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Maize Policy in Kenya

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This paper was prepared initially as a memorandum for the Maize Commission of Inquiry. It is intended to serve the purpose of helping to provide an analytical framework within which the question of maize policy can be examined.

MAIZE POLICY IN KENYA

MEMORANDUM PREPARED FOR THE MAIZE
COMMISSION OF INQUIRY

A. THE MAIZE PROBLEM

Maize poses a unique problem in Kenya, a problem which can be understood only if viewed in proper perspective. The maize problem has several elements:

(a) Maize is used principally as the staple food of the vast majority of Kenyans. Because of the role of maize in the Kenyan diet, there is little attempt to substitute other foods for maize as the maize price rises, or to consume appreciably more maize as its price declines. To use the economists' term, the domestic demand for maize is highly price-inelastic. The increase in the quantity of maize demanded is roughly proportional to the increase in population.

(b) Due to the sensitivity of maize yields to rainfall and other climatic factors, and due to the variability of climatic conditions in Kenya from one year to another, maize yields are subject to large annual fluctuations. Consequently, the maize output obtainable from a given acreage varies unpredictably from year to year.

(c) Because maize is heavy and bulky relative to its value, transport costs are high. As a result, there is a big spread between the price that Kenya receives for exports and the price Kenya pays for imports. The cost of producing maize domestically can vary within a fairly broad range and still remain both above the export price and below the import price. The cost of producing maize is currently believed to lie in this range, so that it is believed uneconomic for Kenya to rely on world markets, either as an importer or as an exporter.

These three points, taken jointly, pose a dilemma. As it is uneconomic to import maize, it is natural for Kenya to strive for self-sufficiency. But, as it is also uneconomic to export maize, it is natural to plan to produce no more than is demanded domestically. Thus, the best strategy would appear to be for Kenya to produce enough, but only enough, to satisfy local demand. However, because it is not possible

to foresee the weather, it is impossible to get maize output equal to demand in each year. And because demand is inelastic, the quantity demanded does not adjust to changes in annual supply. If there were a free market in maize, the annual fluctuations in supply would lead to sharp fluctuations in price (as has been the case in Uganda). Because of the important role of maize in the economy, this is unacceptable.

The maize problem can be divided into three subsections: production and storage policy; pricing; and marketing. We will begin with a discussion of production and storage.

B. PRODUCTION AND STORAGE

1. Production:

Production policy involves selecting the level of annual domestic maize production to aim for. Production depends on the acreage planted, the techniques of production employed, and the weather. Associated with any selected level of production is an acreage that, given the techniques of production over the period considered, will on average produce the output required. The acreage that is needed for a given level of production will be changing in Kenya because of the radical changes in techniques of production that are taking place with the introduction of hybrid seed, and

It is important to note that, because of the variability of the weather, the target output will seldom be achieved in any one year. The best one can accomplish is to achieve target output on the average over a period of time, with some years falling short of the target and other years exceeding the target, and with the excesses roughly balancing the shortfalls. It makes little sense to view maize policy in the context of a single season. Whatever the production policy, shortfalls and excesses in individual years will be inevitable. One hesitates to raise a point as seemingly obvious as this; however, much of the discussion of this year's maize crop, as reported in the press, did in fact take a very short-term view of the problem.

2. Storage:

Once the acreage has been decided so as to provide for a selected output on average over the years (rising as population grows), provision must be made for disposing of surpluses in good years and providing for shortfalls in bad years. One way to do this is to export the surpluses and import the shortfalls. But, as noted, this is a costly procedure. The major alternative is storage.

The costs of storage consist of depreciation; interest on capital tied up in buildings, other equipment, and maize stocks themselves; additional transport and handling costs; fumigation; loss due to spoilage; and administrative costs. By comparing these costs with the costs associated with relying on foreign trade, one can arrive at an optimal storage policy, and an optimal amount of storage capacity for the Kenya maize economy. Without making a detailed comparison of these costs, it is not possible to say whether optimal capacity is greater or less than present capacity. However, present capacity has never been properly assessed according to these criteria, and it is likely that the optimal amount is very substantially higher than the present capacity of only 1.66 million bags. We feel that the gain to the Kenya economy of investigating and adopting an optimal storage policy would be very large. One of our principal recommendations is that such an investigation be conducted.

Of course, the size of storage capacity is only one aspect of storage policy. It is important also to adopt a consistent set of rules governing when to increase and decrease maize stocks. One wonders if even the existing capacity in Kenya has been fully utilised. We believe that the Maize Marketing Board must resist the temptation to earn a few pounds from the export of surplus maize, unless this is consistent with a positive storage policy.

3. Hybrid Seed:

The development and gradual introduction of hybrid seed is likely to have a profound effect on the maize picture in Kenya. This does not alter the need to view maize in the context of an analytical framework similar to that

suggested here. However, it does imply that the cost of maize production can be expected to drop over time as a larger number of farmers employ the hybrid seed and thus obtain substantially greater yields.

Kenya can respond to this change in technology in three ways: (a) cut back acreage; (b) increase output and plan to enter export markets; (c) explore possible avenues of utilizing a maize surplus internally.

(a) It will probably pay to cut back acreage in at least some marginal areas, so that a relatively large proportion of the maize crop is grown where production is relatively economic. Of course, before recommending that maize production be cut back in any particular area, it would be well to ensure that there are alternative crops that can be grown more economically than maize, or that there are alternative forms of employment for the people in these areas. It makes no sense to reduce maize production in any area if the only alternative is unemployment.

(b) Even with a reduction of output in marginal areas, output may expand as a greater number of acres is planted to hybrid. If the maize thus grown can economically be exported, then certainly Kenya should take steps that encourage production for export. It is difficult to predict now whether this will be the case. Much depends not only on what happens to domestic maize costs of production, but also on the trend of world market prices. If hybrid seed is introduced in a large number of countries throughout the world, as seems likely to be the case, then maize prices may fall to the point where it is uneconomic to produce for export, even with substantially higher yields than are obtained today.

(c) It may be possible to use surplus maize domestically. First, as noted above, the domestic demand for maize as a foodstuff can be expected to continue to increase for some time. Second, there may be opportunities for industrial processing as the price falls. Kenya can explore the economics

of producing such goods as starch, breakfast cereals, maize germ, and alcohol. Still a third possibility is to expand the use of maize as an animal feed as price falls.

C. PRICE POLICY

1. The Price of Maize:

The relative price of maize is the most important factor determining the volume of domestic production. For this reason, price policy is the principal instrument of production policy.

But the maize price also has other effects upon the economy. For example, because maize is the staple food of the vast majority of people in Kenya, the consumer price clearly has an important effect on the cost of living of these people and on their real incomes. Moreover, through its effect on the cost of living, the maize price may also influence wage rates and the cost of labor throughout the economy. Furthermore, by affecting the relative attractiveness of maize farming, as opposed to growing other crops and as opposed to other forms of employment, the maize price influences the pattern of agricultural production and, to some extent, the balance between urban and rural population. Finally, because changes in the maize price affect different population groups in different ways, the maize price helps determine the distribution of income. It is clear then that determination of the maize price has far-reaching implications for the Kenya economy.

If there were a single price that could be regarded as THE maize price and if this price were the sole determinant of maize supply, there would be little scope for achieving multiple objectives; the price would have to be set to bring forth the desired production, and that would be that. Fortunately, though, the Government has considerable flexibility in formulating maize price policy. Price is only a shorthand expression for what really amounts to a set of prices. For example, the price paid to producers differs from that paid by consumers, and the producer price in Nyanza Province differs from that in Coast Province.

2. Other Factors:

Other factors also help determine the supply of maize. The prices of alternative crops are of obvious importance. Also important are factors affecting the cost of production, such as the availability of hybrid seed, the effectiveness of agricultural extension workers, prices of fertilizer and other inputs; all of these can be influenced by Government policy. The marketing arrangements -- discussed in Section D -- are also important for they affect the thinness of the market and the degree of risk attaching to maize production. In formulating price policy, the Government must take into account all of the instruments at its disposal and determine how they can best be used to serve its objectives.

3. Large-scale and Small-scale Farms:

Approximately 5 percent of Kenya's domestic maize production is provided by the large-scale (mainly European) farms. On these farms, maize production is a strictly commercial venture. For this reason, and because of the presence of readily available alternative crops, the number of acres planted to maize is highly sensitive to the maize price. If the producer price is raised, other factors remaining constant, large-scale farmers tend to plant more acres to maize, thereby increasing maize output.

The remaining 95 percent of Kenya's maize crop is produced by small-scale (African) farmers. Most of these farmers produce maize primarily for home consumption, but approximately 5 - 10 percent of the maize crop grown on the small farms is offered for sale.

There are several reasons why the Government has focused on the large farms in establishing its maize policy. Because the large farms produce almost entirely for the market, and because they provide about half of the marketed output, price policy has been geared to conditions on these farms. This policy overlooks the large potential maize supply from the small-scale farms. And it fails to consider

the effect of the maize price on resource allocation, wage rates, and real incomes.

The relative ease with which information on the cost of production on large farms can be obtained, and the lack of knowledge about the operation of small farms have also been important in leading the Government to focus on the large farms. For example, there is little information on the relative economics of maize vs. alternative crops on African farms. Nor is there much information on how small-scale farmers respond to changes in price. This absence of information does not provide a rationale for concentrating attention on the large farms. Rather, it constitutes a need for further research on the small farms, which make up a substantial part of the agricultural economy.

Another argument for basing price policy on large-scale farming costs has been that the production on the European farms is asserted to be more stable and dependable than production on African farms. Both the Troup Report and the Sessional Paper on the Maize Industry make this point. The figures in Table 1, relating to marketed production, show that this point is not supported by the facts: A simple measure of year-to-year variation shows that the difference between the two groups is negligible. If anything, maize sales by the small-scale farms have been slightly less variable¹.

¹ The standard deviation about the mean is 222 for the large farms and 220 for the small farms.

Table 1

Marketed Production of Maize in Kenya, 1954 - 65
(thousands of bags)

| | large farms | Small farms |
|---------|-------------|-------------|
| 1954/55 | 1299 | 1001 |
| 1955/56 | 651 | 1081 |
| 1956/57 | 638 | 896 |
| 1957/58 | 793 | 989 |
| 1958/59 | 893 | 857 |
| 1959/60 | 822 | 788 |
| 1960/61 | 880 | 706 |
| 1961/62 | 850 | 768 |
| 1962/63 | 1118 | 1206 |
| 1963/64 | 583 | 502 |
| 1964/65 | 601 | 522 |

Sources: Government of Kenya, Statistical Abstract 1964; and figures supplied by Government of Kenya, Ministry of Economic Planning and Development, Economics and Statistics Division.

4. Price and Supply:

In formulating price policy, the place to begin is with a consideration of objectives. It follows from the discussion of Section A and B that provision of an adequate supply is a prime objective. To achieve this objective requires that the maize price be sufficiently high to encourage production.

Because the small-scale farmers produce maize principally for home consumption, it is often argued that they are not influenced by market prices. Admittedly, the production and sale of maize is less price-elastic on small than on large farms. However, there is evidence that small-scale farmers are guided by prices.

Both the producer and consumer prices affect the production and sale of maize on the African farms. Farmers who produce primarily or solely for sale are influenced by the producer price. As this price rises relatively to the prices of other crops, farmers tend to shift more acres into maize production. Farmers who produce primarily for their own consumption are influenced more by the consumer price. If maize is expensive to buy, subsistence farmers will tend to grow enough for their own needs; but if the price of maize is low, subsistence farmers may grow other crops to exchange for maize, thus reducing total maize production.

On the European farms, maize theft has been an important factor tending to reduce output. The acreage planted to maize decreases, the greater the prevalence of theft. And the incentives to steal are greater, the higher the price. For these two reasons, there may be a negative relationship between output and price on the large farms. Within some price range, acreage may decline as price is raised. It is worth keeping this in mind in formulating price policy.

The structure of prices among regions of the country and between large and small farms determines how the maize output is distributed among different groups.

The Government should take steps to see that any given output of maize is produced at the lowest cost. This means distributing the target production among regions and between large and small farms in a way which reflects differences in costs. Ideally, the marginal cost of maize production should be equated in all areas.

Because yields are higher on the large-scale farms, it is often argued that these farms should provide the large part of the marketed maize crop. However, higher yields do not imply lower economic cost. The relevant measure of cost is opportunity cost -- the value of output foregone by the resources used. This measures the real social cost to the country of producing a bag of maize in any particular area.

In the European areas, opportunity cost can be easily calculated. We know that there is a high rate of substitutability between maize and other crops -- notably wheat and barley. If the price paid the European producers is reduced, these farmers will shift into other crops which can be grown almost as profitably.

In the African areas, we have less information on opportunity costs. On many small-scale farms, maize yields are low. But costs of production are low as well. It may pay to encourage greater maize production on some African farms despite low yields. At the same time, it will surely pay to conduct further research on the economics of growing maize and other crops on these farms, and to consider measures that will improve the efficiency of small-scale farming.

If the Government wishes to encourage greater production in African areas without at the same time encouraging greater European maize output, there are several ways of doing so. If the maize price is raised, production will increase in both African and European areas, and the relative increase will likely be greater in the latter. However, if in addition to raising the maize price, the wheat and barley prices are raised as well, then a relatively greater increase in maize production will occur on the African farms.

The Government may wish to consider policies of this sort, that enable it to affect not only the overall level of maize production, but also its distribution among areas.

5. Specialization on African Farms:

In some areas of Kenya, maize is an uneconomic crop. In these areas, it does not pay to produce maize for sale, given the price obtaining in today's market. However, because of the large spread between the buying and selling price, it does pay in many cases to grow maize for one's own needs. Thus, farmers are encouraged to grow an uneconomic crop. It would be desirable in such cases to encourage farmers to shift from maize to other crops, providing a more efficient use of resources and encouraging integration into the market economy.

One way to do this is to reduce the cost of marketing, so that for a given producer price, the consumer price will be reduced. (We discuss marketing in Section D.) Another way to reduce the spread between the consumer and producer prices is for the Government to absorb part of the marketing costs. In the short run, this will entail subsidization of maize consumption. In the long run, however, as farmers develop a market orientation, the economy will be able to develop along sounder lines, rewarding the Government for its efforts. While we do not have enough information to recommend a subsidy, we consider the idea of sufficient importance to warrant further study.

6. Rural-Urban Balance and Wage Costs:

Maize price policy has an important influence on the population balance between rural and urban areas. Low rural incomes, resulting from low producer prices, tend to reinforce the drift to the towns to seek urban employment. Low consumer prices imply a low cost of living in urban areas, and similarly encourage migration to these areas.

If the Government wishes to retard the flow to the cities, high maize producer and consumer prices will help accomplish this.

However, a high consumer price for maize lowers the real incomes of people who buy maize, notably urban wage-earners. This in turn is likely to lead to upward pressure on wage rates, and hence on labor costs. A high maize price is thus likely to contribute to high costs of production in Kenyan industry. In formulating price policy, the Government should weigh the advantages arising from low labor costs against the costs associated with urban drift.

D. MARKETING

1. Government Control:

The need for some control over the marketing of maize is widely accepted in Kenya because of the special position of maize in the economy. The acceptance of the principle of control runs through most of the Government reports and sessional papers that deal with the maize industry. In 1962 the World Bank Report on Kenya endorsed this view, stating that "some form of organised marketing is essential". There is, however, disagreement over the form that control should take.

The system adopted by the Kenya Government aims at complete control over all stages of the marketing of the maize crop. There are strict rules that control prices to the producer and consumer, traders' commissions and margins, payment for transport, storage and purchasing procedures, and charges for milling. This comprehensive system of controls may serve a purpose, in regulating the supply and stabilizing the price. However, the chaos associated with this year's maize shortage, the rigidity of the present system, the opportunities it provides for graft and corruption, and the encouragement it gives to black market operations all suggest that relaxation of maize control may be in order. Moreover, it seems likely that the present system of control has contributed to the wide differential between

consumer and producer prices in several ways. First, any extensive system of controls has a large administrative cost associated with it; Governments are not typically efficient organizations. Second, there is some evidence that the present maize control system results in higher transport costs than would obtain in a freer market. Third, the cost of black market operations (including the cost of enforcement) arising from the present controls would be reduced with a less stringent form of control.

However, criticism of the present form of comprehensive controls does not imply rejection of the principle of control altogether. One can choose a middle ground, with the Government exerting a stabilizing influence on maize marketing, but at the same time providing scope for individual initiative in buying, transporting, milling, and selling.

What we suggest is that the Government provide a producer floor price and a consumer ceiling price, to be maintained by Government transactions in the market. Price fluctuations would be allowed between these limits, and commercial transactions would take place without involving the Government. When the producer price declines, the Government would stand ready to buy at the floor price. Similarly, when the maize price rises, the Government would stand ready to sell at the ceiling price.

Typically, in years of domestic maize surplus, the Government would be a net buyer, and in years of shortfall a net seller. As discussed in Section B, surpluses would be used to build up storage capacity which would be drawn upon in deficit years. The spread between the buying and selling price could be set so as to permit the Government to cover the cost of storage, transport, plus any administrative costs. The scheme would help remove the present incentive for black market operations. It would also help reduce the costs of maize distribution, and hence the spread between consumer and producer prices. We think therefore that it deserves careful consideration by Government.¹

¹ The scheme was suggested by the World Bank mission to Kenya in 1962, but was rejected without adequate consideration.