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PRODUCER INCENTIVES AS A MEANS OF PROMOTING AGRICULTURE DEVELOPMENT: A CASE STUDY OF COTTON IN KENYA.

By

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1. Introduction

1.1. This paper was originally presented as Institute for Development Studies Discussion Paper No. 105 in April 1971. The author acknowledge gratefully advice received and accepts responsibility for all remaining errors of fact and judgement.

1.2 It is stated in the 1970-74 Development Plan that the Government is anxious to see cotton production expanded considerably. This policy is attractive for several reasons. First, the demand for lint for processing within Kenya is increasing rapidly as more textile mills come into operation and increasing quantities can be sold on the world market without difficulty. Second, the demand for cotton seed for crushing by mills in Kenya is increasing, this demand being derived from a rising demand for vegetable oils and oil seed cakes. Third, cotton can be grown in many of the more marginal areas of the Republic where there are few alternative cash cropping opportunities. An expanded production of cotton could, therefore, be an important means of increasing the incomes of many of the more underprivileged farmers in Kenya.

1.3. Despite this potential, cotton production has remained disappointing, current levels only slightly greater than they were in the late 1930s. The main reason for this is simply that with current standards of husbandry and prices farmers generally do not find it a rewarding crop to grow. For example, data in the 1969 Annual Report of the Cotton Lint and Seed Marketing Board (CLSMB) reveal that the average gross return per acre of cotton to the farmer was only about Shs. 81/- in 1969, implying a yield of around 160 lbs per acre of seed cotton, and Shs. 63/- in 1968. After deducting the costs of purchased inputs used which probably were very low, the average return to labour on this relatively labour intensive crop must be very discouraging. It is hardly surprising that in most cases farmers do not share the Government's enthusiasm for the crop.

1.4. Clearly, then, the essential requisite for increased cotton production in Kenya is for farmers to obtain significantly higher returns from cotton growing. This objective may be achieved by increasing average yields, raising the price of seed cotton to farmers or lowering the costs of inputs. Although there has been no marked technological advance in cotton production of the 'green revolution' type as there has been with maize for example, current average yields remain so far below .....-...

The potential yields which can be obtained from cotton varieties currently available that obviously the main constraint lies in poor standards of husbandry. The reasons for this state of affairs probably are a lack of knowledge and motivation on the part of farmers. The Ministry of Agriculture must be blamed for the poor standard of it's cotton extension service although this was inherited from the CLSMB which formerly operated it. It seems that not only are the processes of disseminating information inefficient but the extension agents themselves often lack the correct information on cotton production. The author consider that the lack of motivation stems primarily from low prices to growers for seed cotton. Low producer prices tend to set off a self perpetuating cycle: lack of motivation leads to poor husbandry standards leads to low producer returns and so on. Therefore, it is seen that the essential prerequisite to achieving increased cotton production in the short run simply means <u>better prices for seed cotton</u>. In the longer run, of course, further improvements in yields through raising husbandry standards will depend on the information available to farmers. However, price increases can be implemented immediately and the main objective of this paper is to seek ways and means of achieving this.

1.5. Even a preliminary examination of governmental policies in Kenya towards cotton in the past reveals so many glaring errors that it is considered instructive to list them even at this early stage. Some of these policies have been corrected partially or completely already but even in these cases, their harmful effects on the industry are likely to be felt for some time to come. These policies are listed below.

(i) Burdening an underdevelop agricultural industry with supporting its own development, extension and research expenses. Such overhead costs are properly borne by central government although a relatively well developed agricultural industry such as (in Kenya) coffee or tea can make a substantial contribution towards them. Now largely corrected by central government taking over these expenses.

(ii) Burdening an undeveloped agricultural industry with a high cost marketing board which in the past has provided few productive services. Partially corrected in that although the CLSMB still incurs high administration costs it does appear to be taking a more active role in processing and marketing the crop.

(iii) Imposing on the industry a co-operative marketing structure which was incapable of operating efficiently and, in some cases, was against the will of the growers. The correct role of govern-

ment is to promote and support the expression of growers to co-operate in marketing their products and not to impose a co-operative marketing structure on them. Partially corrected in that subsidies to certain co-op. unions have been curtailed and co-operative marketing is not being imposed in new areas unless there is a strong co-operative movement already in existence, e.g. Mwea.

(iv) Remunerating ginneries on a cost plus pricing formula which has resulted in excess profits being earned by ginners, production costs being excessively high and with ginning capacity remaining unrationalised. Not yet corrected.

(v) Effectively ignoring the fact that seed cotton produces the joint products of lint and cotton seed after ginning.[1] The growers' price for seed cotton has been set according to lint prices alone while cotton seed returns have accrued to the CLSMB uncorrected.

(vi) Issuing cotton seed for planting free of charge. This has led to considerable waste of seed. Partially corrected in that growers receive a price differential for seed cotton produced according to whether they received seed free or for a fee (still subsidised). This still means that the less efficient producer (i.e. producing less seed cotton per unit input of seed) is less induced to use seed efficiently than a more efficient one.

(vii) The withholding of revenue from producers. Thus during the Korean war boom considerable reserves were built up which were subsequently lost in trying to support the costs of development and research outlined in (i) above. If these funds had been passed onto producers, at least over a period of years (a) production would have been encouraged; (b) the absence of such large reserves would not have encouraged incorrect and wasteful financing policies. Uncorrected in that it seems to be a continuing policy of the CLSMB to build up large reserves during the past two years.

(viii) The lack of co-ordination between the production, processing and marketing agents and cotton researchers to ensure that on-going research is effective.

(ix) The outcome of the above 8 points is that in general cotton growers' returns have been substantially less than they could have been given lint and cotton seed prices.

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1. In fact a third product, linters, may be produced also. This can be used for rayon production for example.

1.6 What preliminary conclusions may be drawn from these experiences? First, the overhead costs of the development, extension and research type for a relatively undeveloped industry should be borne by central government. The time when such an industry is able to contribute towards such expenses needs to be carefully evaluated. Second, any statutory marketing organisation must perform it's services at a minimum cost to the grower. Third, a pragmatic attitude must be adopted towards co-operatives. It is all too easy for ideological arguments supporting co-operatives to override economic arguments against them. The overall objective must not be lost sight of which is to promote the welfare of growers. Fourth, cost plus pricing formulas must not be permitted to exist. Fifth, the costs and benefits of subsidising certain inputs must be carefully evaluated before such subsidies are undertaken. Sixth, where-ever feasible producers must be paid the full value of their produce. Seventh, to ensure that agricultural research is effective, research workers must be informed of research priorities.

1.7 Rehearsing the physical process which cotton production taken as a whole involves; the following stages may be defined:
(i) individual growers deliver seed cotton to collection points or direct to ginneries;
(ii) collected seed cotton is transported from collection points to ginneries;
(iii) ginneries process the seed cotton, producing lint and seed;
(iv) the lint and seed are sold and transported to the places of final utilisation. Effectively these may be textile mills or seed crushing mills in Kenya or points of exit from Kenya; for example, Mombasa. Each of these stages in the above production, processing and marketing chain will be considered in turn in subsequent sections.

1.8 The appropriate returns to the grower may be expressed by the following equation:

$$R_g = P_l a + P_s b - (C_{e,t} + C_g + C_{m,a}) \qquad (1.1)$$

where R_g = returns to grower in Shs. per unit of seed cotton
P_l = ex-gin price of lint in shs. per unit; i.e. the gross sale price net of any direct marketing costs incurred such as transport.
a = the lint out-turn ratio, normally expressed as a percentage with a range of about 20% to 35%; expressed in the equation as a decimal. For AR grade seed cotton of the varieties now grown in Kenya, a reasonable figure is 32%.

at a later date. Given that a national group of producers now is different to a group of products last year and certainly say five years ago, and given that it can be assumed that the great majority of cotton are likely to have a high time preference rate for liquid funds[5] probably greater even than a 'normal' social rate of discount commonly applied these days of about 8%, such a price assistance fund is very unlikely to be able to properly compensate a particular grower for the revenue which he foregoes now in the expectancy of being remunerated at a later date.[6] In fact most price assistance or stabilisation funds dont have this in mind and therefore are misnamed. Their objectives usually are:-

(i) to act as a source of development funds, not necessarily for the particular sector in question;

(ii) to siphon off excess 'profits' in times of high product prices to prevent the entry into the industry of many producers marginal in (a) the technical sense of being able to grow the product only with such a high price or (b) with a high opportunity cost which the high product price overcomes, implying a reallocation of resources into production. If product prices subsequently fall then these resources may well prove to be misallocated and waste may occur; the bigger and more rapid the fall, the more likely is it that resource mis-allocation will occur. There may be a case for a small reserve fund to be set up (a) to allow for errors in trading expectancies; (b) to smooth out the annual variations in product prices which can occur. This point will be examined more closely below.

1.15 This reserve fund currently is financed out of growers' incomes. Under the present pricing policy all other agents concerned with the cotton crop are reimbursed their operating costs and receive their theoretical profits whether product prices rise or fall. This is unequitable although on economic grounds it would be difficult to say how the industry's divident should be shared. In the circumstances, rather than recommending any arbitrary profit or loss sharing scheme, it was recommended that growers' returns and ginners' margins should be fixed according to forecast product and prices and estimated costs of processing and marketing on an annual basis.

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5. Alternatively this may be termed the consumption rate of interest

6. There are 'traditional' counter arguments in favour of price assistance funds, being essentially the reduction in price uncertainty facing small scale producers with low risk bearing capacity. See D.G.R. Belshaw, Price and Marketing Policy for Uganda's Export Crops: the Reports of the Cotton and Coffee Committes 1966/67. Draft paper presented at the EAAES Conference, June 1968.

partially offset by an increase in seed price and vice-versa. Data presented in Table 1.1 shows that the ratio of average lint price to average seed price has varied from about 9.1 to 16.1 during a ten years period and the technical coefficients, a and b, are related in the ratio of approximately 1:2. Taking these together a change in seed price on growers returns would have the same effect as a change in lint price in the ratio of 45:1 to 8:1. In other words a 10% change in P_s could have the same effect on R_g as a 1.25% to 2.2% change in P_l. Such a change in P_s could have a stabilising on destabilising effect on growers returns.

1.10. Table 1.1 shows the average lint and seed prices (AR grade) during the period 1959/60 to 1968/69 and how average revenue derived from these two joint products has varied accordingly.

Table 1.1

Average lint and seed prices (AR grade) and average revenue, 1959/60 to 1968/69

Year	Lintprice Shs/Kg.	Changeover previous year %	Seed price Shs/Kg.	Average revenue* cents/Kg seed cotton	Change over previous year %
1959	5.76	-	0.38	209.40	-
60/61	5.02	-12.8	0.42	188.36	-10.0
61/62	4.70	-6.4	0.30	170.20	-9.6
62/63	4.44	-5.5	0.41	169.14	-0.6
63/64	4.77	+7.4	0.33	174.42	+3.1
64/65	4.51	-3.4	0.40	170.72	-1.9
65/66	4.15	-8.0	0.46	163.16	-4.4
66/67	4.04	-2.0	0.45	158.98	-2.6
67/68	4.72	+16.8	0.50	184.04	+15.8
68/69	5.47	+15.9	0.52	209.36	+13.8

Note* Based on the equation: Average revenue = 0.32 P_l + 0.66 P_s
Thus in only two years out of the 9 compared was the change in average revenue greater than that in lint price. During this period lint and seed prices taken together tended to have a stabilising effect.

1.11 Is it possible to make predictions on the relative movements of lint and seed prices? Given that Kenya is effectively an open economy with regard to these two products, it would be difficult to support the argument that downward movements in lint prices

would be followed by upward movements in seed prices (and vice versa) which would be the case if the Kenya economy was closed.[4] and notwithstanding the slim supporting evidence presented in Table 1.1. Kenya is a price taker on the world lint market and effectively a price taker on the world market not for cotton seed alone but for all substitutable oilseeds. Therefore there is no reason to argue that compensatory price movement- would be the rule although during the past decade or so, they appear to have been so in most years.

1.12. Returning to equation 1.1 and footnote 3 again we see that growers returns are directly and inversely affected by the costs of seed cotton collection and transport, ginning, marketing and administration. Thus a 10% change in any of these costs will change growers returns by a same amount but in the reverse direction.

With the current pricing policy for seed cotton, in the face of fluctuating prices for the final products the producer is the sole agent in the whole production, processing and marketing chain who gets varying returns. In practice the effect of fluctuating prices on producer returns is cushioned by the presence of a price assistance fund. Thus equation (1.1) becomes:

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[4] In the case of a closed economy for cotton lint and seed the following argument would apply.

Assuming $Qs_l = -a + bP_l$ (supply function for cotton lint)

$Qs_s = 2Qs_l$ (supply function for cotton seed in joint supply with lint)

$Qd_s = c - dP_s$ (demand function for seed for processing)

where Qs and Qd refer to quantity supplied and demanded respectively and subscripts l and s refer to lint and seed respectively.

For equilibrium:

$$Qs_s = Qd_s$$

$$\therefore 2(-a + bP_l) = c - dP_s$$

$$P_l = \frac{c - dP_s + 2a}{2b}$$

$$\frac{\alpha P_l}{\alpha P_s} = \frac{-d\ (2b)}{4b^2}$$

$$= \frac{-d}{2b}$$

$$\therefore \frac{\alpha P_s}{\alpha P_l} = \frac{2b}{d}$$

As both b and d > 0, the negative sign shows that as P_l increases, P_s decreases and vice versa.

2. Production, processing and marketing of cotton: a stage by stage examination-

2.1 The price which the grower receives for seed cotton is set by the Ministry of Agriculture in consultation with the GLSMB. These prices (formerly differentiated by growing region but now uniform throughout the country) are published under a gazette notice usually in July of each e year and cover the following 12 month period. The gazetted prices are net and on a 'delivered to collection point' basis, there being currently no further deductions except for loan repayments. There used to be an export tax of 14.6 cents per 1 lb of seed cotton but this was removed with effect from the 1955/6 crop. A cess was imposed during the period 1966 to 1968 by the GLSMB of 2 cts and 5 cts per 1 lb of AR and grade respectively. This no longer applies although the GLSMB has the power to levy this cess if considered appropriate.

2.2 Two issues merit attention on growers returns. These are:

(i) should there be regional or zone differentials and if so what should be their basis?

(ii) should there be quality differentials and if so what should be their basis?

2.3 Regional or zone differentials. As stated above there are now no regional or ginnery zone differentials in producer prices for seed cotton of a similar grade. Such differentials would be economically justified (although there may be practical arguments against them) if:-

(a) seed cotton collection costs varied widely between regions or zones;

(b) some regions are substantially further from points of final marketing than others and therefore incur higher transport costs for the lint;

(c) there is a strong correlation between regions or zones and quality which would be reflected in the final prices for lint or seed;

(d) a necessary condition is that these regions or zones are well defined.

2.4. Seed collection costs. A major variable item of seed collection cost is transport. The relevant parameters determining this costs are (i) the current per ton mile transport rate which varies from about 50 cts in eastern and central regions to about 85 cts in western and

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2.4. Seed collection costs. A major variable item of seed collection cost is transport. The relevant parameters determining this cost are (i) the current per ton mile transport rate which varies from about 30 cts in eastern and central regions to about 85 cts in western and

lake regions; (ii) the average distance of growers from the ginnery. Thus far-spread growers in a high transport cost region should receive less than growers located close to ginneries in a low transport cost region. The advantage of adopting this policy is that cotton production would receive an incentive to be carried out in lower transport cost regions close to the ginneries. However, the actual cost differences in terms of say per kg of seed cotton would be very small and it might not be considered fair to make the location of the gin within a particular zone (which may well have been on an arbitrary basis) a factor influencing individual producer returns. It will be seen that the actual cost of transporting seed cotton varies from 0.05 cts to 0.085 cts per kg per mile. If differentials of at least 0.5 cts per kg are to be maintained, these zones could be fairly broad i.e. between 10 and 7 miles according to the cost of transport in the area. In other words in low transport cost areas to incur a 1 cent/Kg price differential the grower would have to be delivering to a collection point 20 miles from the gin; in a high transport cost region, to incur the same 'penalty', he would have to be at least 14 miles away. The advantages of introducing such a pricing policy are first some groups of growers are not, in effect, subsidising others; second, seed collection transport costs are automatically covered because the further the ginner would have travel to obtain seed cotton, the less would be the minimum price he would have to offer.[7]

2.5. Lint transport costs. The locational price differentials incurred on lint transport are those from ginnery to railway head and hence to Mombasa for export and to the textile mill if consumed locally. Most AR lint is exported and therefore a logical pricing starting point is Mombasa. Most BR lint is consumed in local mills and therefore is price - locationally indeterminate unless an export parity pricing policy is adopted for these sales. The same applies to seed of any grade as it is consumed locally. The actual road transport element from ginnery to railhead in lint transport costs can be ignored in most cases at the seed cotton level because about 3 kg of seed cotton are required for the production of 1 kg of lint and the costs must be discounted accordingly. The exception is the transporting of lint from Lamu to Mombasa by road which costs about shs 16/- per bale of 185 kg. This would imply a transport cost of 3 cents per kg of seed cotton. There is a favourable railway tariff (scale 10) for lint for export. Examples of costs are shs 10.45 and shs 3.00 per 100 kg from Kisumu and Voi respectively

7. The standard economic argument [illegible] uniform pricing for growers based on the intensive - extensive margin of production issue, is not an easy one to put over to technically orientated policy makers. The farmers, though, usually appreciate the cross subsidisation argument while policy makers realise that transport costs have to be covered somehow. See appendix

to Mombasa. In terms of seed cotton with an average out-turn ratio of 33%, this is 3.5 cents and 1.0cts per Kg in these two areas, a noticeable differential. It was recommended that for a particular region, for example Coast, Eastern, Central, Western/Nyanza, the growers' price for AR seed cotton should be based on the estimated export parity price for AR lint and seed in that region (i.e. the estimated f.o.b. Mombasa price less handling and transport costs). If local sales are made (in fact all seed is sold locally) there will be no problem in applying this recommendation providing that the into textile mill or crushing mill price is equal to at least the prevailing export parity price for that region. In fact the selling price for local sales could be anywhere between the prevailing export or import (from Uganda) parity prices, the first setting the floor (from the seller's view point) and the second setting the ceiling (from the buyer's viewpoint). In practice, though, these prices are very close together.

2.6. Quality or grade differentials. This issue refers to the AR/BR grading system applied at the collection posts and which is based on quality in terms of insect or rain damage and not on the technical or physical properties of the cotton staple. The grading achieved is to a large degree dependent on the farmer himself. Some price differential is justified because (a) there is a differential between AR & BR lint and seed prices; (b) BR lint has a lower out-turn ratio. On the other hand costs of collection and marketing are the same for AR and BR grades. While it seems that the cost of ginning BR cotton is higher than for AR because it takes more time the difference is not very great according to Uganda data, equivalent to 0.25cts/Kg seed cotton.[8] The current grade differential in growers' prices is about 55 cents per kg (shs 1.10 per kg of AR; 45 cents per kg BR). Is such a differential economically justified? Referring back to the seed cotton pricing equation (1.1), the AR/BR grade differential may be calculated in the following way assuming that C_t and $C_{m,a}$ are the same for both grades:[9]

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8. Report of the Commission of Inquiry into the Cotton-Ginning Industry of Uganda, Govt. Printer, Entebbe 1962. Appendix X1. The figures quoted suggest a difference of about 0.75 cts/lb of lint ginned which is equivalent to about 0.25 cents/Kg of seed cotton. However data for only 3 gins is presented in a way that AR/BR ginning costs can be separated and in one of them, AR ginning costs appear to be higher than BR but this might be an error.

9. Strictly speaking $C_{m,a}$, the cost of marketing and administration in terms of a unit weight of seed cotton, should be slightly less for BR grade than AR grade in the ratio of $\frac{a(BR)}{a(AR)}$ because more BR than AR seed cotton is required to produce the same amount of lint of the respective grade. The same applies to ginning costs. As the ratio is very small in practice, about $\frac{0.29}{0.33}$, it is not worth worrying about.

$$R_g\ (AR) - R_g\ (BR) = (P_l a + P_s b)_{AR} - (P_l a + P_s b)_{BR} \qquad 2.1$$

Looking at each of the variables on the right hand side of the equation in turn, the difference in P_l, the lint price, between AR and BR grades was shs. 1.76 per kg in 1969 although this difference has varied between shs 1.87 to about 95 cents per kg during the period 1964 to 1968. The difference in a, lint out-turn ratio, is of the order of 3%, i.e. 32% for AR grade and 29% for BR grade. Thus Δ a is about 0.03. The difference in AR and BR seed prices also varies from year to year.

In recent years it appears to be widening to about shs 200 per metric ton from about shs 150 - 160 in 1966/67. The figure of shs 200 will be taken, i.e. 20 cents per kg. There may be a slight difference in the quantities of AR or BR seed obtained from say a kg of AR or BR seed cotton, but most of the differenee in lint out-turn ratio is accounted for by a higher wastage figure for the BR grade. Therefore this will be ignored.

Rearranging equation 2.1 and allowing for the difference in ginning costs between the two grades:

$$R_g(AR)-R_g(BR)=P_l a(AR)-P_l a(BR)+b\left[P_s(AR) - P_s\ (BR)\right] - \Delta C_g(AR,BR) \qquad 2.2$$

where, as stated in paragraph 2.6 above, normally Δ Cg $<$ 0 because Cg(AR) $<$ Cg(BR). Therefore inserting the above values we get:

$$\begin{aligned}\Delta R_g(AR,BR)\ \text{shs} &= (4.84\text{x}0.32)-(3.08\text{x}.29)+(0.66\text{x}0.20) + 0.005\\ &= 1.550-0.895+0.132+0.005\\ &= 0.655+0.132+0.005\\ &= 0.792\end{aligned}$$

The conclusion which may be drawn is that given recent prices for AR and BR lint and seed and using realistic lint and seed out-turn ratios, the current AR/BR seed cotton price differential is too narrow. On the other hand it seems that during the last few months the prices of BR lint have been such that the differential between the AR & BR grades at the growers' level could be narrower still. However this does not affect the recommendation made that there should not be a fixed and arbitrary price differential between AR and BR seed cotton but the price for each grade should be calculated separately on estimates of market prices for AR and BR lint and seed.

2.7. In Section 1.14 above it was stated that price assistance or stabilisation funds tended to operate against the interest of cotton growers who would be expected to have a high time preference rate

for liquid funds.[10] They may be justified (a) to provide a reserve against inaccurate forecast of market prices; (b) to prevent very violent price fluctuations from causing misallocation of resources either into or out of the industry. In fact if temporarily lint and seed prices were such that growers prices were very encouraging for new marginal entrants into the industry, a tax could be imposed to siphon off these 'excess' earnings which could be termed a windfall gain. On the other hand chronically depressed prices would leave the government with the following choice: either allow the industry to contract or to subsidize it. Therefore the resource allocation argument for creating a price assistance fund is not very strong. Additionally by introducing a pricing policy whereby other agents in the processing and marketing chain share the ups and downs of the prices of final products and not just the grower of seed cotton, this too will have a dampening effect on fluctuations in growers' returns. In 1968/69 the CLSMB achieved a net surplus of £113,378, equivalent to about 17.5% of total payments to growers in that year, and the only reason for a smaller surplus during the last trading year is higher costs. Surpluses of these magnitudes are considered to be excessive, can lead to wasteful administration and would be far better in the growers' hands. The issue of the level of working capital needed by the CLSMB to carry out its functions will be discussed in a section devoted to the Board but it does seem that only a relatively small reserve fund is required to overcome errors in price forecasts, say about 5% of the total annual payout to growers. This would imply a figure of say £ 35,000 to £ 50,000. It was recommended that as a matter of principle the CLSMB or its successor should pass onto the grower the largest possible portion of the value of the cotton crop implying that the size of its trading surpluses will be minimised. The other implication of course is that the marketing agency makes accurate forecasts of lint and seed prices.

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10. To be absolutely fair on this issue, if the trading surpluses and losses of the CLSMB (i.e. removals from and additions to growers' returns respectively) are added up from, say, 1954/56 to the 1969/70 and assuming a trading surplus of £ 200,000 during this last year, a total net 'benefit' of about £96,000 will have been received by growers over that period. Compounding at 8% gives a net 'benefit' of nearly £131,500. On the other hand this was possible simply because considerable funds were accumulated during the period up to 1955/6 so that if this calculation was extended back over a longer period, there is no doubt that the 'costs' would have exceeded the 'benefits'. Again, the presence of such substantial funds permitted growers' prices to be topped up in times of relatively low lint prices without having to make other economies in the processing and marketing chain.

2.8. It might be advisable to summarise briefly the foregoing section. The overall objective is that given prices for lint and seed, growers returns should be maximised and that there should be no subsidisation of one group of producers by another nor by one grade of seed cotton by another.[11] A simple equation can be used to calculate growers' returns from forecasts of lint and seed prices, and given estimated average costs of seed cotton collection and transportation, ginning and overhead marketing and administration.

The growers returns would be on a regional basis depending on the average quality expected from the region (it being difficult to apply quality premia on an individual grower basis) and on the propinquity of the region to consuming areas which, in turn, may be worked back to an export parity price. Seed cotton prices for AR and BR grades should be calculated separately on the basis of expected prices for AR and BR lint and seed and they may have a transport deduction made according to the distance of collection points from ginneries. Forecasts and estimates of prices have been mentioned frequently. It is one of the main functions of the CLSMB or its successor to make such forecasts and to make them as accurately as possible. Inevitably errors will be made in these forecasts which the presence of a small trading reserve may not overcome. Given that growers' prices must be made in advance of planting, mid seasonal adjustments may have to be made or simply the adjustment is made in the following year's price. It is up to the CLSMB to decide which of these two strategies is the most practicable and less discriminatory between individual growers. In order to restore and maintain grower's confidence in the crop it might be considered advisable to determine growers' prices for periods of up to 3 years or so. The main disadvantages of such a scheme are that if the marketing board is held responsible, then a very conservative price is likely to be determined; if the Government guarantees it, then the marketing board may be unduly optimistic. Certainly its success or failure depends largely on the accuracy of the marketing agency's long term price forecasts.

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11. In fact if estimated 'normal' ginning costs are averaged over the country rather than for each ginnery, some cross subsidisation does remain; that is growers supplying more efficient ginneries are subsidising growers supplying less efficient growers if a uniform growers' price is paid.

3. The collection and transportation of seed cotton

3.1. The physical process of this stage of cotton production is as follows. The grower delivers seed cotton to collection points where it is weighed and graded into AR and BR grades. the grower receiving the gazetted price. The bagged seed cotton is then stored until transported to the ginnery. Normally the ginnery would act as its own buying agent or hire agents to work on its behalf and this is still the case of ginneries at Kitui and on the coast. Elsewhere in Nyanza and Western Provinces and, more lately, in Central Province, cotton co-operative societies were formed to act as buying agents. In all Nyanza and western areas these primary societies were grouped into various Unions but this has served little purpose yet has raised the costs of buying and transporting. Two unions subsequently were suspended and currently Nambare and Malakisi ginneries deal directly withe the primary societies. The names of the remaining unions and the receiving ginneries are as follows:

Rachuonyo FCU - delivering to Kendu Bay ginnery
Bondo/Ukwala FCU- " " Ndere Ginnery
Luanda FCU - " " Samia ginnery
Kisumu FCU formerly delivered to the Kibos ginnery but now delivers to Ndere.
Victoria FCU formerly delivered to the Homa Bay ginnery but now deliver also to Kendu Bay.

3.2. Two issues have to be resolved. What is the appropriate role of growers co-operatives in seed cotton buying and how should buying agents whether they are the ginneries themselves, private individuals or co-operatives be remunerated? They will be considered in turn.

3.3. The role of co-operatives in seed cotton buying. One of the terms of reference of the Working Party for which this paper was originally prepared was concerned with the whole role of the co-operative movement in the cotton industry. Therefore this issue was discussed at some length nor really justified here. The main conclusion reached was that if primary societies were able to provide to all cotton growers in an area an adequate service of collecting and, if necessary, transporting seed cotton at a competitive cost, then their activities could be promoted. In fact the primary societies proved to be

reasonably efficient (at least they seem to be able to survive with the fairly generous commission paid to them - see following paragraph); the co-operative unions were not, providing few if any additional services while receiving a commission separately negotiated with the CLSMB. For example, the buying commisions payable to unions (as opposed to societies) for the current buying season are as follows:

Table 3.1

Buying commission payable to unions 1970/71

Name	Ginnery	Commission cents/Kg
Rachuonyo	Kendu Bay	7.32
Victoria	" "	8.29
Kisumu	Ndere	12.67
Bondo/Ukwala	Ndere	6.70
Luanda	Samia	7.03

The difference between these costs may be explained partially by different transport costs involved. For example both Victoria and Rachuonyo FCUs deliver to Kendu Bay but the former union used to deliver to Homa Bay ginnery (now mileneed) and therefore is likely to incur additional transport costs - Kendu Bay is some 20 miles from Homa Bay. If a reasonable transport charge is 85 cents per metric ton mile (0.085 cents per Kg mile) then the extra costs incurred on average will be 1.7 cents per Kg. The difference between Victoria and Rachuonyo commissions is 0.97 per Kg. implying that Rachuonyo FCU is possibly incurring higher collecting costs then Victoria FCU.

In fact the commission paid by the CLSMB to the Unions is not consistent but depends mainly on the size of crop handled by each union. A Union with a relatively low 'throughput' tends to have a higher commission per unit of seed cotton than one with a high throughput because the costs of administration are essentially fixed and have to be covered somehow. It was considered that it was not a function of the CLSMB to subsidize individual unions in this way but to reimburse them for the services provided on a consistent /

basis.[12] If individual Unions could not survive under such a policy, this would be matter for consideration by the Department of Co-operative Development. Amalgamation of small, non-viable Unions with each other or with adjoining larger ones may be a solution in these cases.

3.4. The remuneration of seed cotton buying agents. Buying agents, whatever they are, receive a commission from the CLSMB, the standard rate being 4 cents per Kg payable through the ginneries to which deliveries are made. If ginneries act as their own buying agents then they receive this commission directly. If seed cotton collection is undertaken by co-operative unions as opposed to primary societies then, as we have seen, an additional commission is paid although this is partially offset by the unions undertaking the transportation of seed cotton to the ginneries. In addition the ginneries are responsible for various expenditures incurred in buying seed cotton and they are reimbursed under the Lint Price Formula. The first 19 items of this Formula cover buying at the ginnery or store. With the demise of the Lint Price Formula (see section 4) some means has to be devised of remunerating buying agents. This problem only arises when these agents are economically distinguishable from the ginnery owners. When the buying agents are employed by the ginnery then there is no problem because the costs of buying and transportation would come within the margin between the growers' price and the prices received by the ginnery for the final products. Thus the buying function can be considered part of the ginning function and rightly so. It is in the interests of the ginnery owner to attempt to operate at an economic throughput and therefore has an incentive both to promote cotton production in his catchment area and make the collection process as efficient as possible. However when, for example, co-operative societies purchase on behalf of private ginneries, then to prevent these ginneries exploiting their monopsonistic position, a buyers' commission has to be determined. It is considered that the setting up of a separate buying structure such as growers co-operatives between growers and ginneries is a retrogressive step in terms of the promotion of the efficiency of the collection and delivery of seed cotton. Growers are protected from exploitation by ginneries by prices being set by the CLSMB and therefore there is no need for them to co-operate as a means of creating countervailing

12. If growers' prices are on an into-ginnery basis then such commissions would be included in the margin between this price and what the grower actually receives. See 7. Para 2.4 and Appendix.

power.[13] Buying co-operative will have an incentive to maximise their collections but will be far less directly concerned with the efficiency and timeliness of deliveries. Therefore this buying and ginning dichotomy must be regarded as only an intermediate stage in the development of the cotton industry. There appear to be two separate issues. The first is how to cover the actual buying costs - buyers' remuneration, stores rent and repair, scales, gunnies, twine and transport of cash; the second is the transportation cost from stores to the ginnery. Each will be examined separately.

3.5. Buying costs. These may be divided into fixed and variable. The first will be buying licenses, store rent and repairs, scale depreciation (ignoring the variable wear element) and transport cost of cash. Variable will be gunnies and twine used and insurance of cash. Buyers' remuneration could be regarded as a fixed cost. An examination of the quantities of seed cotton purchased from co-operative society stores serving the Nambare ginnery in 1969/70 reveals that the range was from about 56,000 to 176,000 Kg (excluding purchases made at the ginnery itself. If the buying commission was at a rate of 4 cents per Kg. this would imply a buyers' income of from shs. 2240 to shs. 7040 for a 5-6 month buying season. This would appear to be rather high. Therefore it was recommended that either those commission rates could be maintained but buying agents would have to bear all buying costs involved or that they could be reduced, the ginnery providing gunnies, twine, scales etc. The simplest course, which will be discussed in a following section, is for co-operative societies to have an interest in the ginnery itself when this division between the buying and ginning functions will be erased. If it was considered that co-operative societies would be unable to perform the collection function if the commission was reduced or effectively their costs were raised and this would be detrimental to growers' long run interests, it might be necessary to continue the 4 cents/Kg commission for the time being without requiring societies to bear additional buying costs. This argument could be supported on 'infant industry' grounds. However, in

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13. On the other hand if the collection of seed cotton is undertaken by co-operative societies there is less likelihood of seed cotton being unfairly downgraded than if ginneries operated their own collections. All these sorts of problems should resolve themselves when co-operative societies and hence member growers have a financial interest in the ginning function itself although presumably non-member growers could still be discriminated against.

these cases the inputs provided by the ginners towards the buying function would have to be included in the 'normal' ginning margin allowed and this would lead to extra complications.

3.6. Transport costs. Again this is most effectively organised by the ginnery itself and if co-operatives can obtain a share in ginneries then the co-operatives and ginneries interests will coincide: namely to deliver seed cotton as cheaply and efficiently as possible.[14] Under section 2.4 above, seed cotton transport costs were considered. It was recommended that growers should, in effect, pay for the costs of transport by receiving prices according to the distance between the delivery point and the ginnery. Thus, the greater the distance, the lower the price. If this price differential is geared to the transport cost on a zone basis, then as the seed cotton catchment area becomes wider, so the ginning margin (i.e. ginners revenue less value of seed cotton purchases per unit handled) will tend to widen also. In other words transport costs will be automatically covered if growers' prices are zoned according to the distance of collection points from ginneries. Therefore if the recommendation made under section 2.4 is not followed, the whole series of problems emerges on how to reimburse transport agents whether they are co-operatives or ginnery owners, how to assess transport costs and how to ensure that transportation is being performed at least cost.[15]

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14. It could be argued that one of a large group of societies having an interest in a ginnery could be a high cost seed cotton collection agent without significantly affecting its profits obtained from its share of the ginnery.

15. It does not make any difference whether growers prices are gazetted on an 'at collection point' basis with collection and transport margins added or on an 'into-ginnery' basis with these margins deducted.

4. Ginning.

4.1. Some of the most intractable problems facing the cotton industry in Kenya lie within the processing stage of the crop, that is ginning. The three main problem areas are first, how should ginnery owners be remunerated; second what should be the ownership and management structure of ginneries; third how to rationalise ginning capacity in the country to ensure that these resources are being efficiently utilised.

4.2. The current ginning capacity and ownership situation is presented in the following table.

Table 4.1

Current ginning capacity, utilization and ownership, Kenya

Name	Ownership	Capacity	Throughput
Western/Nyanza		Bales	in 1969 season
Nambare	CLSMB	6000	3849
Malakisi	Produce Dealers & Millers	5000	2685
Ndere	Kenya Industries Ltd	5000	1420
Kibos*	CLSMB	3500	-
Samia	Small & Co.	8000	2505
Kendu Bay	"	5000	1837
Homa Bay*	"	5000	-
Sub Total		37500	12296
Eastern Kitui	Abdulali Jiwaji	8000	8490
Coast Malindi	Malindi Ginners Ltd	9250	609
Lamu	Lamu Ginners Ltd	3000	1592

* Ginnery temporarily silenced.

There is also a ginnery recently opened at Mwea, jointly owned by the CLSMB and the Mwea Co-operative Society. The 1970/71 season, not yet completed, is its first.

4.3. Ginners remuneration. The joint products of seed cotton processing are cotton lint and seed. Under free market conditions the revenue derived from the sale of these products would accrue to the ginneries and this sum, less the cost of seed cotton purchased would constitute the ginners gross margin. The current policy of the CLSMB is to remunerate ginners on the basis of a Lint Price Formula originating in Uganda and used in Kenya since 1956. This is essentially a cost plus formula with ginners being reimbursed all expenses under 55 separate headings based on estimates of costs incurred in a "hypothetical" ginnery of an output

of 2400 bales of lint per season (1500 in the case of Lamu) plus two heads of 'profits' for the buying and ginning function: ½ cent and 5½ cents per lb of lint respectively. The CLSMB stipulates average lint out-turn percentages to calculate the number of bales of lint and quantities of seed expected from the deliveries of seed cotton. The calculated ginning margin per lb of lint produced is then added to the seed cotton price also expressed in terms of lint and this amounts to the ex-gin price. Additional (arbitrary) allowances are given for BR lint which has a lower lint out-turn percentage and higher ginning costs. Cotton seed is not paid for by the CLSMB except weighing and bagging costs and a commission for handling of seed used for planting purposes.

4.4. It is difficult to criticise in strong enough terms this administratively burdensome, highly inefficient and completely arbitrary cost-plus pricing formula. Suffice it to say that it has resulted in high profits being earned by ginners which explains the present excess capacity in the industry. In 1968/9 Nambare ginnery acquired by the CLSMB the previous year and therefore without much experience behind them, achieved a net profit of about £8,300 excluding profits on transportation, on an investment of £30,000. The budget for 1969/70 for Nambare forecasts a trading profit of about £ 16,000 mainly because of increasing throughput. It was recommended that the lint Price formula should be abandoned forthwith.

4.5. An amendment proposed by the CLSMB is to simply pay ginners at a rate more in line with actual costs incurred at the CLSMB ginnery at Nambare. The suggested ex-gin lint price is shs. 1.85 per lb (shs. 4.07 per Kg) which is comparable with that pertaining in neighbouring countries and a saving of about 15-20 cents per lb (shs 32-44 cents per Kg) over current prices. It implies a ginner's gross margin of about 24.5 cents per Kg of seed cotton.[16] This proposal does have the advantages of being administratively simple and of reducing the ginning margin but is not theoretically efficient.

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16. This may be simply calculated from the following:

$$G_m = aP_l - R_g$$

where G_m = ginner's margin in cents per unit weight of seed cotton.
P_l = ex-gin price of lint in cents per unit weight.
R_g = growers return in cents per unit weight of seed cotton.
a = lint out-turn ratio.

Thus $G_m = 407(0.33) - 110$
$= 24.5$ cents per Kg or just over 11 cents per lb of seed cotton.

4.6. The main objectives of a pricing policy applied to ginning should be to (a) reduce ginners margins so that profits are less excessive; (b) to increase throughput so that ginning resources are more efficiently utilised (average costs of ginning are reduced); (c) unless there is a good case for supporting them, to permit uneconomic resources involved in ginning to transfer to alternative uses. The main problems are that first there is not a great deal of information readily available on the cost functions of ginning in Kenya[17] (CLSMB have only 3 years' experience gained at Nambare and this was to some extent a learning process); second ginners have to pay a fixed price to producers and therefore find it difficult to increase throughput. A preliminary examination of Nambare ginnery's costs shows that ginning variable costs (including purchasing of seed cotton) is almost constant over a wide range of output implying that average costs are still falling - (in 1968/9 Nambare operated at about 60% of capacity: this is expected to rise to 75% during this current season). This ignorance of true ginning cost functions in Kenya (those gathered in the past for the Lint Price Formula calculations are not likely to be 'true') is a serious handicap to evolving an efficient formula for remunerating ginneries. However, some suggestions can be made and these are put forward for consideration.

4.7. (i) Ginners should be paid both the lint and seed produced and not the lint alone. It is quite erroneous to pay ginners for only one of the joint products produced. Ginning costs are incurred to transform raw cotton into lint and seed.

(ii) Somewhere the overhead costs of administration and marketing have to be borne by the industry. That is, there has to be some administrative and marketing structure even if marketed output is very low and the size of this structure would not be expected to vary significantly over a fairly large range in marketed output of the industry. Also, of course, these truly overhead costs cannot be allocated between the joint products of lint and seed, nor should they be. Two alternative approaches are suggested as follows.

4.8. The Lump Sum approach. Here these costs are regarded as an overhead charge which is divided up between ginneries according to their rated capacity as a form of lump sum 'tax' e.g. shs 30/- per bale of rated capacity although this would vary according to the total capacity of the industry and the total overhead cost. On the other hand the

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17. As might be expected there is some fairly detailed information available on ginning costs in Uganda. For example see the 1962 Report of the Commission of Inquiry into the cotton-Ginning Industry of Uganda, op. cit. Unfortunately the cost data given in Appendix XI of that report is not linked with any information on throughput.

only deductions made to ex-gin lint & seed prices would be the true allocable costs of marketing lint and seed; e.g. transport and handling. In this approach, the ginners monthly, say, returns would be according to the following equation:

$$G_p = xP_l + yP_s - S \qquad 4.1$$

where G_p = monthly payment to ginners in shs

x = quantity of lint produced at ex-gin price P_l

y = quantity of seed produced at ex-gin price P_s

S = lump sum tax divided up into monthly instalments over the ginning period.

Ginners gross returns in terms of seed cotton processed will be according to:-

$$Cg' = a' (xP_l + yP_s) - \frac{S(a')}{x}$$

$$= a' (xP_l + yP_s - \frac{S}{x}) \qquad 4.2.$$

where the new variables are

Cg' = actual ginners returns

a' = lint out-turn ratio obtained.

and assuming $y = x \frac{a'}{b'}$, where b' is the actual seed out-turn ratio obtained.

Clearly Cg' will increase both as a', the lint out-turn ratio and x the quantity of lint produced, i.e. throughput, increase. This is desirable. This approach also is administratively simple because the only ginning variable which the marketing agency has to estimate annually is S, the fixed charge.[18]

4.9. The average cost approach. Here overhead administration and marketing costs are averaged over the crop handled (in terms of seed cotton of course to avoid the problems of allocating them to either lint or seed) and therefore are regarded as a form of specific 'tax', a deduction being made from the ginners' margin per unit of seed cotton processed. True allocable costs again would be deducted from the ex-gin prices of lint and seed. According to this approach the ginners will be remunerated according to the following formula derived from equation 1.1 above.

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18. The ginners actual net returns per unit of seed cotton i.e. net of payments to growers, will be according to:-

Where $Cg' = a'P_l + b'P_s - \left[S(\frac{a'}{x}) + R_g \right]$

where R_g = price payable to growers per unit of seed cotton.

$$G_p = xP_l + yP_s - (C^*_{m,a})\frac{x}{a^*} \qquad 4.3.$$

where new variables are

$C^*_{m,a}$ = calculated average overhead cost of marketing and administration per unit of seed cotton.

a^* = stipulated lint out-turn ratio

Here the marketing agency has to calculate the average overhead cost requiring forecasts of both costs and crop size. Also a lint out-turn ratio has to be stipulated.[19]

4.10. From paragraphs 4.8 and 4.9 above it will be seen that the 'lump sum' approach has distinct practical advantages over the 'average cost' approach. It has also the theoretical advantage that the addition of a lump sum to a firm's costs will not affect its marginal cost curve. Thus a profit maximising firm facing a lump sum 'tax' will not alter its level of throughput . Again, a firm operating at less than the technical optimum capacity with this addition to overhead costs will have an incentive to increase throughput, i.e. reduce average overhead costs, or possibly go out of business. On the other hand, the average cost approach implying a specific tax, will reduce throughput if the ginner was profit maximising before[20] while if it was operating at less than technical capacity it will have a smaller or greater incentive to increase throughput depending on the shape of his average total cost curve.

4.11. This being said the author appreciated that, for the time being

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19. By this approach, the ginners actual net returns per unit of seed cotton processed will be according to:-

$$G_g' = a'P_l + b'P_s - (C^*_{m,a} + R_g) \qquad 19a$$

although, strictly speaking, he should get:-

$$a'P_l + b'P_s - \left[C^*_{m,a}\left(\frac{a^*}{a'}\right) + R_g\right]$$

because he will have processed $\frac{1}{a'}$ units of seed cotton to obtain one unit of lint but presumed to have used $\frac{1}{a^*}$ units. Thus if $a' > a^*$, according to 19a, implying greater technical efficiency, the ginner is penalised; if $a' < a^*$ implying less technical efficiency, the ginner benefits. This is not desirable.

20. With the lump sum 'tax', the ginner's profit is

$$G_p = R(q) - C(q) - S \qquad 20a$$

where G_p is his net profit and S is the lump sum 'tax'. Setting the derivative of 20a equal to zero

$$\frac{dG_p}{dq} = R'(q) - C'(q) = 0 \qquad R'(q) = C'(q)$$

at least, either of these approaches might appear to be rather too radical and there is the practical problem of a lack of actual ginning cost data. As the most important issue is to get rid of the present Lint Price Formula as rapidly as possible, a quick and practical approach would be to take the current Nambare ginning margins, apply them to the industry and see what happens. If ginneries threaten to go out of business then if it is in the national interest, individual ginneries could be bought out, subsidised or the overall margin raised. Although not necessarily the best solution this would be a pragmatic approach to solving the problem of rationalisation of current ginning capacity.

4.12. Pursuing this line further, it seems that Nambare's cost structure is as follows:

Overhead costs £ 10,700

Variable costs 19.7 cents to 11.9 cents per Kg as throughput increased from 2300 to 4500 bales per annum. However, these costs must be regarded as very tentative as they relate to three ginning seasons [illegible] to 1969/70, the latter being the budgeted costs. Yet these do seem to indicate that as output increases from about 30% to 75% of capacity, average fixed costs decline from nearly 16 cts to just over 8 cts per Kg of seed cotton. Average variable costs might be put at say 12 cents per Kg because the early figure obtained of nearly 20 cts probably was due to inexperience as much as anything. Allowing for 'normal' profits of say 10% on the capital invested when a throughput of 75% has been obtained would give an average total cost of production of 22 cents per Kg of seed cotton. The CLSMB recommends that the ginners margin should be reduced to 35 cents per lb of lint or 11.2 cts per lb

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20 (cont.) Thus S vanishes upon differentiation and the ginner maximises his profit by setting marginal cost equal to marginal revenue. With the specific 'tax' implied in the variable cost approach, ginner's profit now becomes

$$G_p = R(q) - C(q) - sq \qquad 20b$$

where s = specific 'tax'

and $\frac{dG_p}{dq} = R'(q) - C'(q) - s = 0 \quad R'(q) = C'(q) + s$

Thus the ginner maximises his profit by setting marginal cost plus the specific 'tax' equal to marginal revenue. As sale prices are predetermined by the marketing agency, throughput will tend to decline.

seed cotton at an out-turn ratio of 32%. This is equivalent to 24.8 cts per Kg. of seed cotton. Perhaps a reasonable starting point would be a ginners' margin 25 cts per Kg of seed cotton processed. This could be revised in the light of experience. Additionally when the CLSMB or its successor has control of all ginneries in a contiguous zone, it may allocate supplies of seed cotton between them to equalise their marginal costs.

4.13. It was recommended also that (a) ginners should be permitted to pay more than the target price to growers set by the CLSMB; (b) they should be responsible for remunerating collection agents, this cost being included in their margin although the minimum commission will be set by the CLSMB; (c) that ginners should provide their own working capital. The requirement for this will be minimised by the CLSMB paying ginners for lint and seed produced on a monthly basis and storage allowances would have to be paid for uncollected lint and seed. In fact recommendations (b) and (c) only would be confirming current practice but (a) would be something of a radical departure from it. The objective is to try to instil a modicum of competition in the ginning industry to obtain a rationalisation of ginning capacity and possibly enhance growers returns. The main argument against this recommendation is that ginneries owned by co-operatives with limited experience and funds could not engage in a price war with experienced private ginners backed up with considerable resources.[21] This is probably true in which case each ginnery could be given a zone in which it has monopsonistic powers but there would be outlying areas where competition could exist. In effect this would amount probably to ginners taking over the cost of transporting seed cotton and not the grower. Furthermore, again on infant industry grounds, co-operative ginneries could be protected by requiring them to pay a smaller lump sum or specific 'tax' than private ginners where there was competition between them.

4.14. The ownership of ginneries. As a matter of policy it is thought to be in the interests of cotton growers that they should have a financial interest in the ginning industry. However, co-operatives should be allowed to develop the capacity to manage them efficiently. Therefore it was recommended that any co-operative ownership of ginneries should be on a partnership basis with the Government through

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21. There is a long discussion of this issue in the 1962 Ugandan Commission of Inquiry, op. cit. See chapter V, paras 183-194 and chapter VI.

the CLSMB or its successor. With additional experience co-operatives may acquire complete control of ginneries. Ginneries should be purchased on a willing buyer - willing seller basis only in those cases where co-operative societies have sufficient membership to enable shares to be 'purchased' over a reasonable period of time. Additionally, the CLSMB or its successor should have the powers to purchase any ginnery offered to it.

4.15. Perhaps it needs to be stated that the recommended pricing policy is appropriate whoever owns the actual ginning resources. The CLSMB as a managing agent of a ginnery can be separated from its role as a marketing and administrative organisation. The co-operatives, too, in their own interests should not be permitted to earn excess profits as ginners on the argument that these will be passed back to growers. First, excess profits tend to promote waste, and second, as ginning companies, co-operatives will be liable to corporation tax and rightly so. Third, it is unlikely that ginneries will be exclusively owned by co-operatives for at least some time to come and therefore ginning profits will have to be shared with the CLSMB or its successor. Fourth, growers may wish to deliver to ginneries partially owned by co-operatives but they may not be members of them.

4.16. The purchase of ginneries. To avoid having to base the ginnery purchase price on an intrinsic valuation or replacement cost basis, it was recommended that the purchase price should be based on the estimated present value of expected profits over the outstanding life span of the investment. In addition to avoiding difficulties of valuation of assets, the stream of future profits should be based on pricing policies recommended for the future and not on past policies. Additionally evidence supporting claims under the previous Lint Price Formula would also provide evidence to support a ginnery buyers' claims that future profits, given the ginnery's cost structure and future price policies, would not be more than 'normal'. The rate of discount used in these estimates should be set at a current social rate of, say, 8%. The implication of this statement is that the CLSMB and the co-operatives should not enter into negotiations for the purchase of ginneries until the effects of the recommended changes in ginners' remuneration are known. Otherwise there might be the temptation to continue the present Lint Price Formula simply to keep these newly purchased co-operative ginneries in business. This should not be permitted.

5. The future role of the CLSMB.

5.1. The CLSMB has been a very high cost administrative and marketing structure for the services it has performed for the cotton industry. In 1968/9. CLSMB's expenses were £56,709, the crop being about 13.6 m Kg of seed cotton, or about 6.7 cts per Kg. In 1967/8 the cost was £ 58,460 for a crop of about 12.0 m Kg, or over 9.7 cts per Kg. These costs are far too high.[22] Its future role must be determined on what services it can undertake and what level of costs will be incurred. It has been suggested that the CLSMB could be remodelled along the lines of the Kenya Tea Development Authority (KTDA) but this is more a wish to see the CLSMB become a relatively low cost organisation for the services provided than suggesting that the adoption of KTDA type roles by the CLSMB would be in the interests of the cotton industry. The KTDA deals with a perennial, high value crop, concentrated into a relatively small area. The CLSMB is dealing with a dispersed, annual crop yielding under current levels of husbandry, a low income per grower. The KTDA approach was based on the already existing estate sector, non-existent with cotton. Additionally, green tea must be transported rapidly from the field to the factory and supervision and control of this stage of production by the central organisation is essential. This is not so with cotton. Clearly there are sufficient differences between the characteristics of these two crops to ensure that the organisations concerned with them differ also.

5.2. What sort of organisation is suitable for this currently £1m industry? (The tea industry generates a gross farm revenue of over £14m with the KTDA handling about 25% of the total). The main requirement is that it should be low cost and, in the short run anyway, its role should be suitably low-profile. The promotion and development of cotton growing is better left with the Ministry of Agriculture which now has taken over most of the costs of these services. There may be some overall interest taken in seed cotton collection but where the collection is undertaken by co-operative societies and Unions the

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22. In 1960/61 the Uganda Lint Marketing Board incurred administrative costs of £116,826 for a crop of 371,318 bales of lint. (See the 1962 Ugandan Commission of Inquiry op. cit.) With an average lint out-turn ratio of 32% this implies a crop of about 214.7m Kg of seed cotton and hence an average cost of 1.1 cent per Kg. These costs are dated by 7 to 8 years in comparison with the CLSMB figures quoted.

Dept. of co-operative Development is the proper organisation for their supervision, and otherwise the ginneries themselves should ensure that this task is performed as efficiently as possible. With the revised pricing structure it will be in their interests to do so. However, the CLSMB or its successor can perform its most useful roles in actively participating in ginning through the purchase and management of ginneries in conjunction with co-operatives, and in the marketing of lint and seed. In fact this last rle is its most important because additional ginning interests will be acquired probably only over a period of time and rightly so. Therefore it was recommended that the CLSMB or its successor should concentrate its activities on the marketingof lint and seed in the most favourable markets and forecasting market prices for these products.[23] Additionally where it is in the interests of growers or in the national interest to do so, the Board should purchase and manage ginneries until such time that they may be taken over by the co-operative movement.

5.3. It is invisaged that these limited roles recommended above would require a much smaller administrative structure than is in existence at the present time. This implies that the overhead administration costs could be very considerably reduced. The issue which remains is whether the CLSMB itself can undertake this review of its future roles in the cotton industry and the necessary structure required to undertake these roles or whether the Ministry of Agriculture should undertake it. Whoever the actual agent may be it was recommended that this review of the CLSMB's roles and the resulting appropriate organisation is undertaken with some urgency.

5.4. Although its reserves have been considerably depleted in recent years, the CLSMB presides still over a considerable stock of money: over £400,000 by the end of 1969 of which nearly £200,000 was in a relatively liquid form. During the 1968/9 year a gross trading surplus of nearly £147,600 was achieved and the surplus for 1969/70 could be greater

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23. Since November 1970 the CLSMB now markets lint through cotton brokers in Uganda. From November 1966 until this time, the Board had an agreement with Messrs Anderson Clayton and Hunt (Cotton Brkers) Ltd to sell Kenya's lint on a commission basis, more than £16,000 in total in 1968/9. Prior to that again the Kenyan crop was handled also on a commission basis, by the Uganda Lint Marketing Board. Therefore it can be said that only since late last year has the CLSMB played an active role in actually marketing the crop. Seed is sold by tender, usually in 100 ton lots. There are few buyers (in fact there are few seed crushing mills in Kenya) and therefore the formation of price rings or tendering-by-turn would be easy. Yet seed prices are generally above the estimated export parity price (little or none is exported) So one presumes that the system is working.

give. the level of lint and seed prices.

still / The question which must be asked are what are the purposes of these funds? Do they benefit the grower? It must not be forgotten that they represent returns withheld from growers. For a board like CLSMB funds can be designated for 3 purposes:-

a) to act as a trading reserve in cases of inaccurate market forecasts;

b) the acquisition of additional assets;

c) working capital.

5.5. It has been stated already that the role of the CLSMB in stabilising growers' prices should be minimised. The annual payout to producers, collectors and ginners should reflect the market prices of the final products but, given that producer prices need to be advertised in advance, price forecasts will have to be made which will be subject to errors. Therefore a small trading reserve fund (as opposed to a price assistance fund) is considered necessary to allow for such contingencies. The required size of this reserve depends mainly on the accuracy of the CLSMB sales forecasts. It is to be hoped that a sum of not more than say 5% of turnover need be required, say £ 50,000. This is not an annual sum to be set aside but the ceiling which need not be exceeded until growers' annual receipts are more than £1m.

5.6. The acquisition of additional assets. The form of these are most likely to be ginneries purchased in conjuction with co-operatives. Now if the CLSMB sets aside the greater part of its remaining reserves for this purpose, the profits earned from these investments net of tax will accrue to the CLSMB and not to growers who receive only the profits earned from their share of the total investment through co-operatives. In fact there is no reason why a particular group of growers should be favoured by receiving the returns on the capital invested by the CLSMB even if, strictly speaking, these funds rightly belong to all cotton growers in Kenya, or at least the previous generation of them. Clearly, though, given that investments of this nature by the CLSMB will be spread over a period of years and given that profits accruing from earlier investments may be accumulated for the purchase of additional assets later, the requirement for a very large investment fund for purchasing ginneries is not foreseen.

5.7. Working capital. One of the roles of the CLSMB is to act as a marketing agent of cotton lint and seed. It should act as a willing buyer of these products at declared prices which should be paid within at least a month of ginning. Although the actual ginning period of a single ginnery is relatively short, 6 months or so, because

cotton is grown widely across Kenya the period of time during which the CLSMB is purchasing lint is rather longer. The important consideration from the CLSMB's point of view is the lag between paying for lint and seed and selling them. With much of the lint going to overseas buyers, this lag may be fairly long although it should be offset by sales of seed and lint made locally. It does seem an unnecessary condition that the CLSMB should be made to provide all of its own working capital from its own reserves which would have to be kept in a liquid form for the this purpose. A wider use of the Sugar and Cereal Finance Corporation is recommended together with closer financial links with other boards in order to pool their working capital requirements. One of the implications of the foregoing discussion is that the CLSMB should not be responsible for financing the purchase of the seed cotton from growers. It may be of benefit to the industry to decentralise this activity and make this the responsibility of the individual ginners. Possibly ginners may opt either to receive a higher margin and provide their own working capital or to receive a lower margin, the CLSMB providing the necessary finance. Of course, the CLSMB as a ginnery operator should use its capital reserves in such a way to reduce its total interest payments. One advantage of such decentralisation is that commercial banks would be encouraged to play a more active role in providing finance for this particular sector of the agricultural industry in Kenya.

5.8. Investment and loaning policies of the CLSMB. It is considered that these deserve some criticism, the first for being unduly conservative and the second for being too generous. Investments in the cotton Price Assistance Fund are entirely in fixed interest stock. During the year 1968/69 (31st October) the return earned net of losses on redemption on an investment of nearly £276,000 was £12,231, or just under 4⅜%. This is not a very good performance. It may be wondered whether the CLSMB has the necessary expertise to maximise its investment returns and whether, in fact, it should possess such large investible funds. On the other hand the CLSMB has outstanding nearly £111,600 in the form of loans and accrued interest to growers and growers' co-operatives of which nearly £107,700 is written down as 'bad debts'. Alternatively, in the 1968/9 Annual Report mention was made of "..expenses on cotton loans, amounting to £ 18,768 . . . ." The role of statutory boards such as the CLSMB

as sources of credit for cotton growers may be questioned.

5.9. Cotton seed for planting. The CLSMB has adopted a variety of pricing policies on cotton seed for planting. Up to 1969 seed was issued free to growers. In that year about 65,000 hectares were planted and at a planting rate of 20 Kg per hectare, this implies that at least 1,300 metric tons of AR seed were issued. The opportunity cost of this seed (i.e. the sale price foregone) was about £25 per metric ton and therefore this policy cost the Board at least £32,500 excluding handling, transport and bagging costs. In fact the cost was much higher than this because cotton growers had no incentive to economise on the use of seed and there was considerable wastage. In 1970 the policy was modified so that in some areas growers were charged shs 5/- per 9 Kg bag of dressed seed (sufficient to plant 1 acre) but in other areas seed was still provided free but growers' returns were reduced there by 5 cents per Kg of seed cotton produced. Thus if the grower receiving free seed obtained a yield of less than 100 Kg of seed cotton per acre he benefitted under this policy. This was not efficient and was administratively troublesome. It was recommended that all growers should be charged the true cost of seed for planting although, of course, efforts should be made to keep this cost as low as possible, and it seems that the CLSMB was going to adopt this policy anyway. When ginneries were bagging seed for planting in 1 cwt bags (at the time when all seed was issued free), their allowance was shs. 35.50 per ton, including shs. 20/- for dressing the seed. In metric terms this is equivalent to about 32 cents per 9 Kg bag but of course the smaller and currently plastic bag will incur higher costs, probably not less than 50 cents per bag. The opportunity cost of the seed is about 50-55 cents per Kg so that the true cost per 9 Kg bag of seed ex-ginnery could be anything up to shs. 5.50. Therefore the current price to the grower of shs. 5/- per bag is too low because the retail margin of at least 10% should be added to the ex-gin price for co-operative societies and other retail outlets, plus a transport charge which could approach 1 cent per bag mile. Excluding this cost of transport the retail price should be at least shs. 6/- per bag. In fact it was recommended that the CLSMB should adopt a policy similar to that used by the Kenya Seed Company in distributing hybrid maize seed which is to have the same retail price throughout large contiguous areas rather than varying it by a transport differential. In this case the retail price for cotton seed for planting would be about shs. 7/- per 9 Kg bag, Shs. 2/- more than it is now. The writer considers though that if cotton growers are receiving a substantially higher price for their product, the subsidisation of cotton seed is no longer necessary nor desirable. The same applies to other inputs such as cotton spray providing that the grower has access to some form of seasonal credit.

6. Conclusion.

6.1. The underlying thesis of this paper is that the growers of cotton will have to receive a substantially higher price for the crop than they are currently receiving if the industry is to develop at a satisfactory rate. Gathering together the foregoing recommendations, a guess may be made on what could be the 'target' producer price for seed cotton given current levels of prices for lint and seed and expected costs. Reverting to equation (1.1) presented in the introductory section:

$$R_g = P_l{}^a + P_s{}^b - (C_{c,t} + C_g + C_{m,a})$$

All the price and cost variables being in terms of shs. per Kg of seed cotton, lint or seed as appropriate. The following tentative values for these variables are given for AR grade cotton:-

P_l = shs. 4.40 (after subtracting transport costs)
a = 0.32
P_s = shs. 0.48
b = 0.66
$C_{c,t}$ = shs. 0.04
C_g = shs. 0.25
$C_{m,a}$ = shs. 0.07 (based on 1968/9 costs)

Substituting these into the equation, we find

$$R_g(AR) = 4.40(0.32) + 0.48(0.66) - (0.04+0.25+0.07)$$
$$= 1.41 + 0.32 - 0.36$$
$$= 1.37$$

Therefore even after using these rather conservative values (receipts on the low side with costs on the high side), a target growers price for AR seed cotton of shs. 1.37 per Kg (about 62 cents per lb) is justified compared with shs. 1.10 per Kg now, a price increase of nearly 25%. Individual growers would receive a greater or lesser return than this depending on their location within the country and in relation to the ginnery, and ginneries may pay above the floor price. For BR seed cotton the following values are a guide line.

P_l = shs. 2.64
a = 0.29
P_s = shs. 0.25
b = 0.66

with the costs being as for AR seed (ignoring here the 0.05 cents/Kg difference in ginning costs).

$$R_{g(BR)} = 2.64(0.29) + 0.25(0.66) - 0.36)$$
$$= 0.57$$

Thus for BR seed cotton the 'target growers price would be 57 cents per Kg, say 26 cents per lb.

6.2. Alternatively, using equation 1.1 we can calculate what sort of product prices would be necessary to support the 'normal' or 'target' costs, margins and returns put forward:

C_c, collection costs: shs. 0.04/Kg seed cotton

C_g, ginners margins: shs. 0.25/Kg seed cotton

R_g, growers returns: shs. 1.32/Kg seed cotton

$C_{m,a}$, marketing and admin. costs: 0.07/Kg seed cotton

Thus

$$P_1 + P_s \frac{b}{a} = \frac{C_c + C_g + R_g + C_{m,a}}{a}$$

Substituting values,

$$P_1 + P_s \frac{0.66}{0.32} = \frac{0.04 + 0.25 + 1.32 + 0.07}{0.32}$$

$$= 5.25$$

If we set P_s at shs. 0.48 per Kg, then

P_1 = 5.35 - 0.99

= 4.26

Or the ex-gin price of lint (i.e. net of transport costs etc) would need to be shs. 4.26/Kg or shs. 1.93 per lb to be able to hold these margins or returns. During the past 10 years, this 'target' price was not maintained during the period 1965-1967 (See Table 1.1 page 6). On the other hand further economies may be made on the cost side even in the short run: possibly a cent on collection costs, certainly 5 cents on ginning plus, say, 2 on overhead marketing or administration costs. This is a total of 8 cents per Kg of seed cotton or 25 cents per Kg in terms of the 'fail safe' lint price. With these economies, this now becomes shs. 4.01 per Kg. Such a low average lint price has not yet been reached, at least not during the past decade.

Appendix.

Referring to para. 2.4 footnote 7, in practice it was recommended that ginners' returns for seed cotton should be on an 'into-ginnery' basis rather than on an 'at collection point' basis, the implication of paragraph 2.4. The into-ginnery price would be gazetted for each ginnery zone. This means that the collecting agents whether co-operatives or ginnery agents, would have to deduct their costs including transport from the seed cotton price paid to growers. This was seen to be an acceptable policy where collection is undertaken by co-operatives on behalf of growers but less so where collection is undertaken by agents employed by ginners, for example at Kitui and at the Coast. In these cases there is the danger that growers might be exploited and the writer recommended that the CLSMB should oversee growers' prices in these cases. Additionally, of course, co-operatives may choose to operate a transport pool system within a ginnery zone to gain political appeal and for administrative ease, thus negating the attempts to disentangle the intensive from the extensive margin of cotton production for which the policy of para 2.4 was formulated.