The Development of a Local Machinery Industry in Kenya

Ron Mathews

(Reprint Series)

Economic Development Institute of the World Bank
THE DEVELOPMENT OF A LOCAL MACHINERY INDUSTRY IN KENYA

Ron Mathews

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The Development of a Local Machinery Industry in Kenya

by RON MATTHEWS*

There is a little-known machinery-producing sector in Kenya that not only continues to survive but even to prosper, at least in pockets, albeit not impervious to the enumerable constraints which dog the local market. The success stories are few, however. It would indeed be surprising if this were otherwise, considering the nature of the overall economy, since industrialisation is constrained not only by the obvious limits of domestic demand, but also by the official preference given to the development of traditional exports, which has meant that the intensity of the industrialisation drive has been weakened by progressive reliance on the foreign-exchange earnings of cash crops. This increasing dependence is ironic in view of the fact that the stimulus for this kind of industrialisation is often precisely to diversify the economy away from the reliance on traditional primary exports.

Although the local market may be weak, the fact remains that the industries of Kenya are often lauded as being some of the most sturdy in Africa. Even through the difficult period subsequent to the closing of the border with Tanzania, 1977-82, the manufacturing sector sustained a healthy 6.6 per cent rate of output growth, increasing its share of the gross domestic product from 12.1 to 13.3 per cent. This performance is clearly remarkable when we remember that almost every state south of the Sahara suffers, to a greater or lesser extent, from industrial stagnation, declining commodity-export revenues, substantial foreign-debt repayments, high rates of population growth, food...

* Economics and Financial Management Group, Cranfield Institute of Technology, Bedfordshire. This study was undertaken while the author was a Research Associate at the Institute for Development Studies, University of Nairobi, thanks to financial assistance provided by the World Bank under an award from the Robert S. McNamara Research Fellowship Programme. It is based on a sample survey of 37 'mechanical' machinery manufacturers: 11 'large' firms, each of whom employ more than 50 workers, and 26 'medium sized', with 20-49 employees. The response rate was 76 per cent.

1 The country's dependency on the foreign-exchange earnings capacity of cash crops is highlighted by the fact that the long-term trend shows an increased reliance on coffee and tea. These two commodities made up 27 per cent of total exports in 1964, and 45 per cent in 1983; Ministry of Finance and Planning, Economic Survey: Nairobi, 1984.

shortages linked with malnutrition and starvation, and, in some cases, imminent national bankruptcy. The examination of Kenya’s machine-building sector is conducted against such a back-drop, and our critical appraisal, as a consequence, needs to be tempered by the minimal comparative performance of many of the African economies.

Albeit that Kenya, in its efforts to industrialise, cannot be expected to emulate the strategies of the Soviet Union, Indian, China, and more recently Korea and Taiwan, it has nevertheless paid scant attention to one of the primary goals common to the development strategy of these states — namely, technological self-sufficiency. In this respect little has changed since independence. Manufacturing activity has continued to evolve along a western technological frontier that has been demarcated by the transnationals, which dominate the broad spectrum of operations in this sector, importing the majority of their process equipment. Unlike a number of newly-industrialising countries (N.I.C.s) elsewhere in the Third World, Kenya has failed to promote technology-producing enterprises as even partial catalysts in the pursuit of local industrial innovation.

There is one exception to this rather disappointing picture: the production of ‘mechanical’ machinery, because here an industrial structure has been created which is conducive to the generation of indigenous expertise. My aim, then, is to describe and examine the economic status of this small but strategically important industry, providing perhaps the first insight of its contribution in the technological development of Kenya.

1 India’s degree of self-sufficiency in the machine-tool industry advanced from a position in 1955 where it could supply only 11 per cent of total consumption to one where 20 years later, in 1975, it accounted for 78 per cent of the country’s demand. Ron Matthews, ‘Industrial Strategy and Technological Dynamism in Machine Tool Manufacture — Comparative Perspectives on India and Japan’, University of Lund, Sweden, Research Policy Institute, 1982, Technology and Culture Series No. 7. For a discussion of self-sufficiency in this field as a major developmental goal, see Chu-Yuan Cheng, The Machine Building Industry in Communist China, Edinburgh, 1972, p. 212.

2 Fred Nixon, ‘Import-Substituting Industrialisation’, in Martin Fransman ed., Industry and Accumulation in Africa, London, 1982, p. 49, draws the following conclusions, which seem particularly apposite for Kenya: import-substitution ‘has not, in practice, significantly alleviated the balance-of-payments constraint; it has led to a growing dependence on a largely imported, capital-intensive technology and has thus not created extensive employment opportunities or indigenous technological development; the process has been heavily dependent on foreign capital and has emphasised the establishment of consumer goods industries at the expense of investment and capital goods industries; it has led to what many would regard as an undesirable redistribution of income and in general it has failed to generate a sustained process of economic growth.’
Kenya has been manufacturing machinery for longer than is generally realised. A notable proportion of producers pre-date independence in 1963, and the roots of a sizeable and tenacious minority can even be traced back to the late 1940s. It was the Asian entrepreneurs who comprised this hardy core, several having served their engineering apprenticeships in the railway workshops in Nairobi before identifying opportunities to set themselves up in business. The Asian flair for mechanical undertakings induced others to establish basic workshops for vehicle repairs to serve the rapidly growing post-war market for imported transport equipment.

In the rural towns, such as Kisumu and Eldoret, this form of specialisation soon began to encompass other more agriculturally related mechanical activities, including the repair and maintenance of tractors and farm equipment. The next step was the fabrication of agricultural machinery for the specific needs and requirements of the farming region in which the manufacturer was situated. Thus, there are now firms in Kisumu that specialise in building sugar-cane crushing machinery, whilst in the Rift Valley plough and harrows are produced in response to the needs of the large-scale diversified arable-farming community. Nairobi is the main location for the manufacturers of tea and coffee machinery.

After independence, a number of the larger machinery organisations, especially those from Britain, decided to establish manufacturing facilities in Kenya. The loss of a hitherto captive market for external companies obviously helped to galvanise their interest in creating local productive capacity, initially in Kenya as a first step in the penetration

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1 This seems to be supported by Paul Bennett's observations when he noted in 1981 that 'The skilled artisans [of the engineering sector] were predominantly Asians who were either poached from the railways or other government departments, or directly imported from overseas. Engineering skills were mainly manual requiring little theoretical knowledge and were acquired as a result of prolonged in-plant experience.' ‘The Formation of Engineering Labour Markets in Kenya, 1918-79’, I.D.S. Working Paper No 379, Nairobi, February 1981, p. 20.

2 Note Per Kongstad's comments on the importance of the Asian influence on the industry: ‘In metalworking industries the Asians operate most of the 200 small or medium-sized factories near to Nairobi, Mombasa, Nakuru and Kisumu. It may be argued that general engineering is a key service industry on which the maintenance and increase of productivity in agriculture and other industries ultimately depends. While the exact location of agricultural processing industries is less important to peasants and farmers in a country like Kenya where transportation is cheap and abundant, the service industries providing repair facilities and general mechanical competence certainly must be within reach of the productive sectors to which they are linked, or should be linked.” 'Kenya: industrial growth or industrial development?', in J. F. Rweyemamu (ed.), Industrialisation and Income Distribution in Africa, Codesria, Dakar, 1980, pp. 99 100.
of the region, and thence to the largely untapped agricultural equipment market in the rest of the continent. The progress made by the multinational companies towards this objective, however, has been spasmodic. The collapse of the East African Community, the persistent severe droughts, and the lack of political stability and economic development in numerous African countries has all helped to dampen activities. But despite the lack of major growth opportunities thus far open to these larger companies, few have ‘pulled up sticks’ and departed. It can only be surmised that the old dog-in-the-manger, oligopolistic tendencies of cornering whatever markets are available, continue to dictate an essentially defensive commercial strategy.

Although the large firms dominate the production of machinery, at least in terms of value, several smaller enterprises have contributed to the rich diversity of output that has evolved in recent years. There is, in point of fact, a high degree of specialisation within the industry. Although the following list of productive activities is not exhaustive, it offers a clear indication of the considerable range of available skills and technical expertise: namely machinery and equipment for (i) concrete block-making, (ii) saw milling, (iii) wood working, (iv) press-stamping soap, (v) ventilation and air conditioning, (vi) folding, packing, and hoisting, (vii) compressing air and gases, (viii) manufacturing textiles, (ix) crushing sugar-cane, (x) cotton ginning, (xi) maize milling, (xii) harvesting and processing coffee, tea, and sisal, (xiii) spraying crops, (xiv) storing grains and seeds, and especially (xv) general farming, including making a broad range of ploughs, hoes, and harrows. Apart from this impressive array of specialised competence, the majority of manufacturers offer associated fabrication and welding operations, typically related to customised production, against orders for a host of subsidiary items such as boilers, storage tanks, and agricultural trailers.

In line with the experience of more industrialised countries elsewhere, the manufacture of machinery in Kenya emerged as a response to the existence of viable commercial opportunities. In most cases the production of equipment was commenced to satisfy a demand that existed prior to its local supply, and the initial process was inevitably unco-ordinated, fragmentary, and of modest beginnings. However, it

1 The eighteenth-century industrial revolution in Britain would most emphatically have been still-born without the emergence of early machine-tool technology. It is well-known that James Watt built the first workable machine, the steam engine. But its successful arrival was delayed for years, as he was unable to obtain sufficient compression from the fit between piston and cylinder until John Wilkinson solved the problem by inventing the first effective machine tool: a horizontal boring mill. See C. R. Hine, *Machine Tools and Processes for Engineers* (New York, 1971, p. 2.)
Table 1
Growth Characteristics of the Machinery-Producing Sector,
1964–82

<table>
<thead>
<tr>
<th>Year</th>
<th>No.</th>
<th>Employment</th>
<th>Labour Costs</th>
<th>Value-Added</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. index</td>
<td>K£'000</td>
<td>Index</td>
</tr>
<tr>
<td>1964</td>
<td>316</td>
<td>161</td>
<td>102</td>
<td>159</td>
</tr>
<tr>
<td>1976</td>
<td>386</td>
<td>199</td>
<td>100</td>
<td>413</td>
</tr>
<tr>
<td>1977</td>
<td>518</td>
<td>137</td>
<td>114</td>
<td>439</td>
</tr>
<tr>
<td>1978</td>
<td>591</td>
<td>486</td>
<td>139</td>
<td>571</td>
</tr>
<tr>
<td>1979</td>
<td>586</td>
<td>549</td>
<td>148</td>
<td>1,000</td>
</tr>
<tr>
<td>1980</td>
<td>825</td>
<td>779</td>
<td>188</td>
<td>1,466</td>
</tr>
<tr>
<td>1981</td>
<td>736</td>
<td>871</td>
<td>190</td>
<td>1,562</td>
</tr>
<tr>
<td>1982</td>
<td>539</td>
<td>697</td>
<td>140</td>
<td>1,238</td>
</tr>
</tbody>
</table>

* The index has been constructed as per a deflator for manufacturing calculated by Jan Vandemoortele, 'Kenya Data Compendium', I.D.S. Occasional Paper No. 44, Nairobi, 1984.
* Kenyan pound shown in current values.

is generally acknowledged that during the early phase in the development of machinery production in many countries, the meagre proportion of national resources employed as inputs to the industry, and the equally small value of its output to total industrial production, belies the sector's strategic quality in the pursuit of non-dependent technological progress. The initial epoch of machinery production in Kenya is an example of this general pattern.

The growth characteristics of the machinery-producing sector in Kenya are quantified in Table 1. Net output, in real terms, has grown at a fast pace since independence of 7 per cent per annum, even given the lean commercial environment in which the sector operates. It can

2 The argument is that mechanical engineering helps to catapult a country forward in its drive for economic and technological maturity. The smallness of the initial size of the machine-building sector relative to the host economy clouds its strategic importance — it grew, for example, in China from a 2.7 to a 12 per cent share between 1949 and 1966, and in India from 4.5 to 23 per cent from 1946 to 1974; Cheng, op. cit. p. 1, and Matthews, op. cit. p. 6.
3 Machine-tool production is usually seen as a principal component of the 'mechanical' machinery sector. Yet, even as late as 1966, it accounted for only 0.3 per cent of total manufacturing output in India; Matthews, op. cit. p. 57.
4 Thus, even though the Kenyan authorities have not given overt emphasis to the promotion of a capital-goods industry, its 7.4 per cent rate of growth has matched the manufacturing sector over the same period of time. In fact, more recently, from 1976 to 1982, the 10.2 per cent growth of the machinery sector has been faster than that of manufacturing at 8.1 per cent.
be readily seen, moreover, that whilst physical labour and its associated
employment costs experienced conservative rates of growth between
1964 and 1980, the expansion of value-added has been more in line with
the industry's potential role as a leading sector in the growth of the
industrial economy.\(^1\) Things started to go awry, however, after 1980.
The progressive decline in employment and value-added since then
reflects a serious deterioration in the market prospects for equipment.

THE DEMAND FOR MACHINERY

The biggest single constraint to the continued growth and develop-
ment of the industry is undoubtedly low demand. In stating this it must
again be emphasised that an important asymmetry exists between the
minimum market-size requirements of the machine builders and those
of the consumer-goods industries; for specialisation to be effective in the
former, a large market is essential, possibly greater in size than that
required to achieve all the economies of scale in the latter.\(^2\) The crux
of this distinction between the demand curves facing capital- and
consumer-goods rests in the unique characteristic of outputs for pro-
ducers: namely, the effect of 'stocking-up' the market, so that the
amount of machinery sold now will influence what can be sold later.
This feature has been, and continues to be, the cornerstone to
machine-building enterprises in the western world.

A useful paradigm can be formulated as soon as we realise that the
demand for the products of the machine-building industry is limited
by the specialised nature of the product range of the constituent firms.
Once the saturation of the market had taken place, attempts to increase
or maintain demand can only be achieved by finding new customers.
This would occur by the creation of newly designed, invariably
increased capital-intensive products that offer an improved, and hence
a more efficient, mode of operation, so vital in a highly competitive
industrial milieu. It is small wonder that machine-builders not only
deliberately seek to render obsolete the equipment held by customers,
but also actively to hasten this process. To increase demand, then,
capital-using innovations must occur.

\(^1\) Under the wider definition of machine building, this industry grew at the rate of 18.6 per
cent in Communist China between 1952-66; at 26 per cent in the Soviet Union, 1927/8-1937;
at 15.6 per cent in India, 1951-67; and at 15.1 per cent in Japan, 1952-66. See Cheng, op. cit.
p. 228. According to the classification of capital goods - which defines them as encompassing
electrical, non-electrical, and transport machinery - Kenya sustained a rate of output growth
between 1964-80 of 13 per cent.

\(^2\) Of course, the relevance of this comparison applies only to the consumer-goods industries
involved in the production of non-durable goods.
If such reasoning proximates to reality — and there exists empirical evidence to suggest that it does¹ — then the paucity of options available for the poorer countries to increase demand in the production of unchanged capital goods will be severely limited in the long-term. Reliance on foreign-designed technology, moreover, will do little to ease the problem because the capital-using nature of the innovations taking place in the equipment-supplying industries of the West is generally inappropriate to the conditions operating in such countries as Kenya. In a capital-scarce economy, innovations are much more likely to be calibrated towards reducing the degree of complexity involved in the final product, rather than upgrading models in an attempt to induce manufacturers to replace fully depreciated but still productive capital equipment.

Inadequacies in demand during the formative years of a capital-goods industry stultify progress towards industrial maturity. Important in this sense will be the synergistic relationship between increasing levels of demand and the degree of efficiency-inducing division of labour that has been achieved. The capacity to produce and utilise indigenous equipment is a vital element here because of the implausibility that vertical disintegration in third-world machine-building industries will take place merely through the transplantation of foreign technology. More likely an 'evolutionary' process is required, whereby existing patterns of production are gradually transformed to incorporate those firms which emerge to specialise in the various vertical sequences of production that are common to metal-using industries.

Some of the most important of the operations conventionally undertaken by these supplier industries relate to the provision of components, steels, castings, and forgings. Kenya, however, has made only modest progress in these areas. As a consequence, a mixture of imports and vertical integration still characterises the input-sourcing structure of machinery manufacture. The achievement of cross-integrated horizontal specialisation thus continues to remain a distant ideal.

**Sources of Inputs**

What elements are required to encourage the expansion of machinery-producing industries?

¹ For a complete exposition of this theory, and a review of the evidence on which it is founded, see William Brown, 'Innovation in the Machine Tool Industry', in Quarterly Journal of Economics Cambridge, Mass., August 1957.
1. Components

The productive structure of Kenya's capital-goods sector has not yet advanced to accommodate the refined levels of interdependence exhibited by the industries of developed countries. The absence of a fully diversified sub-structure of component manufacturers, for instance, means that the majority of the complex items which are classified under this heading are either assembled from kits, with the resultant loss of most of the value-added, or imported in their entirety.

Typical in this context is the case of electric motors, which a Kenyan subsidiary of an engineering company in India has been assembling up to 20 h.p. since 1980. However, this external firm does not wish to become involved in local production unless tariff protection is awarded by the Government. At present, the same 25 per cent rate of duty is paid on the import of the complete motor, as well as for the component parts,1 so there is no incentive from the point of view of the Indian manufacturer for production to take place in Kenya.2

2. Steel

The supply of steel as a substantial input in the fabrication of machinery also continues to originate from abroad. As such, the situation represents a further hiatus in the network of backward linkages which traditionally derive from capital-goods production. There are, in fact, a number of steel-rolling mills in operation in Kenya, though they apparently suffer from considerable under-utilisation of capacity due to the shortage of scrap metal available for melting purposes.3

1 The Finance Bill, 1984, Nairobi, Schedule 2.
2 There are two points here. First, the Government has to ensure that prior to granting tariff duty relief there will be an actual, or at least potential, increase in local production. There seems little justification for tariff concessions if, in the example cited, electric motors were to be imported in C.I.F. form, simply to be assembled in Kenya. Second, the prejudices of the manufacturers regarding the height of the tariff wall may indicate a level of 'nominal' protection that is more than that actually warranted as regards 'effective' protection, defined as measured domestic value-added minus world value-added, expressed as a percentage. From an economic perspective the effective rate is a more useful measure because it gauges the protection given to the domestic factors of production and, therefore, the attractiveness of the activity. See the World Bank, Kenya: into the second decade, Baltimore, 1975, pp. 318-21, for an extended discussion on the distinction between nominal and effective rates of protection.
3 Ship-breaking has been introduced as a means of alleviating the shortage of local scrap, but as yet the industry is still in its infancy. The higher quality speciality steels all require to be imported and, when available, are usually extremely expensive. It has been reported that in some instances the local importers/wholesalers add 100-400 per cent to the c.i.f. Mombasa port prices. Peter Coughlin, 'Converting Crisis to Boom for Kenyan Foundries and Metal Engineering Industries: technical possibilities versus political and bureaucratic obstacles', in I.D.S. Working Paper No. 198, Nairobi, 1983, p. 6.
At the beginning of the 1980s, a project for the construction of a mini-integrated steel mill was proposed with the objective of establishing viable steel production in Kenya. These plans are seemingly no longer 'live', however, as the construction of the factory depended on a set of circumstances which no longer prevail. Most importantly, in this context, the international recession led to a buyers' market for steel and related products. Steel producers the world over are racked by severe excess capacity and are readily prepared to offer heavy discounts to potential purchasers in order to obtain some contribution to their fixed costs. But the international recession also hit Kenya's ability to earn foreign exchange through the export of its cash crops. This meant in turn that the funds necessary for the construction of a modern steel mill were not available.

A final difficulty had to do with the scarcity of local factor resources. The mill had been planned to employ a charcoal-energy process, and this would have required the creation of a man-made eucalyptus forest on as many as 256,000 hectares of coastal land. Even if this could have been purchased at a suitable price, there was still the formidable obstacle to be faced that a decade would have had to have passed before the complete cycle of trees to charcoal could have taken place and steel production commenced. To any government, especially in a capital-scarce economy, this is an inordinately long time to have substantial amounts of capital sunk into a commercial venture before any return could be expected.

3. Castings and Forgings

Foundries and forging shops inevitably play an essential rôle in the process of manufacturing machinery. Here again, however, there are problems. At present there are eight foundries in Kenya – the largest of which is located in the railway workshops in Nairobi – but although they together employ around 500 workers and possess a capacity to produce 7,000 tons of castings annually, they are mainly either departments of public-sector concerns undertaking job work for outside firms, or dedicated foundries making spares for sugar and textile mills. There is still not a single modern mechanised foundry in the private sector for producing heavy as well as thin and precision castings. This lack of specialist foundries has caused over half the machinery producers to integrate basic casting and forging operations into their manu-

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facturing processes. Indeed, primitive casting and forging facilities are to be found in the smallest workshops, especially those located in the rural areas that are not near to Nairobi.

Aside from the distance of specialist foundries and forging shops from the customer industries, there are other reasons that justify the local casting and forging activities. Non-dependence on suppliers, cheapness, and the ability to monitor quality are all considerations that can be cited in this respect. The castings produced from the rudimentary facilities of the machinery firms are far from being precision, quality pieces of work; the majority of them are rough, pitted, with blow-holes, and invariably out of alignment. This is not unexpected, however, if the sand used in the moulds is not the correct type, often so clogged and lumpy as to seriously impair the possibility of producing a high-quality finish. One manufacturer of coffee machinery, having tried unsuccessfully to obtain the required precision and 'trueness' in Kenya, was thereafter forced to obtain the castings for his bean-crushing discs from a foundry in Britain.

CAPACITY UNDERUTILISATION

Insufficiency of demand is the main constraint in evolving a sub-sector of specialist ancillary producers serving the needs of the capital-goods industries. It also represents the primary limiting factor in the transformation of a rudimentary capital-goods sector to a specialised and integrated entity. The problem is that in those countries still at the frontiers of industrialisation, and processing only a low level of

1 Survey of machinery manufacturers, 1985.
2 Non-dependence on principally foreign suppliers was the rationale behind Taiwan's reliance on vertical integration during the early development of machine-tool manufacture. This has been both the cause and effect of the 'hearth of many types of support industries, such as foundries, forges, heat treatment, electro-plating, and tools and dies. Early on when production was getting under way, machine-tool builders were faced with the choice of either importing their inputs or making them where possible. The small size of the market, however, as well as a critical shortage of foreign exchange, make a reliance on dispensable imports unthinkable.' Alice Amsden, 'The Division of Labour is Limited by the Type of Market: the case of the Taiwanese machine tool industry', in World Development, Oxford, 5, 3, 1977, p. 222.
3 The development of the machine industry in Korea was hampered by similar foundry/forging deficiencies, including inadequate treatment, cleaning, and processing of sand for moulds, as well as poor plant layout and wastage of materials, which imposed costs at a later stage of machine-finishing. Cited by Jayati D. Mitra, 'The Capital Goods Sector in LDCs: a case for state intervention', World Bank Staff Working Paper No. 343, Washington, D.C., July 1979, p. 16.
4 The major conclusion to Jack Baranson study of the Cummins diesel plant in India was that 'contrary to widely held beliefs among development economists about capital deficiencies, the evidence seems to indicate that the basic difficulties lie in limitations imposed by the scale of local markets and overall deficiencies in supplier capabilities.' Manufacturing Problems in India: the Cummins diesel experience, Syracuse, 1987, p. 31.
capital accumulation, the minimum size of the machine-building output necessary to capture economies of scale—thus leading to progressive specialisation in mechanical activities—is likely to be far from being reached.

The old dictum of Adam Smith that 'division of labour is limited by the extent of the market' has been dolefully relevant to Kenyan and other similarly placed third-world machinery producers. Smith was reasoning, of course, on the basis of two interrelated, though none the less distinct, economic concepts, and for the purposes of clarifying these it is useful to mention the contribution made by Allyn Young nearly 50 years ago. He helped to place the 'division of labour' concept into a technological context by arguing that it is associated with the use of specialised machinery. Thus, 'with the division of labour a group of complex processes is transformed into a succession of simple processes, some of which at least lend themselves to the use of machinery'. As regards the second concept, Young asked, 'what constitutes a large market? Not an area or population alone but buying power, the capacity to absorb a large annual output of goods'. Clearly, the author's interpretation of the 'extent of the market' was not in terms of physical or geographical size, but rather the degree of effective demand. Thus even low-income India, with an extremely large land mass, population, and industrial market, possesses a machine-building sector with quite profound and well-documented inefficiencies resulting from under-utilisation of capacity. For the much smaller and poorer African economies, the problems connected with excess capacity will obviously be that much more attenuated.

At present the levels of capacity utilisation amongst Kenya's machinery manufacturers arecripplingly low: only 17 per cent of the firms are operating above 80 per cent of capacity; well over half are working at below 60 per cent, and a sizeable minority, 25 per cent, operate at less than 40 per cent of capacity. The reasons for this are diverse, including both the Government's long-standing trade policies,


\[3\] The foreign-parent company produces approximately 2,500 units per annum, compared to 600 in the heavyduty of the Kenyan subsidiary, now down to one unit a month. This low level of capacity utilisation is widespread across the engineering sector. A separate study in 1983 found that foundries in Kenya used only 23 per cent of their capacity and metal engineering workshops only 34 per cent. see Coughlin, op. cit., p. 2.
which had a pernicious effect on the efficiency of domestic production. and, ironically, also the more recent trade liberalisation strategy which has allowed an influx of cheaper but good quality imports onto the market. The collapse of the East African Community, as well as the closing of the border with Tanzania, did nothing to reduce the tardiness of export opportunity. Lack of suitably skilled labour is yet another problem, as is the relatively high costs associated with its employment.

There were also the manifold reverberations which ensued from the 1982 tremors to governmental stability. It has been suggested that the attempted coup d'état had a deleterious effect on the buoyancy of the market, as perceived by the foreign companies operating in Kenya, precipitating a decline in capital investment. The psychological shock to market confidence caused by the concurrent disturbances is also reported to have devalued the value of property — the major, perhaps only, asset that can be used as collateral by small to medium-sized companies in bank loan applications — thereby making it even more difficult to raise fixed or working capital. Furthermore, the associated deterioration in the property construction business had a damaging chain reaction on the demand for cement blocks, as well as the equipment for making them. This is, in fact, a good example of how particular segments of the machinery-producing industry can be sensitive to generalised market factors.

The fall in world commodity prices provides another illustration. Kenya's sugar growers have been seriously affected by the worsening cash inflow from their exports, and this has naturally served to diminish the sales prospects of those producing the necessary crushing machinery, often relegating them to repair and maintenance engineers. Moreover, the sub-Saharan drought, which has brought enormous human suffering in its wake, has also had implications for the less headline-catching affairs of the agro-related manufacturers, since the loss of farm income affects the replacement of farm equipment: sales generally begin to decline after not more than a one to two-year time lag. Hence the manufacturers of ploughs, harrows, and hoes in Nairobi have already been badly hit by the effects of the drought, with many companies operating at levels of excess capacity approaching 60 per cent.

These demand constraints clearly militate against the expansion of the machinery sector. The 'serial production' of equipment does not take place anywhere in the country: the larger firms manufacture

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1 According to the Organisation for Economic Co-operation and Development, Economic Outlook, Paris, 1984, non-oil commodity prices are in real terms, after allowing for inflation, now 70 per cent below their 1974 peak, 38 per cent below their average during the 1960s, and at about the same level as their 1951 low.
'batches' from time to time, whilst the rest wait for specific orders. Indeed, although the fabrication of machinery was the raison d'être for the establishment of these smaller enterprises, their efforts are now directed very much more to the repair and service of equipment previously supplied. The coffee-machinery producers, for instance, are kept working by the annual renovation of their previously installed equipment, and are in particular demand to repair or replace the rotary pulpers that have been damaged by the constant wear and tear of crushing coffee beans. Other companies faced with idle manufacturing capacity have sought to diversify their activities - for example, one fabricator of general farm machinery has shifted to making stands for Singer-sewing machines, as well as re-conditioning liquid petroleum-gas cylinders on a contract basis for locally-based foreign companies.1

TECHNOLOGICAL SELF-SUFFICIENCY

No country is - or indeed ought to be - totally self-sufficient in its technological needs. The very character of contemporary international intra-industrial trade connotes a degree of specialisation that is far more conducive to the achievement of efficiency gains than any attempt by individual countries to produce all machine models and types themselves. The question is, however, what determines the balance between local supply and demand?2 In the final reckoning this will probably hinge on government policy, either directly through public investment programmes, or indirectly via tariff and tax concessions to the private sector.

The conventional conduit for developing countries to secure reductions in technological dependency is through the policy of import substitution. Francis Stewart argues that the outcome in Kenya has been more in tune with import replication than simply substitution.3 In other words, the goods previously imported have not merely been

1 As a means of alleviating the difficulties associated with slackness in demand, various machine-tool manufacturers in India have also diversified their output. One producer of lathes concurrently managed to produce in the same workshop a number of components for the local motor-scooter factories. Ron Matthews, 'The Techno-Economic Development of the Indian Machine Tool Industry with Special Emphasis on Aspects Affecting Efficiency', Ph.D dissertation, University of Glasgow, 1981.

2 In this context, Ian Little, Tibor Scitovsky, and Maurice Scott, Industry and Trade in Some Developing Countries - a Comparative Study (Oxford, 1970), p. 11, argue that 'A determination to pursue import-substitution too far results in a neglect of comparative advantage. There are many examples of enterprises set up by governments, and of industries being encouraged by heavy protection, with little or no thought given to the costs, or to alternatives.'

replaced by locally produced items, fulfilling more or less the same function, but rather have been 'cloned' so that they are the exact replicas of what was previously imported.

This process implies that the technology required to produce these replicated foreign goods will need to be identical to that employed abroad, and such a strategy has all manner of unsavoury implications for the Kenyan market. Some of the more commonly-cited defects include (i) the serious effects on the balance of trade which suffers because heavy imports of machinery ensue; (ii) import-biased technological change occurs, and its inappropriateness to domestic conditions is alleged to be reflected in the low levels of labour productivity and capacity utilisation, leading to high unit costs of production; iii the unequal distribution of income is perpetuated to support the imposed alien tastes designed for rich countries; and iv the formal-sector wage structure becomes distorted, due to the need to pay for the scarce skilled labour able to operate the capital-intensive technology.

The Kenyan economy is mainly exposed to these ills due to the foreign domination of its manufacturing sector. This is attested by Colin Leys, who estimated that the share of African private capital in manufacturing and repairing in 1976 was of the order of only 5 per cent.2 The extensive involvement of transnationals in Kenya is a major reason why industry exhibits such a high dependency on foreign technology. Table 2 shows quite clearly the high degree of market

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1 Source: National Abstract, 1983
2 Colin Leys, Accumulation, Class Formation and Dependency, Kenya in Transman ed., op. cit., p. 170
TABLE 3
Share of Non-Electrical Machinery in Total Capital Investment, 1977–81

<table>
<thead>
<tr>
<th>Year</th>
<th>Private</th>
<th>Public</th>
<th>Total</th>
<th>Gross Output of Machinery Sector</th>
<th>Share of Machinery Sector in Total Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>98,440</td>
<td>29,900</td>
<td>128,340</td>
<td>1.002</td>
<td>1.8</td>
</tr>
<tr>
<td>1978</td>
<td>127,570</td>
<td>28,540</td>
<td>156,110</td>
<td>1.906</td>
<td>1.2</td>
</tr>
<tr>
<td>1979</td>
<td>84,330</td>
<td>34,400</td>
<td>118,730</td>
<td>1.450</td>
<td>1.2</td>
</tr>
<tr>
<td>1980</td>
<td>97,120</td>
<td>30,750</td>
<td>127,870</td>
<td>2.058</td>
<td>1.6</td>
</tr>
<tr>
<td>1981</td>
<td>96,600</td>
<td>36,820</td>
<td>133,420</td>
<td>2.927</td>
<td>2.2</td>
</tr>
</tbody>
</table>

* The output of machinery is after deduction of exports.

penetration of technology imports during the period 1976–82, when both domestic capital formation and imports stagnated, with little in the way of a trend towards technological self-sufficiency being discernible. Thus, it would seem that the expansion of local capital-goods production in Kenya is simply not taking place. However, if the analysis is made more specific - as in Table 3, where the output of just ‘mechanical’ machinery is pitted against total capital formation for the entire sector - then a more positive pattern can be observed. Even though the contribution of this local sub-sector is not sizeable in absolute terms, its growth is positive and the trend moreover is upward. The figures are interesting, because they provoke speculation as to why the machinery industry is increasing its share of a fairly static total demand for equipment. The explanation almost certainly rests on the fact that there is virtually a captive market for agriculturally-oriented machinery. Recalling the structure of the industry's output,

1 Source: Statistical Abstract, 1983

2 The problem with this judgement, and the analysis from which it derives, is that nowhere in the government publications are the data defined for total demand and imports of machinery and equipment. But due to orders of magnitude it is, nevertheless, reasonable to assume that the figures have regard to the broader definition of capital goods, incorporating transport and electrical machinery.

3 Kenya’s direct imports of agricultural equipment in 1983, covering ploughs and parts thereof, cultivators, weeder, hoes, harrows, soil preparation equipment, and tea-processing machinery, amounted to just slightly over Kc 300,000. This needs to be compared with the direct imports of metal-working machine tools alone, which in the same year came to more than Kc 3,750,000. Calculated from Ministry of Finance and Planning, Customs and Excise Department, Annual Trade Report Nairobi, 1983
described earlier, it is evident that much of the equipment manufactured relate to agricultural processing activities associated with tropical countries. Thus, if there is growth here within the total market for machinery, then the probability is that much of the expansion will be accommodated by local production units.

This state of affairs has important implications for the character of the process of production in the branch. Whilst the pervasiveness of advanced foreign technology represents the norm in numerous of the industries involved in manufacturing, particularly as regards food-processing, it is not evident that it has touched the machine-building industry to the same degree. In the cases where it has, then the production technology of the large foreign-owned manufacturers will clearly be similar to that employed by the parent company, with the attendant consequences described previously. The number of foreign firms engaged in the local production of 'mechanical' machinery is, however, extremely small.

For the remainder of the companies belonging to the industry, the technological state of play in both product design and process configuration stands in close conformity to local factor conditions. The explanation for the former aspect has to do with the nature of the machinery produced, in that the basic design of the broad spectrum of standard agricultural equipment is not amenable to extensive changes in design, whilst the equipment employed in the production process, generally speaking, conforms to the universal, standard machine tools to be found in most small engineering workshops the world over. It is a far cry from the capital-intensive technology that is adduced to be inappropriate for the labour-surplus countries of the South.

Even so, the absence of a domestic machine-tool manufacturing capacity has meant that Kenya's medium-sized machine builders, in symmetry with their larger foreign-owned counterparts, must look externally for the supply of their fixed capital. Surprisingly, the numerous Asian entrepreneurs that form the backbone of the firms in this size-range have not been attracted to the 'appropriate' technology produced by the Indian machine-tool industry, and a number of them have complained vigorously about the quality of the equipment purchased.

The fact that all machine tools and most other industrial, electrical, and transport equipment have to be imported, including tractors.1

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would appear to indicate the superficiality of import-substitution efforts in this area. However, the problem has more to do with the nature of the dependency-reducing policies being implemented. A sizeable cross-section of Kenya's machinery-building branch is, in fact, embroiled in a multitude of quasi-productive activities which are directly responsible for the fragility of the underlying technological base. The structure of production in the electrical-machinery industry is a worthy example in this respect, because the majority of the highest value-added components are imported from parent companies. Local industry tends to be concerned solely with assembly operations for products oriented towards the consumer-goods market.

The development of the transport-machinery industry has followed a similar pattern, with no vehicle currently being manufactured locally. Production is instead based on the domestic assembly of foreign produced knocked-down kits. Thus although the Kenyan Government is involved in efforts to increase the local content of vehicle production, it is nevertheless the case that the machinery components incorporating the greatest share of value-added continue to be manufactured abroad. Limited market demand is the major constraint in achieving more integrated automobile manufacturing processes. These problems are not special to Kenya, however. India, in the early development of its vehicle-production facilities, had to struggle to improve the level of local content in manufacture, despite the fact that it had a long history of engineering practices and a population running to hundreds of millions.1

The empirical evidence justifying the assertion that import-substitution programmes have failed to lessen Kenya's technological dependence is offered in Table 4, which presents an economic profile of the development of self-sufficiency in aggregated machinery production.

In the initial push for industrialisation in any country, imports of machinery are indispensable in order to provide the foundation for the gradual replacement of imported engineering items. In the context of

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1 Even though only Ashok-Levland Ltd., of the five civilian motor-vehicle manufacturers, was formally under external control during the early years, the industry as a whole was very much dependent on foreign collaborators. Of the few passenger models manufactured in the country in 1958, only one had an indigenous content of over half; the others ranged from 30-37 per cent. Commercial vehicles were in a like state, ranging from 9 to 58 per cent indigenous content, and averaging 37 per cent. By the end of 1961 the position had improved, but in no case was the import content less than one-fifth, and it still ranged up to one-half. Michael Kidron, Foreign Investment in India (Oxford, 1965), p. 209. The assembly of commercial and pick-up vehicles in Kenya covers Datsun, Toyota, Volkswagen, General Motors, and Peugeot. The local content for Toyota models has reached 30 per cent, and as high as 55 per cent for the Isuzu and Bedford trucks in the General Motors range.
Kenya, however, this later import-replacement stage has not occurred. During the period 1974–82, when statistical data are readily available, the import-substitution effect in the indigenous-machinery sector was non-existent. Import-substitution in this sense refers to the difference between actual imports at the end of the period, and what they would have been if the proportion of imports in total machinery consumption had been the same as at the beginning. In other words, if the import ratio in 1974 is applied to the aggregate demand for machinery and equipment for the next eight years up to 1982, and if the results are compared with the actual imports of machinery and equipment during this period, then the impact of import-substitution may be measured.

The change in imports from a base to a current year can be expressed as:

\[ m = M_1 S_1 - M_0 S_0, \]

where \( M \) represents the import proportion of machinery supplies, \( S \) denotes total machinery supplies, the subscripts \( 0 \) and \( 1 \) referring to the base and current periods, respectively. This change can be divided into two elements:

\[ m = S_1 (M_1 - M_0) + M_0 (S_1 - S_0), \]

Sources: various Statistical Abstracts.

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**Table 4**

Effect of Import-Substitution and Expansion in Demand on Imports of Machinery, 1974–82

<table>
<thead>
<tr>
<th>Year</th>
<th>Machinery Supply</th>
<th>Imports</th>
<th>Import-Substitution Effect</th>
<th>Demand Expansion Effect</th>
<th>Total Change in Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>91,299</td>
<td>67,231</td>
<td>1974,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>99,400</td>
<td>82,213</td>
<td>1975,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>102,870</td>
<td>72,521</td>
<td>1976,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>128,340</td>
<td>90,336</td>
<td>1977,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>156,110</td>
<td>108,518</td>
<td>1978,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>118,730</td>
<td>86,880</td>
<td>1979,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>127,870</td>
<td>97,856</td>
<td>1980,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>133,420</td>
<td>89,358</td>
<td>1981,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>95,100</td>
<td>71,855</td>
<td>1982,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974-82</td>
<td></td>
<td>1,781</td>
<td>2,843</td>
<td>4,624</td>
<td></td>
</tr>
</tbody>
</table>

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1 Sources: various Statistical Abstracts.
where the first term represents import-substitution, and the second the expansion in imports due to the increase in domestic demand.\(^1\)

The results of the analysis indicate that, during 1974–82, when industrialisation was occurring pari passu with the growth in the gross domestic product, there was a substantial expansion in the demand for technology. Moreover, in conjunction with the increase in general mechanical activity there was an expansion in the production of domestic machinery. Import-substitution in machinery, as a result, amounted to over 13 per cent of the increase in demand, a most creditable performance. The slowing of economic growth due to the effect of the international recession, and the closing of the border with Tanzania, meant that progress in import-substitution was not, however, maintained. Demand shrank, producing instead a contraction effect during 1978–82, by almost as much as the previous period’s expansion. Although this led to a considerable decline in the imports of machinery compared to the level operating in 1978, none of this fall could be apportioned to the policies of import-substitution. In fact, the converse; the influence of this strategy weakened, an indication that the import ratio was greater in 1982 than in 1978.

Reviewing the results of the entire 1974–82 period makes dismal reading. Efforts at import-substitution have been ineffectual; indeed, despite some initial progress, there has been an overall increase in import dependency rather than a reduction. The minimal demand-expansion effect signals the reason why: the build-up of indigenous industry suited to the needs of consumer-goods production provides little incentive for the encouragement of domestic-machinery capacity.\(^2\)

\(\text{EXPORT PERFORMANCE}\)

If progress towards the goal of technological self-sufficiency has become locked into an enduring stationary phase, then the export of machinery has by contrast gone into reverse. This may seem a harsh indictment, but as Table 5 indicates, exports of mechanical machinery

\(^1\) This analytical technique is borrowed from Alfred Maizels, *Industrial Growth and World Trade* Cambridge, 1963), pp. 150–2, and its exposition is drawn from Cheng, op. cit. p. 212.

\(^2\) The character of Kenya’s post-independence industrialisation has centred on the development of final-consumption goods industries through the encouragement of multinational investments. Such a strategy inhibits the growth of domestic machine-making capacity as the foreign companies prefer to import their process technologies from the West, conforming to the practices and product standards already obtaining at their parent plants. In addition, local capital-goods producers have been handicapped by the negative tariff protection afforded to machinery manufacturers in Kenya. Zero sales tax on certain categories of imported capital goods have further reduced the viability of local production.
Table 5
Exports of Non-Electrical Machinery, 1977-82

<table>
<thead>
<tr>
<th>Year</th>
<th>Current Value (£'000)</th>
<th>Constant 1974 Prices (£'000)</th>
<th>Index (1977 base year)</th>
<th>Exports as % of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>1,228</td>
<td>1,023</td>
<td>100</td>
<td>51</td>
</tr>
<tr>
<td>1978</td>
<td>1,489</td>
<td>1,172</td>
<td>115</td>
<td>41</td>
</tr>
<tr>
<td>1979</td>
<td>1,510</td>
<td>1,049</td>
<td>103</td>
<td>41</td>
</tr>
<tr>
<td>1980</td>
<td>2,481</td>
<td>1,723</td>
<td>122</td>
<td>47</td>
</tr>
<tr>
<td>1981</td>
<td>1,967</td>
<td>1,253</td>
<td>122</td>
<td>31</td>
</tr>
<tr>
<td>1982</td>
<td>1,590</td>
<td>978</td>
<td>86</td>
<td>18</td>
</tr>
</tbody>
</table>

In 1982, an admittedly recessionary year, were lower in real terms than they were in 1977.

Even though exports of machinery represent less than 1 per cent in value of all exports, they did until the beginning of the present decade account for between 40 to 50 per cent of total machinery output. But even during the recession of 1982, exports still amounted to almost one-fifth of machinery production value. Clearly, then, the export of agricultural equipment to contiguous African countries which are involved in the production of similar crops is of significant potential value to the development of the Kenyan machinery industry. Moreover, the prospects appear healthy that this export potential can be realised to a much greater extent than in the recent past. Government actions and political events have combined to provide the appropriate underlying conditions for Kenya's machinery builders to make an increasing impact on the export scene.

In the first place, although the Government's export compensation scheme has been in operation now for several years, the weaknesses are at last beginning to be overcome, and the programme's biggest criticism, that of delay in recompensing exporters, is gradually being rectified. In addition to the attempts at making Kenya's exports more competitive, there have also been encouraging political and diplomatic developments which lead to much optimism that the trading front can be expanded. Thus, in late 1984 the border with Tanzania was re-opened to trade for the first time since February 1977. Drought and

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1 Source: Statistical Abstract, 1983.
2 The African market for agricultural equipment has been estimated to be between 1,000 and 1.500 million U.S. $ annually, which is supplied by local producers. See East Africa Report on Trade and Industry (Nairobi, 1983), p. 25.
other factors apart, it was the closure of this border, effectively blocking Kenya's exports to not only Tanzania but also Rwanda, Burundi, Zaire, Zambia, and other Southern African states, which precipitated the disappointing export performance of the machinery sector since that date. The removal of this physical trading restriction will do much to rekindle export trade. There has, however, been an equally significant development in the emergence of the Preferential Trading Area.

The treaty for the establishment of the P.T.A. for Eastern and Southern Africa was signed in Lusaka in December 1981 by nine member-states, later increased to 15: Burundi, Comoros, Djibouti, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Rwanda, Somalia, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Five other governments have been involved in the P.T.A. negotiations – Angola, Botswana, Malagasy, Mozambique, and Seychelles – and they have a standing invitation to accede to the treaty whenever they feel able. The P.T.A. has been designed to reduce tariff and non-tariff barriers of trade between its signatories over the ensuing decade, and has a tough timetable. It became operational on 1 July 1984, in the expectation of becoming a sub-regional common-market by 1992. However, the ultimate objective, though no date has yet been specified, is to transform the P.T.A. into a fully fledged economic community.

The initial tariff reductions were calculated from the basic rates of duties applied by member-states on 30 September 1982. For capital goods this implies a quite huge tariff reduction of 70 per cent, a concession which should do much to encourage trade in a region that has a market of approximately 150 million people, with a collective G.D.P. estimated at 55,000 million US dollars. Moreover, the fact that only 9 per cent of the P.T.A.'s total arable land is under cultivation, with merely 4 per cent of the available water supply currently being utilised, suggests that there is tremendous potential for the development of the region's agricultural sector and the related agro-processing industries, including machinery manufacture. The difficulties associated with regional economic co-operation schemes are well known, and the collapse of the East African Com-
Community indicates vividly that they are real enough. During recent years, though, there has been an increasing recognition that regionalisation is an essential element in loosening the long-term development constrictions which enfeeble African countries. More importantly, perhaps, there is a growing realisation by all concerned that such regional collaboration will not work unless the member-states accept an equitable distribution of benefits which are from the outset both unambiguous and certain. The P.T.A. has been constructed on such foundations of realism, it being widely understood that seemingly few alternatives exist to securing 'truly' indigenous development.

The P.T.A. treaty complements two existing multilateral arrangements aimed at promoting integrated regional development within Africa: the Union douanière et économique de l'Afrique centrale (U.D.E.A.C.) and the Economic Community of West African States (E.C.O.W.A.S.). The formation of the P.T.A. is an important enough event by itself, but perhaps its real significance lies in the wider trading developments which it could foreshadow. Viewed from this perspective, the emergence of the P.T.A. marks a further step in the direction advocated by the 1980 Lagos Plan of Action which, inter alia advocated the creation of an African Economic Community by the year 2000, the basic premise being that African development cannot be the automatic by-product of the world economic system. Kenya's machinery manufacturers, being somewhat more advanced than those of other African countries, will welcome, and undoubtedly benefit from, the continent's progression towards the attainment of this free-trading bloc.

1 For informative reading on this point, see Philip Ndegwa, Africa's Development Crisis, Nairobi, 1985.

2 By the beginning of 1985, six of the members, Ethiopia, Malawi, Mauritius, Swaziland, Zambia, and Zimbabwe had started using the P.T.A. clearing mechanism, which is meant to minimise the use of foreign exchange through increased use of local currencies to settle trade transactions. But the effectiveness of this system has been particularly hampered by the huge trade imbalances existing between some of the trading partners. These are already reported to have caused considerable friction between neighbouring Zambia and Zimbabwe, due to the former's huge trade deficit of U.S $12 million which had to be paid for in foreign exchange. See The Daily Nation, Nairobi, 31 January 1985, p. 10.

3 Due to persistent problems concerned with the attainment of self-sufficiency in food production, the policy priority has now shifted from the 1980 Monrovia strategy to that espoused by the OAU at Addis Ababa in 1985, of emphasising the development of agricultural activities. However, sooner or later, either in the increased mechanisation of agriculture, or through future efforts to promote industrial capacity, the need to stimulate capital-goods production in Africa will again have to be recognised.
SOME POLICY PROPOSALS

Once it is accepted that the production of mechanical machinery represents the first phase in the process of gaining technological mastery, there are three broad areas in which the Government of Kenya can act to assist the development of the sector. (1) The growth of capital-goods capacity can be encouraged by removing some of the disincentives and anomalies of the trading régime, in particular by reducing the high cost of imported steels and components. (2) The manufacture of machinery can be directly stimulated, notably by public investment in designated key industries. Guidelines for determining the strategic priority of productive activities should centre on an assessment of their potential contribution to the development of the manufacturing economy, preferably by helping to create a diversified sub-structure of supplier industries. (3) The establishment of an institutional framework can help to monitor, co-ordinate, and generally serve the interests of producer-goods firms in a number of crucial areas.

1. The Trading Régime

The non-emergence of a buoyant capital-goods sector in Kenya has been officially blamed on the restrictionist nature of import-substitution policies,¹ and the authorities are now becoming involved in efforts to liberalise the trading régime. Apart from a series of corrective devaluations of the currency, import tariffs have been lowered in an attempt to induce a greater level of competitiveness in the local market.² The hope being that economic efficiency will be heightened in the manufacturing sector. At the same time it is believed that a reduction of tariff barriers will lead to an erosion of the high-cost, high-profit mentality that currently characterises Kenyan manufacturers. Needless

¹ Cf. Mwai Kibaki, Minister of Finance, during his 1981-2 Budget Speech Nairobi, p. 6: 'The import-substitution focus on protection . . . stifled the growth of new industries by imposing high cost raw materials and goods on the captive domestic market, and forestalled the development of a capital goods industry.' Note also the main thrust of Kenya's Fifth Development Plan, 1984-88, p. 196: 'Priorities in the field of industrial consolidation will include balancing modernisation and expansion of existing enterprise so as to gain maximum production efficiency, product diversification, improvements in the capacity to export and establishment of backward linkages required to replace imported inputs. Promotion and development of producer goods industries will be encouraged where the replacement of imported inputs is possible and economically viable.'

² According to ibid. 'The Government's policy of gradually reducing tariff protection will indirectly serve to stimulate export activity. During the 5th Plan period, domestic producers and investors will find the considerable incentive to export contrasting sharply with the squeeze placed upon production for the increasingly competitive domestic market.'
to say, there are limits to the extent that the Government can go in this
direction, and caution is required, for if the protective walls come
down too quickly, then Kenya’s producers, at a time of severe
under-utilisation of capacity, may find themselves unable to compete.

The Government has indicated its intention to promote viable
capital-goods production at a time when attempts are being made to
 foster exports. It is a fact that the N.I.C.s of South-East Asia have
achieved rapid industrial growth through export expansion policies that
initially concentrated on labour-intensive products whilst, con-
comitantly, pursuing a discriminatory import-substitution approach in
respect of their engineering and intermediate industries. However,
these countries were already at a stage where they had accumulated
impressive technical capabilities. Moreover, even though their in-
dustrial strategy could be described as being ‘neutralist’, it has
nevertheless been pursued, as Manfred Bienefeld argues, ‘alongside a
wide range of specific quantitative restrictions on imports and a panoply
of “non-tariff barriers”, as well as of different specific export incentives,
all of which are particularly easily used in the corporate state models
in question’.

It remains to be seen whether Kenya can implement and profit from
similar industrial policies. A start has already been made by the
manipulation of the duty and tax structure on imports as a means of
providing incentives to local manufacturers. In addition, the authorities
should, in particular, examine ways in which the producers of agri-
cultural machinery can reduce their costs. An important step in this
direction would be to exempt them from duties and sales tax on
imported materials. This would not only allow manufacturers to
compete more effectively with imports, but would provide incentives
for the local production of equipment that hitherto was economically
infeasible.

In an explicit bid to boost exports, plans have been announced
recently to establish what have been termed ‘Manufacturing Boards’
concerned with export-oriented production. Thus, any manufacturer
intending to produce 100 per cent for export becomes entitled to total

1 Government statements during the early 1980s indicated that tariff amendments would
increasingly be employed to aid Kenyan development and, in particular, to foster a capital-goods
sector. Nevertheless, the importance of tariffs in terms of procuring the resources for government
expenditure is as strong as ever; import duties in 1983/4 represented 30 per cent of all indirect
taxes, and some 20 per cent of total taxation, almost exactly the same set of proportions that

2 Manfred Bienefeld, ‘Efficiency, Expertise, NICS and the Accelerated Development Report’,
exemption from duties and sales tax on the required imported materials. In addition, more general policies of assistance should also be formulated, including: easier and longer-term credit, investment allowances, fiscal incentives, testing and quality-control facilities, and, possibly, a specialist agency to assist and advise businessmen in such matters as freight-insurance, marketing, and attendance at trade fairs.

2. Investment Imperatives

The creation of certain industries designed to promote the country’s capital-goods capacity necessarily becomes the responsibility of the state if the private sector proves unwilling to undertake such investments. The Kenyan authorities appear to recognise this, and the 1984-8 Development Plan includes three proposed major capital-goods projects: the mini-integrated steel plant and specialist foundry mentioned already, and the construction of a public sector machine-tool plant.

Although all three ventures are important in their own right, and indeed complement each other in the process of production, the machine-tool plant is especially significant, because the relationship that industry forms with the users of its products is a crucial factor in the generation of appropriate technological adaptation and innovation. It has been proposed that the construction and early operation of this plant should be the responsibility, under a turnkey agreement, of the large Indian public-sector company, H.M.T., and if its feasibility report is implemented, 500 labour-intensive, general-purpose metal-cutting tools will be produced annually, sub-divided as follows: centre lathes 150, grinders 120, pillar-drilling machines 70, milling machines 60, power hacksaws 50, and bench-drilling machines 50.¹ In addition, a training centre for the estimated 270 workers employed at the factory would also be established.

It is important that the planning authorities assign priority to this investment, because even if the construction of the specialist foundry continues to be delayed, the feasibility report for the machine-tool plant indicates that upgrading the foundry facilities of identified local concerns would prove a viable proposition.

The sub-contracting of foundry work is but one example of the type

¹ H.M.T. proposed that the selling price of lathes - the most expensive but probably the tool with the greatest potential demand - should be K.Shs. 138,000, and that over 500 would be purchased if the value of machine-tool imports (K.Shs. 71,700, 13b) for 1982 held. The feasibility team estimated that if production takes place at capacity, then a gross profit to sales of 20.8 per cent, with duties and taxes, would be realised.
of backward linkages that could be generated by the proposed plant. Similar opportunities would exist for tooling, sheet-metal fabrication, electro-plating, and forging. There would, moreover, be a demand stimulus to the component industries for such items as bearings, fasteners, belts, oil seals, electric motors, and hydraulic equipment. Many of these products will have general applicability to industrial activities aside from the manufacture of machine tools. The encouragement of industries involved in the production of such technically convergent items would, therefore, obviously act as a boost in efforts to increase the local content of other diverse machinery products.

Although the machine-tool plant would almost inevitably face some initial teething problems, not all of them technical,1 it is nevertheless the type of capital-goods activity that Kenya needs to pursue, not least because of the export opportunities created by the formation of the P.T.A. bloc.2 Arguments can, of course, be advanced that the transport infrastructure in several neighbouring countries is such as to make the movement of heavy industrial machinery rather difficult and unpredictable, but these obstacles to trade are likely to diminish over time as improved road networks are built to cope with the ever increasing trans-border freight-movements. Kenya ought to plan to be in a position to exploit the potential of African technology trade, otherwise it may lose its chance: Nigeria has already acquired machine-tool capacity through the construction of a turnkey plant from India, whilst Kenya’s southern neighbour, Tanzania, is at an advanced stage of doing the same with the co-operation of Bulgaria.

3. The Need for Consultation

One of the most frequent criticisms raised by the machinery producers is their sense of isolation from the policy-makers in Kenya. Many of the owners and managers believe that government officials are ignorant of their capabilities, and of the wide range of products that could be manufactured given the right economic climate. In addition, complaints are made about delays in processing such documents as foreign-exchange and import-license applications, and certificates of origin. The firms also find difficulty in making representations to the

1. Academics, managers and even government officials emphasise the difficulties surrounding the implementation of large investment schemes which would hurt established vested groups in the country.

2. The P.T.A.’s rules of origin are important in this respect. A condition which must be fulfilled for a product to qualify as originating is that at least 40 per cent local content of materials, or 45 per cent value-added, be associated with its manufacture.
Government concerning the myriad problems of running a business in a highly regulated economy.

To raise the mutual understanding of the public and private sectors involved in the industrial development of Kenya, and to ensure that effective communication is maintained between them, it is felt that a good case can be made for establishing what might be termed a National Consultative Committee for the Development of the Capital-Goods Industry.\(^1\) This could be staffed by representatives of the employers possibly through the Kenyan Association of Manufacturers), trade unions, and perhaps academics, while participation by the Government might also be invited.

The terms of reference of this Consultative Committee should be wide, including responsibility for:

- initiating research studies relating to the growth and development of capital-goods production, ranging from technological investigations to policy-oriented measures to stimulate demand;
- acting as a forum for airing complaints by manufacturers with the aim of communicating a 'consensus of opinion' to the Government on subjects of developmental significance to the industry;
- providing a 'meeting of minds' to instigate and co-ordinate an appropriate national effort for widening and deepening the country's technological capabilities;
- encouraging inter-regional trade and industrial co-operation within Africa, as well as export possibilities elsewhere in the world.

These three policy-areas can only be viewed as a first stage in the practical recognition by the authorities concerning the importance of stimulating capital-goods production in Kenya. But the significance of the issue will undoubtedly grow with the passage of time, for the creation of adaptive and innovative technology in Africa is an investigative area that invites much conjecture, not least because the continent represents an elusive 'last frontier' to economic development.

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\(^{1}\) Venezuela has what is called a National Council, Consibeca, for promoting the capital-goods sector, with wide objectives, see U N E D O . \(^{1}\) The Capital Goods Industry in Latin America: present situation and prospects\(^{1}\), Working Paper No. 10, Geneva, July 1984, p 14. Technological complementation also takes place in Latin America, for example, in the metal-working industries of the Andean countries, see ibid., p 109. Although Tanzania has iron ore and Kenya the potential of steel-making expertise, it is doubtful whether these East African countries are ready as yet for such complex co-operative ventures.