and Davila 1950(4), reported that the percentage share of the cane supplier in the quantity of 96° sugar produced increased from 63.5 to 67.5 when the sugar yield percent cane increased from 9% to 14.50% in Puerto Rico. The share of the miller decreased to the extent that of the cane grower increased. According to Locsin 1953(5), the percentage yield of raw sugar to each colono in this country, is determined by analysing crusher juice samples continuously. "In Philippines payment for cane is based on a division of the sugar produced between planter and miller on 63 : 37 basis. Continuous crusher juice first expressed samples are taken and analysed for pol and purity. Every week
the actual sugar production is correlated with calculated production and planters' share determined. From the analysis of first expressed juice a fixed table of recoveries is worked out, based on 94 mill extraction, 34 gravity purity of molasses, 96.5° pol of sugar and 93.5 Java Ratio. In Louisiana the value of cane is directly related to price of raw sugar. The cane purchase contract defines a range in the sucrose content of the cane within which one ton of net actual cane, equals one standard ton. Generally one sucrose sample is taken for each 50 tons of cane delivered. Each sample consists of 3 to 12 stalks. In Cuba, mills pay cane in percentage of 96° sugar, regardless of cane quality. The juice is continuously sampled on predetermined lots of the grower's weekly deliveries in Queensland, fibre and C.C.S. are estimated and cane is paid on the basis of C.C.S. percent. Full details of the procedure adopted in recent years in the making of a price scale for payment of cane in this country were described by Macgibbon 1951(6). To make the calculation of C.C.S. more accurate Kerr 1952(7), suggested installation of juice weighing scales in all mills. According to him the total weight of cane sugar and impurities taken into the factory can then be assessed accurately and so the true C.C.S. in cane.

The methods of payment adopted in Cuba (flat rate) and Queensland (based on C.C.S. % cane) may be characterised as the simplest and most rational respectively. The case of India is somewhat similar to that of Cuba in this respect. Cane price is being fixed on a flat rate, in both the countries. But while the flat price is a pre-determined percentage of 96° sugar on the weight of cane in Cuba, no apparent link is discernible between cane price and quality of cane or price of sugar in India.

The disadvantages of fixing a flat price "when the same price is fixed for wood and water as for sucrose" are obvious. Any system based on juice analysis is superior to a system based on flat price regardless of cane quality. But as Spencer and Meade put it "it is doubtful whether complicated methods of calculation result in a more equitable distribution than do the simple systems which have been worked out through an economic custom". Gandhi 1945(8), detailed the various steps taken in India for statutory fixation of cane prices by the Central and State Governments. Till 1934, the price of cane was fixed on demand and supply and there was no legislation fixing the minimum price of cane. The Sugar Technologist to the Imperial Council of Agricultural Research suggested, towards the end of 1933, that the price per maund of cane should be equal to half the cost of sugar made from it. A statutory irreducible minimum price was fixed for the first time in 1937-38 in the U.P. and Bihar. Two years afterwards U.P. and Bihar decided to fix the minimum price based on fortnightly sugar prices. But this policy was short lived and was changed from 1940-41 to non-varying minimum prices. In subsequent years other provinces like Madras, Mysore and Hyderabad fixed minimum price for sugarcane. It will be evident that, but for the formula suggested by the I.C.A.R. there had been no attempts to correlate quality of cane with its price. During 1948-49 season the South Indian
Sugar Mills Association drew up a memorandum suggesting fixation of a basic minimum cane price and giving a share in surplus profits realised by millers when sugar prices ruled high. This formula popularly known as 'SISMA' formula introduces indirectly a premium in the price paid to the cane supplier. As per this, the price payable for cane by any factory ranges between 55% to 70% of the net price of sugar when the price of the later varies from Rs. 440/- to Rs. 940/- per ton. The return to the agriculturist improves by 3 percent for each slab above Rs. 440/- of sugar price. By dividing the share of the net sugar price to the agriculturist with the number of tons of cane used in the production of one ton of sugar, the price per ton of cane is worked out. Actual application of this formula for payment of cane price was tried on an agreed basis between the cane growers and factory owners for only one year during 1952-53 in the Madras State.

In recent years the Government of India have taken up the fixation of minimum cane price and the basis on which prices are being fixed, have not been clearly indicated. The minimum is being announced two seasons in advance to put the cane supplier as also the manufacturer-wise about the possible returns they may expect in the coming season. During 1954 a formula was evolved, at the instance of the Government of India, based on the principle that the cane growers should get the same percentage of the net price of sugar as is the percentage of the cost of cane to the cost of production of sugar excluding taxes. This formula is in the first instance to be applied for payment of cane crushed in 1953-54 season. According to this formula the percentage share of the net price of sugar to cane growers ranges between 53% in East U.P. and North Bihar, to 60% in West U.P. and Bombay. The share of the growers as per this formula is found to be much lower than what the cane growers are reported to be getting in countries like Puerto Rico and Philippines. It has also been noted that the cane growers of the Andhra state realised invariably lower prices than what they would have got according to SISMA formula.

**SPECIAL FEATURES OF THE INDIAN SUGAR INDUSTRY IN REGARD TO CANE PRICE FIXATION**

Since cane holdings are small, the number of cane suppliers in this country is, as already mentioned, very high. Estimation of quality of cane supplied by individual ryots is therefore difficult. Another peculiar feature of this country is the vital influence of jaggery prices on the cane supply to sugar factories. In years of high gur prices factories are starved for cane and have an uneconomic crushing season. Duration of crushing, thus assumes unusual importance in this country with regard to cane price fixation unlike in other countries. Under the existing conditions it is not possible to reckon without it.

According to the latest Tariff Board Report of 1950(9), on the sugar industry, Panje suggested date bound variation in cane price payment in the interests
of lengthening the duration of crushing. It is claimed that the scheme provides for variation in cane supply according to demand and supply at the different parts of the crushing season. As per this, during the early part of the season when gur price is high, even though the sucrose content is low, the scale of payment should start with a moderately high price and slowly increase at regulated interval so as to reach the highest level at the peak of the season. In the later part of the season, when the sucrose content goes down and when cultivator is anxious to clear the field, the price will be slightly lower than the peak level. It is suggested that the scale of variation of price over successive intervals of time may be so drawn up that the average of the prices paid will be approximately the same as the minimum price paid by the Government. No provision is made in this scheme, for encouraging supply of rich canes nor will be cane suppliers have a share in the surplus profits derived by millers when sugar prices soar high.

A proposal to link duration of crush with payment of bonus as per SISMA formula, was first mooted by the Sugarcane Specialist, Ankapalle, by circularizing all the sugar mills in composite Madras State in 1953. M/s Parry & Co., propounded a modification of the SISMA formula recently, apparently based on this suggestion. They proposed payment of full additional price according to SISMA formula (which they termed as bonus) only when a factory crushed to its full rated capacity for over 70% of the normal season. According to them normal season is to be taken as 120 days of working. The rate of bonus is to be proportionately reduced when the duration of the crush is shorter, and completely eliminated, when it is less than 50% of the economic crush.

SUGGESTIONS FOR CANE PRICE FIXATION

Basic minimum price. The Indian Tariff Board (1950) suggested that besides cost of cultivation (a) estimated return to the grower if he converts his cane into gur, (b) quality of cane, (c) probable estimated return to the grower from alternative crops, (d) parity prices of important articles of consumption for the cane grower, such as food grains, should be taken into account while fixing prices of cane. During the period 1933-36 the Imperial (now Indian) Council of Agricultural Research sought to estimate the cost of production of sugarcane in the sugarcane tracts in India directly. Village investigators were stationed in select villages and they noted the labour employed and cash expended in raising sugarcane in select holdings. The statistics collected have been published. These do not seem to satisfy the present statistical standards. A scheme of work is now again in progress for collection of data on cost of cultivation of sugarcane in factory areas of select states. The nature of work in this scheme seems to be identical with that carried out previously. Field investigators have been employed to collect the data on the basis of objective observations. The selection of village holdings, however, had been done
according to the stratified random sampling method. How far the statistics of production collected in this scheme will satisfy the cane cultivators as basis for assessing cost of production, remains to be seen.

In order to improve accuracy in maintenance of accounts, it seems desirable to entrust this work to Agricultural graduates of the rank of Assistants and not to the village or field investigators. This scheme should be worked on a permanent basis since cost of production changes from year to year. The fields or villages may be changed to satisfy the statistical standards. Apart from the actual cost of cultivation, other items of expenditure that are to be included in the cost structure of sugarcane, such as repairs and renewals etc., have also got to be worked out each year to arrive at the basic minimum price. Information on the parity prices of commodities needed by the cane cultivator as also the returns he gets by taking to alternate cropping or converting his cane into gur has also to be gathered by the investigator. The principles that should govern the relationship between these items of expenditure and the actual cost of cultivation have got to be established in consultation with economists. If agricultural graduates are employed in the collection of basic data they will be able to furnish reliable information that facilitates working out these principles. The basic minimum price thus worked out in a year will be applicable to the next year. This basic minimum should not be fixed on an all India basis. It has to be only on a State level.

SHARE OF INCREASED PROFITS TO BE PASSED ON TO GROWERS

The attempts made from time to time by the Sugar Mills Association, individuals or Government to enunciate the principles of profit sharing between the mills and the cane suppliers have been briefly described in the foregoing pages. The original SISMA formula favours indirectly supply of quality cane. But it encourages, the millers and the growers to bargain for exhorbitant sugar prices because the share of the profit, especially that of growers progressively increases with increase in sugar price. The formula suggested recently by the Government of India does not seem to benefit the cane suppliers of this part of the country (Andhra State) for, the price as worked out in certain factory areas according to this formula was, lower than even the statutory minimum price by about one rupee per ton. Hence a modified formula laying emphasis on the quality of sugarcane is suggested and described in the sequel.

When the sugar recovery percentage is 9% or below it, the minimum bonus as proposed by M/S Parry & Co., may be paid. For every slab of 0.5% increase in sugar recovery 5% increase in the proposed bonus is suggested when the duration of crush is over 50% of the normal. Details of the modified formula are embodied in Table I.
TABLE I
FORMULA FOR DETERMINING THE AMOUNT OF BONUS (EXTRA* OVER MINIMUM PRICE TO BE PAID FOR CANE) IN RELATION TO DURATION OF CRUSH AND PERCENTAGE RECOVERY OF SUGAR

<table>
<thead>
<tr>
<th>Percentage of bonus to be paid at different levels of sugar recovery</th>
<th>9.0% and below</th>
<th>9.50%</th>
<th>10.00%</th>
<th>10.50% and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of actual cane crushed as a percentage of normal crush</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>upto 50%</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>51%--55%</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>56%--60%</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>61%--65%</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>75</td>
</tr>
<tr>
<td>66%--70%</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>over 70%</td>
<td>100</td>
<td>105</td>
<td>110</td>
<td>115</td>
</tr>
</tbody>
</table>

* The extra price or bonus is to be arrived at according to the SISMA formula.

Assuming the gross price per ton of sugar to be Rs. 850/- and the statutory minimum cane price as Rs. 1/7/- per maund the extra amount payable per ton of cane for different recoveries and durations of crush has been worked out and presented in Table II.

TABLE II
EXTRA AMOUNT PAYABLE PER TON OF CANE FOR DIFFERENT DURATIONS OF CRUSH

<table>
<thead>
<tr>
<th>Duration of crush</th>
<th>Amount of bonus payable as per revised formula per ton of cane at different recoveries</th>
<th>9% and below</th>
<th>9.5%</th>
<th>10%</th>
<th>10.5% and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>upto 50%</td>
<td>0.1001</td>
<td>0.3278</td>
<td>0.5553</td>
<td>0.7828</td>
<td></td>
</tr>
<tr>
<td>51--55%</td>
<td>0.2002</td>
<td>0.6195</td>
<td>1.6659</td>
<td>2.7398</td>
<td></td>
</tr>
<tr>
<td>56--60%</td>
<td>0.4004</td>
<td>1.4751</td>
<td>2.7765</td>
<td>4.3054</td>
<td></td>
</tr>
<tr>
<td>61--65%</td>
<td>0.6006</td>
<td>2.1307</td>
<td>3.871</td>
<td>5.871</td>
<td></td>
</tr>
<tr>
<td>66--70%</td>
<td>0.8008</td>
<td>2.7863</td>
<td>4.9977</td>
<td>7.4366</td>
<td></td>
</tr>
<tr>
<td>Over 70%</td>
<td>1.001</td>
<td>3.4419</td>
<td>6.1083</td>
<td>9.0022</td>
<td></td>
</tr>
</tbody>
</table>

N.B.—Gross price of sugar — Rs. 850/- per ton
Minimum price of cane — Rs. 1.7-0 per maund (Rs. 39.130 per ton)
Excise duty — Rs. 112.5 per ton
Sales tax — Rs. 11.523 per ton
Sales commission — Rs. 7.375 per ton

The increased monetary benefit to the sugar factories due to higher recovery has been worked out with reference to a 600 tons factory for different durations of crush and the figures are furnished in Table III.
TABLE III

QUANTITY OF EXTRA SUGAR MADE DUE TO HIGHER SUGAR RECOVERY AND THE EXTRA NET PROFIT MADE DUE TO INCREASED PRODUCTION OF SUGAR

<table>
<thead>
<tr>
<th>Percentage of crush</th>
<th>Quantity of cane crushed Tons</th>
<th>Quantity of sugar made in tons at recoveries</th>
<th>Additional quantity over 9% recovery due to increase in recovery Tons</th>
<th>Gross price of increased quantity of sugar made at higher recoveries at Rs. 850/- per ton</th>
<th>Extra profit made by the factories</th>
</tr>
</thead>
<tbody>
<tr>
<td>9%</td>
<td>5%</td>
<td>10%</td>
<td>10.5%</td>
<td>10%</td>
<td>10.5%</td>
</tr>
<tr>
<td>50%</td>
<td>36,000</td>
<td>3,240 3,420 3,600 3,780</td>
<td>180 360 540</td>
<td>1,53,000 3,06,000 4,59,000</td>
<td>1,17,151 2,34,309 3,51,467</td>
</tr>
<tr>
<td>55%</td>
<td>39,600</td>
<td>3,564 3,762 3,960 4,158</td>
<td>198 395 594</td>
<td>1,68,300 3,36,600 5,04,900</td>
<td>1,13,359 2,17,724 3,13,081</td>
</tr>
<tr>
<td>60%</td>
<td>43,200</td>
<td>3,888 4,104 4,320 4,536</td>
<td>216 432 648</td>
<td>1,83,600 3,67,200 5,50,800</td>
<td>1,06,305 2,00,816 2,86,500</td>
</tr>
<tr>
<td>65%</td>
<td>46,800</td>
<td>4,212 4,446 4,680 4,914</td>
<td>234 468 702</td>
<td>1,98,900 3,97,800 5,96,700</td>
<td>91,344 1,72,098 2,42,204</td>
</tr>
<tr>
<td>70%</td>
<td>50,400</td>
<td>4,536 4,788 5,040 5,292</td>
<td>252 504 756</td>
<td>2,14,200 4,28,400 6,42,600</td>
<td>75,419 1,39,452 1,92,020</td>
</tr>
<tr>
<td>100%</td>
<td>72,000</td>
<td>6,480 6,840 7,200 7,560</td>
<td>360 720 1,080</td>
<td>3,06,000 6,12,060 9,18,000</td>
<td>74,952 1,33,729 1,68,005</td>
</tr>
</tbody>
</table>
Taking the lowest increase of 0.5% recovery and a minimum crush of 50% of the normal or economic crush, the distinct advantage to the factories in encouraging quality will be evident from the following figures.

Value of extra sugar made due to 0.5% increase in recovery over 9% at 50% crush

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of extra sugar made due to 0.5% increase in recovery over 9% at 50% crush</td>
<td>Rs. 1,53,000</td>
</tr>
</tbody>
</table>

Less

1. Additional bonus that has to be paid on cane crushed in 60 days (50% normal crush)
   
   $600 \times 60$ tons = 36,000 tons @ Rs. $0.3278 - 0.1001$ per ton
   
   Rs. 8,197

2. Excise duty, sales tax and sales commission on 180 tons of sugar
   
   Rs. 23,652

3. Additional expenditure in handling etc., of 180 tons of extra sugar made due to increased recovery and allowing for any incidental expenditure (assumed)
   
   Rs. 4,000

Total deduction

Rs. 35,849

The net additional profit to the miller will thus be about Rs. 1,17,000/- for 1% increase in recovery over 9% even with only 50% of the normal crush.

ENCOURAGING QUALITY IN INDIVIDUAL HOLDINGS

These things apart, if sugar production is to be cheapened no stone should be left unturned to make the cane suppliers quality conscious as emphasised at the outset. This consciousness has to be brought about only by providing additional inducement to individual suppliers of rich cane in the form of extra payment apart from the general benefit that accrues due to payment as per the formula suggested above. For this, there is need to estimate the quality of cane separately supplied by individual cultivators. Even though the problem at first sight appears stupendous, it seems capable of solution.

Full details in respect of the cane crops in the reserved area of each factory should be in the possession of the respective factory authorities. Harvest programme has to be based on certain accepted general principles. Ratoons have to be cut first followed by plant crops. Ratoons of early maturing varieties, plots that were ratooned earlier, plots that were waterlogged or that do not command adequate water supply late in the season, have to be given priority. For plant crops, date of planting, nature of variety and level of manuring are important criteria that should govern the issue of cutting orders. A quality survey of all the fields in the reserved area of each factory has got to be conducted by means of hand refractometers in December. This should guide harvest control.

A cart load of cane in this State (Andhra) weighs about a ton. Each cane grower has to supply a minimum of two tons of cane every time. Then it is possible to arrange for continuous sampling of juices by instituting a
sampling device like the Sivyer Sampler, or by employing human labour. It has been reported that the automatic method of sampling has been perfected by means of a modern mechanism installed at Victoria Mill in Queensland recently (10). "It consists of a juice collecting tray and pipe through which the juice is pumped to a series of containers in the form of segments mounted on a circular table in the laboratory. When there are two tandems, two such tables are installed. Juice analyses are made by the shift chemist. The accuracy of the system depends on accurate timing which is accomplished by the operation of a Strugnell Wheel. On the edge surface of the wheel, spaced holes accommodate pins which are inserted to show the end of a sample and the commencement of the next sample, the space between pins representing the neutral or the flushing period. As the carrier moves upward the wheel revolves and as the end of the sample passes through the rollers, the pins denoting the end of that sample operate a switch on the motor. This moves the sample can into its neutral position and at the same time cuts off the flow of juice. Then as the next sample is passing the rollers, the next pin touches the control switch which moves the next sampling can into position, turns on the juice flow and starts the motor again which draws the juice to the vessel". Wherever there is no provision for electrical operation of this automatic sampling mechanism, it is possible to engage persons for juice sampling by suitable arrangements to mark the beginning and end of crushing of every parcel of cane dumped into the carrier. A carrier supervisor should note the names of the individual cane suppliers in the order in which their cane is loaded into the carrier. There should be a separate person for signalling the juice sampler with regard to commencement and closure of crushing of cane from individual suppliers.

Certain practical considerations as detailed below have to be taken into account while devising means to analyse canes supplied by individual growers in small lots.

1. Cane is not put into the carrier directly from the cart or lorry at times. It is stocked, when a breakdown occurs, the stocks accumulate and it is impossible to stock cane got by each individual separately.

2. When cane is supplied in the cart loads, the number of samples to be analysed will be very high in the case of plants with large crushing capacities.

3. When cane is brought in rail wagons from out stations analysis of cane belonging to individuals is not possible.

Under these circumstances when uniform conditions of cane supply do not obtain automatic juice sampling methods will not be of much avail. Human labour may be employed for sampling and the following procedure adopted in working out the scheme.

Two tons has to be the minimum limit for each individual supplier per day in the case of factories crushing about 500 tons per day. When the capacity is higher the limit has to be increased proportionately in the interests of convenience. For a thousand ton plant, it may be 4 tons (to last for about 5 minutes crushing). In the case of rail cane each wagon should be arranged
to be filled by cane belonging to two neighbouring ryots who grow the same variety and whose soil and cultivation conditions are as far as possible similar. The analysis of composite juice sample from the canes in the wagon has to be made applicable to both the ryots. The issue of cutting orders has to be so arranged that one acre of produce belonging to an individual is sent to the factory in a maximum period of 15 days, supply being continuous till the field is cleared. The number of samples to be analysed may be limited to four per acre from the same field and juice sampling may be done only when cane is directly unloaded on to the carrier without stacking. Care has to be taken to see that four samples of the required size are got from each acre of sugarcane any time before it is completely harvested and their percent pol is to be estimated in the manner described below.

The Java Ratio calculated for a whole day of crushing may be taken as applicable to all the individual parcels of cane, for calculating their pol reading. Since pol percent crusher juice is estimated, the pol percent cane can be arrived at by multiplying this with Java Ratio in respect of each parcel of cane. The average pol percent cane for each fortnight will be worked out and cane parcels that recorded a substantially higher pol reading (say more than 1%) than this average will be paid a premium.

Pol percent cane may also be estimated by adopting a suitable equation such as the one recently suggested by Ramanayya and Ramachandramurthy 1954(11), in which refractometric brix of primary juice is used as an index of pol in cane. According to these authors this equation will be as follows:

\[ Y = 0.05x + 2.335 \]

where \( Y = \) pol % cane and \( x = \) refractometric brix. The limits of pol reading which earn a premium may be fixed with reference to the average quality of cane usually crushed in any particular factory each fortnight. Even though this is an approximate way of determining cane quality, it is expected that the emphasis on the quality of raw material will be increased and the atmosphere will change for the better. There is no need for introducing penalties for poorer quality canes because better quality is being paid a premium. Penalties tend to defeat the purpose of improvement in quality.

The financial implications of estimating quality of cane supplied in two tons (or more) lots each time was worked out in one instance in the case of a factory of 500 tons crushing capacity. The scheme was worked for about a week employing human labour. It seemed possible to sample juices, estimate pol and work out extra price etc., by spending about Rs. 6,000/- on the organization in a season of 120 days crushing even when all the cane lots supplied by each individual were sampled. To instil confidence in the minds of the cane suppliers, juice analysis has to be done by Government employees, and the system of calculation may also be scrutinized by the Inspectors of Factories. As compared to the profit that accrues by improvement in sugar recovery, the amount spent in estimating the cane quality has to be considered negligible (Table III).
This extra payment to individual suppliers for quality has to be, in addition to the bonus proposed to be paid for passing on surplus profits, due to enhanced sugar prices and general improvement in sugar recovery.

The top limit of the share of cane suppliers in the net price of sugar actually realised by millers, (excluding excise duty and direct taxes) may be kept at 70% taking into consideration both the basic price as also extra bonus offered by the factory owners. Since this is the maximum limit actually offered by the millers in the SISMA formula, it is expected it will be acceptable to them. Premium offered for quality cane supply to individual ryots, has to be paid by the factories in their enlightened self interest over and above this top limit, if necessary.

If this offer is backed by well planned cane development work in the factory reserved areas it will go a long way in steadily improving cane quality. Provision of material aids such as irrigation facilities, manures (in time) and implements is the best way of popularising cane development and stepping up yields of rich canes in any locality. It has to be remembered, that sugar is manufactured in the field and only extracted in a factory.

**SUMMARY**

Sugarcane is best paid on quality basis. Improvement in cane quality can be ensured only by payment of inducement to individual cane growers for supplying canes of better quality.

By paying attention to cane development work, cultivation of good quality sugarcane has to be encouraged in each factory reserved area. This work has to be carried on a planned basis. For this, complete information on the cultivation details of individual holdings has to be gathered. Wherever necessary, material aids in the form of fertilizers, irrigation facilities etc., have to be given to the cultivators by the factory authorities. Harvest control has to be instituted based on a quality survey of individual fields.

The basic price has to be fixed by recording actual observations on cultivators' holdings selected as per stratified random sampling method. The cost of cultivation, reasonable margin of profit, parity prices of other commodities needed by the cane grower, return to him when cane is converted into gur should also be taken into consideration while fixing this price. It should be only on a State level and Agricultural graduates should be entrusted with this work which should be a permanent feature.

Part of the extra profits realised by millers has to be passed on to the growers, depending upon the sugar recovery and duration of cane crushing. A formula linking duration of crush and percent sugar recovery has been proposed. It is suggested that the maximum share of the growers in the net price of sugar realised by millers may be kept at 70%.

A scheme for payment of premium to individual growers based on the quality of cane supplied has been suggested. The need for emphasis on the
quality of cane at every stage in deciding the basis for cane price payment is indicated.

**ACKNOWLEDGEMENT**

Thanks are due to the Sugarcane Specialist, Anakapalle for affording facilities.

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