

Industrial Development, Technological Change, and
Institutional Organization: The Kenyan Case

by

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Paper presented to a conference on "The
Implications of Technology, Choice on Economic
Development" organized by the Appropriate
Technology International of the USA, the
Queen Elizabeth House of Oxford University,
and the Kenya Economics Association.

August 29-September 2, 1988

Nairobi, Kenya

INTRODUCTION

Though little studied, government policies, institutional arrangements, and conflicts between economic interest groups often severely restrain Kenya's technological development. Tariffs policies discourage the local manufacture of machinery and agricultural equipment; multinational corporations (MNCs) feel little impulse to use more locally-made components and materials;¹ research and development (R & D) is haphazard and focusses too little upon production-related issues; and the political system hardly responds to recommendations for fundamental policy and institutional reforms not backed by the clout of aid donors. Special interests linked to importers or lethargic monopolies often find political allies to press for concessions or administrative decisions which, more often than not, hamper development of indigenous technological capabilities.

Despite these deficiencies, the nation's industrial base and technological capabilities have been growing. And with that, domestic economic and political forces have been cumulating, thus creating a basis for shifting to a national technology-led development strategy. The interests linked to imports and big monopolies are increasingly under attack.² The way the manipulations and inefficiency of merchants thwart the growth of small industries is also better known now (Coughlin 1986c). The Kenya Association of Manufacturers, the Federation of Kenyan Employers, affected labour unions, and some politicians are increasingly calling for the systematic isolation of these anti-developmental forces, especially importers bringing goods that massively disrupt local production, e.g., refined sugar, ceramics, and jute bags. This suggests that diverse national interests may be converging, ready to shift the balance in favour of policy and institutional reforms for consciously stimulating growth of the nation's technological and industrial capabilities.

The main thesis of this article is that Kenya needs systematic policies and a coherent institutional framework for accelerating the acquisition and indigenous development of technological capabilities. Policies forcing the pace of technological development can provide an internal economic impetus calling forth investment in the underdeveloped but productive sectors of the economy.

The article starts by reviewing the conceptual issues concerning technological change, institutional re-organization, and the political economy of the evolving domestic interests and external influences. It then reviews Kenya's technological history in the context of institutional and political change and outlines the strengths and limitations of the current policies and institutions. Finally, it presents specific guidelines for new policies and institutional arrangements, considers realistic

time scales for the reforms, and evaluates the confluence of political interests benefiting or losing from those measures.

CONCEPTUAL ISSUES

Technological development and industrialization are closely interrelated. Technological change in manufacturing involves technical and managerial skills, choice and development of process technology and products, and interindustry linkages. Technology policy cannot just focus on micro decisions about process or product technology and the macro policies influencing those choices. It must also focus upon how increasing one industry's capabilities, demand for inputs, and supply of products or services helps other industries by enabling them to achieve economies of scale, reduce input costs, or provide critical technological capabilities needed to produce certain products locally. Thus, the development of a nation's technological base cannot be divorced from the broad issues of industrialization. This article, therefore, considers technological policies and institutions plus the problems of creating a well linked and complementary industrial structure.

Political economy, government policy, institutions, and technological development interact dynamically. In the long term, technology and the economic base fundamentally influence institutions and political relations. But in the medium term, the latter strongly influence the direction and speed of technological transformation. Though evolution of technology may partly have its own momentum, institutions and government policy can hamper or accelerate, and scatter or focus efforts to acquire new abilities or to solve problems. Hence, identifying these deficiencies and evaluating possible institutional and policy reforms is important.

On the other hand, if the political circles repeatedly shy away from fundamental restructuring and policy shifts when the institutions or policies are manifestly not functioning well, then one must look for the political and economic reasons behind that reticence. At root, big financial interests may be at stake. This analysis, therefore, encompasses political considerations and vested interests in an comprehensive/eclectic approach (Stewart 1984: 93).

A BRIEF HISTORY OF KENYA'S TECHNOLOGICAL INSTITUTIONS AND POLICY ENVIRONMENT FOR MANUFACTURING

Twice this century, the government adopted policies to induce rapid improvements in local technological capabilities. During World War II, the colonialist were cut off from most imported supplies. In response, in 1941, they set up the Kenya Industrial Management Board and its affiliate the East African Industrial Research Organization, the predecessor to the Kenya

Industrial Development Research Institute (KIRDI). They also initiated some new import-substitution industries (Anyang' Nyong'o 1986).³ After the war, the impetus toward local technological development lessened. The pressure was off.

After independence, the government used high tariffs and import licensing to encourage a wave of investment in import-substitution industries, e.g., beverages, textiles, furniture, paper, non-electrical machinery, pharmaceuticals, and steel rolling (Eglin 1978: 3.13). These industries depended heavily on imported machinery and inputs; and the government lacked the policies and many of the institutions needed to break that dependence.

The policies and institutions affecting technological development in Kenya's manufacturing sector have evolved disjointly, often in response to a crisis, e.g., the rapid expansion of import licensing and non-tariff barriers after the breakdown of the Bretton Woods system in 1971 and the first oil crisis in 1973 (Ng'eno 1986: 6). As a result, Kenya does not have a systematic and comprehensive policy to govern the transfer of technology and to guide the development of local technological capability.⁴ Sessional Paper Number 1 of 1986, Economic Management for Renewed Growth, is completely silent about technology policy. The Development Plan 1984-1988 merely describes the major tasks of various research institutes, but it has no systematic plan for rapidly enhancing technological capabilities in the country. Moreover, the World Bank's (1975) Kenya into the Second Decade, which inspired many of Kenya's policies in the 1970s, does not even have the word "technology" in its index or table of contents.

Certain aspects normally expected in a comprehensive policy toward technology do not even exist in Kenya, e.g., manpower planning and policies toward product technology. One technological and industrial policy that was functioning poorly was abolished, instead of remedied, in 1985, i.e., investment licensing for projects valuing more than KSh 5 million. In so doing, the government forsook one of its most powerful tools for planning economic and technological development: the power to steer investments away from undesirable projects and into high priority sectors.

Other policies, despite their inappropriateness, were simply carried over from the colonial period, e.g., the laws governing patents and brand names. The government also appears to insufficiently appreciate the high costs incurred when it provides inadequate staff and guidance for economically strategic institutions such as the Central Tender Board and the Bureau of Standards.⁵ On the other hand, policies toward the indigenization of posts held by expatriates have been more consistent, though a re-evaluation may now be in order.

Given these policy inadequacies, most research is not well synchronized, education and technical training is not guided by manpower planning, nor are industrial investments consciously guided or scrutinized so as to enhance local technological

capabilities. Consequently, the country has lost much money from poorly designed or inappropriate projects, e.g., for furfural, power alcohol, glass, steel, and fertilizers (Khalil 1987; Juma 1986; Coughlin 1985a, 1986d, 1986e; Gachuki and Coughlin 1988).

The institutions for gathering and providing information about the technological capabilities in the country or available from abroad are, moreover, chaotically organized and leave many gaps in needed information. A pinnacle for the technological information system does not exist since the National Documentation and Information Centre is sorely underdeveloped (Kenya Govt. 1984: 139). It should, but cannot yet, receive, analyse and channel technical information to likely users. Already a lot of technical information exists in or arrives to Kenya. But it is not organized or centralized. And above all, there is a severe deficiency in the ability to analyse that information and get it to users.

Often companies import inputs, materials, and consultancy services out of ignorance that a local source exists. Just learning about who has the desired information necessitates a costly, and perhaps unrewarding, search. Moreover, since Kenya simply registers patents awarded in the UK and does not have its own patent system, the Registrar of Patents office does not have data on old and new patents granted throughout the world. Hence, it cannot help individuals and firms search for useful technologies.

Other institutions--KIRDI, the Industrial Promotion Department of the Ministry of Industry, the Industrial Promotion Centre, the Kenya Bureau of Standards, the Central Bank, the Export/Import Department, the External Assistance Department, and the National Council of Science and Technology--frequently make decisions affecting technological acquisition and development. But they are not consistently inspired and co-ordinated to search for ways to stimulate the development of indigenous technological capabilities. For example, the Council of Science and Technology uses much of its resources for social science research, and very little for technology related research. Or, for instance, the External Assistance Department:

... has no regular or institutionalized links to industry; nor does it have economists well versed about Kenyan industries on its staff. Intermittent liaison with economists in other departments within the Ministry is insufficient; the task requires a full-time economist whose main responsibility is to increase the local content in aid projects. Lacking such contacts and information about what can be produced locally, the Department is ill-positioned to know how to negotiate so as to increase local content. Moreover, Kenya exploits only a small portion of its potential maneuverability in negotiating to increase local sourcing for inputs for aid projects (Coughlin, Mwau, and Begumisa 1988: 16).

As a result, these institutions provide an inconsistent, weak, and dissipated impulse to technological development, especially in manufacturing. And the Department of Planning has not even recognized this lack of synchronized effort as a major problem needing remedy.

Certain private institutions capable of stimulating technological development are absent or underdeveloped. Locally funded private foundations for funding technology- and production-related research do not yet exist. Also, the few existing venture capital firms (e.g., Industrial Promotion Services) are mostly unwilling to finance product research and development. They, similar to the finance houses, prefer to fund proven innovations.

Finally, the ability of the universities to assist in production-related research is underused. Only this year did the University of Nairobi's Vice Chancellor clearly state that the University would encourage lecturers to do consultancy work, so long as it did not interfere with their responsibilities on campus. The University's Industry Link committee was set up in 1987. These developments should increase the university's contribution to production-related research.

In addition to institutional and policy deficiencies, some political/economic forces have significantly hindered the country's technological development. After achieving considerable success in shallow import substitution, the government did not proceed to adopt policies to encourage companies to use more locally-produced inputs (Coughlin 1987).⁶ Its earlier import substitution policy had nurtured a strong coalition of import dependent industries, merchants, distributors, and politicians who effectively opposed policies to help new industries make intermediate inputs locally. This coalition has been so powerful that certain urgently needed reforms have not even been the focus of serious political discussion, e.g., the need to rationalize the vehicle assembly industry and severely limit the number of makes and models of transport vehicles made or available in the country (Murage 1983; Coughlin 1985b; Obere 1987).

THE IMPACT OF SPECIFIC POLICIES ON LOCAL TECHNOLOGICAL CAPABILITY IN MANUFACTURING

Trade Policies

Trade policies concerning tariffs, licensing, and technology transfers have been fraught with difficulties that have slowed growth of the nation's industrial technological capabilities.

Tariffs and Export Compensation. As recognized by the government, the tariff schedules have been inconsistently generous and punitive toward domestic manufacturers. Some industries are negatively protected since tariffs on their inputs

are greater than on their outputs. For example, imported refractory bricks and most agricultural machinery have a zero import duty while the imported inputs have a stiff tariff though they are not available locally. Many agricultural implements and spare parts also have higher duties on inputs than on the output (Kerre 1985; Coughlin 1985a, 1985b). Also, the Kenya Bureau of Standards discriminates against local manufacturers by not inspecting imports but imposing standards for domestic products. Reportedly, the Bureau plans to initiate inspection of imports. But will proper personnel and adequate financing really be available?

In an insightful article examining the mistakes and implications of the stillborn Kisumu-power-alcohol project costing the government US\$ 125 million, Juma (1986: 3) observed:

The choice of technology was largely influenced by the existing institutional arrangements governing financial matters. The choice of technology was, therefore, not a simple instantaneous decision but a complex process that was linked to both financial policies and subsequent project implementation. Kenya's technology-related policies, especially those on machinery importation, were designed to facilitate the importation of whole plants under the import substitution strategy pursued in the 1970s. These policies allowed low or no import taxes on machinery while they placed heavy taxes on engineering raw materials. This distortion encouraged the importation of turnkey plants while at the same time inhibiting the local fabrication of such machinery or their spareparts. Under such conditions, investment projects most likely contained a high foreign exchange content. As a result, industrial projects tended to rely on borrowed finance and the government often offered to guarantee the foreign loans.

In some cases, an anti-export bias also exists whereby the tariffs on required imported inputs are greater than the export compensation (Coughlin 1985a and 1986c). Many industries are not permitted to receive export compensation to offset the tariffs they pay on inputs (e.g. for electrical cables and cold-rolled steel). The government has also promised to remedy the extreme delays in the export compensation scheme which have severely diminished its effectiveness.

Import and Export Restrictions by MNCs. Many MNCs apply severe import and export restrictions on their subsidiaries operating in Kenya.

Of 34 foreign-owned or partly foreign owned firms in the sample of 55, 19 had explicit understandings with their parent companies which prevented them from seeking export

markets either at all or outside specified areas (Low 1982: 300).

Another study of 25 technology transfer agreements in Kenya revealed that 36% of the contracts had tied-import requirements, 32% contained export restrictions, and 24% had post-expiry restrictions on the continued use of the acquired technology (Ebangit 1985: App. Table 11). Sometimes subsidiaries also prefer to obtain imported inputs from their mother companies even when those inputs can be produced locally. Kenya has no systematic mechanism for vetting technology transfer agreements to disallow such trade restrictions.

Pressures for Import Liberalization. Internal vested interests and the World Bank have pressed the government not to adopt tariff and other trade policies to increase protection for industries desiring to produce materials and components that are currently imported. The World Bank has made increased import liberalization and reduced price control a condition for continued funding for Kenya.

Though import liberalization is appropriate for many products, caution is required not to flood markets with imports and thus stifle local production, e.g. of ceramics, textiles and refined sugar. Prolonged, excessive protection of domestic monopolies breeds inefficiency, price gouging, and consequent defensive over-investments in redundant capacity by some of the monopolies' customers. But the current overall success of the burgeoning textile industry -- despite a few sick or convalescing companies -- should warn against a premature abandonment of support for new industries (Coughlin 1986c).

The need to identify and then encourage and protect industries contributing to the development of a well-complemented, interlinked industrial base is almost ignored in the World Bank's prescriptions for the liberalization of developing countries' imports. Back in 1975, the World Bank advised Kenya to adopt:

...two changes of emphasis within industry. The major change would be a relative switch from import substitution to resource-based export industries [p.35]. ... The need is to replace the past emphasis on protection and import substitution with an increasing emphasis on productivity and export promotion. In particular, it is most desirable for Kenya to avoid going through the second stage of import substitution (protection of intermediate goods) with the additional taxation of the rest of the economy which this brings in train [p. 40].

In 1987, the Bank implicitly acknowledged that the earlier advice had been wrong, at least in part. It reported that 64% of Kenya's industrial growth between 1976 and 1983 was due to increasing import substitution, 41% from increases in domestic

demand, and negative 5% was from exports. But now the Bank proclaims that the old medicine must finally be correct since imports as a percentage of domestic supply declined from 44% in 1972, to 36.4% in 1980, and 19.3% in 1985 (World Bank 1987: 5). The recent report argues that "opportunities for further import substitution are running out except in subsectors in which Kenya is not likely to have a competitive advantage in the near future" (p.5). It asserts that, "Industrial growth will depend entirely on growth of domestic demand ... unless Kenya makes a substantial entry into export markets ..." (p.9).

This analysis fails on three counts. Strong reasons exist to suggest that the Bank's export optimism could be exaggerated. The Bank's analysis did not consider that as a country becomes less import dependent, the multiplier effect -- of special importance in a country with much unemployment and underused capacity -- from further import substitution is yet greater. The Bank also ignored micro-level evidence of significant opportunities for further import substitution.

The Bank advocates a shift toward export promotion and away from import substitution. But is its current export optimism justified as the basis for the nation's development strategy? The quantum index of all export from Kenya only increased from 94 to 114 between 1979 and 1986, an average of less than 3% p.a. The Bank itself reports that developed countries have become increasingly protectionist particularly against industrial and processed agricultural imports from developing countries (World Bank 1987: 133-153; 1986: 111-119; 1985: 37-42). For example, "the extent of non-tariff barriers more than doubled in the United States between 1980 and 1983 and increased by 38% in the European Community" (World Bank 1985: 40). UNIDO (1986: 139) argued further that:

The advantage of inexpensive labour ... could even be wiped out by new forms of protectionism in the North, by technological break-throughs, or by a combination of both.

Moreover,

The slow-growth syndrome in the North suggests that the era of export-led industrial growth in some parts of the South may be passing. ... New sources of industrial growth must be sought. ... South-South co-operation ... may provide such a source, together with internal stimuli arising from the linkage of progress in agriculture with industrial growth (UNIDO 1986: 139).

Though policy and administrative changes to promote more exports deserve a strong endorsement, the Bank's de-emphasis of import substitution is likely to be wrong again. Numerous opportunities still exist for further import substitution, mostly to provide raw materials, components, and machinery for industry and to improve efficiency in using imports inputs.⁷ Of course,

new industries would initially require moderate protection from imports, contrary to the thrust of the Bank's recommendations to liberalize imports. In practice, however, there may be less contradiction with the Bank than might seem likely about the level and duration of infant industry protection warranted for specific projects. The Bank is sometimes more flexible in practice than in principle, especially when a government, which is just in moderate need of additional external finances, resists the Bank's initial demands.

The danger, though, is that by downplaying the significance of further import substitution, the government could fail to adjust policies so as to steer investment into new activities needed by the nation to build an increasingly interdependent manufacturing sector and enhanced technological capabilities.

The history of most countries that have industrialized or are progressing significantly (e.g. the USA, Canada, Germany, Japan, China, Brazil, S. Korea, Taiwan and India) shows that prolonged protection of the domestic market (i.e. lasting several decades) was often necessary to strengthen local industries before they could compete internationally (Kemp 1983). Maxwell (1982) showed that learning periods for steel plants in a IDB-ECLA study varied from one to 11 years. Katz (1982) found that firms took between two to four decades to reach technological maturity. Clearly, a long-term historical perspective is required.

Many aspects of inefficiency are outside a firm's control (e.g., infrastructure, inefficiencies in the supplying industries, need for large stocks, small markets and the initial inability to achieve economies of scale, and consumers' preferences for imports). Even internally caused inefficiencies can take a considerable time to overcome (e.g., unsophisticated management skills, the development of systems for internal controls, proper training and incentive systems for workers, quality consciousness and the acquisition of industrial skills and habits by workers).

Condemnation of an industry for inefficiency after merely four or five years of its existence is ill advised. The 1978-1983 Development Plan (p. 336) declared that "enterprises ... in existence for more than five years, will not be accorded infant industry status". Pressures are needed to encourage efficiency, but doing this through imports of locally producible goods is extremely costly in foreign exchange and runs the risk of snuffing out local initiative if done too abruptly. Distressed, unprofitable, and ill-liquid firms facing a local market flooded with imports have their difficulties compounded due to the shortage of funds for inventories, equipment repairs, and urgently needed renovations.

Foreseeing the current efforts to push developing countries into premature efforts to liberalize imports, Ulysses S. Grant, President of the USA in the late 1860s, poignantly observed:

... for centuries England has relied on protection, has carried it to extremes, and has obtained satisfactory results from it. There is no doubt that it is to this system that it owes its present strength. After two centuries, England had found it convenient to adopt free trade because it thinks that protection can no longer afford anything. Very well, then, gentlemen, my knowledge of my country leads me to believe that within two hundred years, when America has gotten all it can out of protection, it too will adopt free trade (retranslation as quoted by Frank 1979: 99).

Dogmatic insistence that increased competition from imported goods will force ailing industries to improve their efficiency and product quality is bad advice and very costly in foreign exchange. Sometimes this medicine is needed; sometimes it will kill the patient. Of course, some industries should not be started or do not deserve protection and should be allowed to die, especially if the local value added is low and the natural resources are lacking, e.g., for primary steel production from imported ores and coke.⁸ But if promise of a long-term comparative advantage exists, then an industry may need less external competition in order to consolidate its market and financial position and to enhance its administrative and technical capacity. Having already achieved this, others may be strengthened through external exposure, e.g., France in the late 19th century (Gershenkron 1979: 11-12). Only a specific diagnosis of an industry can reveal the correct medicine.

Financial Policies

Most lending by commercial banks goes to commerce, real estate, and transportation. They invest relatively little in manufacturing. And of that, most is short-term. The government's big development banks--Industrial and Commercial Development Corporation (ICDC), Industrial Development Bank (IDB), and Development Finance Corporation of Kenya (DFCK)--have concentrated on industry. But Ikiara (1986: 10) found:

The three finance companies share the following common investment patterns:

- large investments in low-priority industries or low-priority enterprises within a particular industry;
- lack of clear priority in their investment programmes;
- evidence of investment concentration in particular companies, for instance, ICDC's investment in East African Industries;

- over-investment in industries already suffering from excess capacity, e.g., in the textile industry.

Partly explaining this latter problem, Ikiara (1986: 9) observed:

Investment by these three institutions has often overlapped. While overlapping investment may help to diffuse investment risk among the individual financing institutions, it can also lead to poor co-ordination and weaken the responsibility of any individual company for developing particular industries. This could undermine the co-ordination and supervision of industrial development (Ikiara 1986: 9).

The banks have been mostly passive promoters of industrialization. Rather than mostly awaiting proposals from entrepreneurs, the banks could follow a different model and perceive themselves as dynamic agents channeling funds into priority economic sectors that are underdeveloped, e.g., the development of high precision machining and foundries, some resource-based chemical industries, and farm implement and equipment firms. For example, last century the German, Austrian and Italian banks aggressively promoted selected industries, worked hand-in-glove with management, and "refused to tolerate fratricidal struggles among their children" (Gershenkron 1979: 14-15). The bank's role, "particularly appropriate in the late-comer, [was] ... to promote industrial development, to act as entrepreneur and capital-provider by breaking down the reluctance on the part of savers to invest at long term" (Kemp 1978: 79).

If the big development banks reconceived their roles, they could work closely with the government to steer investment into critical, but underdeveloped or non-existent industries. Their vision must be clear: to build up a well linked and complementary industrial base. Redundant or low-priority investments must be shunned.

Policies Toward Manufacturing Research and Development

Policies do not exist to vigorously encourage manufacturers to increase their technological capabilities or to conduct research.

The role of science in industrial production is still marginal in Kenya, partly because the industrial sector is largely linked into the parent firms in the industrialized countries from which it draws scientific knowledge. Indeed, nearly all contracts between Kenya and foreign technology suppliers guarantee the transfer of new scientific and technological knowledge. However, when plants become operational, they face problems which require the generation of localized scientific knowledge (Juma 1986: 19).

Despite the need for more privately initiated research, especially in industry, manufacturers receive no income tax breaks, tariff reductions, or other incentives for R & D efforts.

This contrasts sharply with many other countries. For example, India gives manufacturers a 125% additional tax deduction for R & D costs, exempts R & D equipment from customs duties, and allows "accelerated depreciation on this equipment, and special investment allowances (and licensing privileges) for units using local technologies". It also gives "liberalised and preferential import facilities for units setting up R & D laboratories. ... There is little doubt that the policy for stimulating in-house R & D by manufacturing units has been very successful" (Lall 1984: 234).

Procurement Policy

Most of the government's large purchases go through the departmental and ministerial tender boards or the Central Tender Board (CTB). Despite the significance of these purchases, the government has not used them to systematically encourage the growth of indigenous industries and technological capabilities.

Discussions with members of Kenya's CTB revealed that there have been no serious efforts to use the tendering system to influence the economy. According to one member of CTB, the main criteria considered in awarding government tenders in the country are the prices of the items, the quality of the supplied samples and the reliability of the tenderer. Foreign-exchange content, linkage effects, employment creation, etc., are hardly ever considered in the awarding of tenders. Most CTB officials were not aware of the role that the tendering system could play in the economy. This limited awareness of how the national tender system could be used for wider economic benefit, and the corruption in the system, have seriously limited the usefulness of the tendering system in the country (Ikiara 1986: 24).

Being a very large purchaser in the Kenyan market, the government could use its purchases systematically to encourage local entrepreneurs to begin to make new products locally. At first the quality may be lower than that of imports, but the government could set increasingly stiff quality standards to be met by local producers. This would gradually enhance their technological capabilities with favourable implications for other products and using industries.

The recent decentralization to the 41 districts for many government tenders has unintendedly boosted the purchases of imported supplies. Previously, when offering a bid to the Central Tender Board, local manufacturers often had a competitive

edge over imports since they could supply the goods in bulk at an ex factory price without trade mark-ups. Now they have to sell their products in small lots to diverse governmental organs at a higher price including trade and transport margins. Moreover, imports often have an advantage since the small lots purchased by district governments do not allow local firms to achieve economies of scale. Though important, this criticism is not valid for all products, e.g., items made in the informal sector or in local industries with a large output and good distribution channels. Therefore, deciding which products to have tendered in the districts requires product-by-product analysis.

Policies toward Royalties, Licences, and Trademarks

Kenya has no laws regulating the conditions and limits for royalty, licensing, and trademark fees. The country has no legislation:

... dealing specifically with negotiating with foreign investors. Nor is any specific institution charged with negotiating with or supervising negotiations with foreign investors. The machinery of negotiation ... consists mainly of ad hoc administrative practices (Gachuki 1981: i).

The Central Bank has an understaffed unit providing insufficient review and limits on the huge royalties and licensing fees Kenya pays abroad. The nation would save much -- as many other countries have -- by more thoroughly and competently scrutinizing and regulating these payments (UNCTAD 1981).

Some items (e.g., fire extinguishers, pumps, cookers, safes) are assembled or partially manufactured here under licence with foreign firms even though adequate local capacity exists to make nearly all their components and then to assemble them. Thus licensing can sometimes hamper learning and the acquisition of technological capabilities. Often capable potential producers of an item are forced into a licensing agreement just to obtain a foreign label needed to penetrate the local market since buyers often favour foreign labels, e.g., for men's dress shirts and manhole covers.

The excessive use of licensing agreements leads to (i) remittances abroad of licensing fees, (ii) more than necessary imported components, and, (iii) illegal transfer pricing for purchased components that must be obtained from the licensor.

Patents

Kenya's Patent Registration Act was passed under the colonialists in 1933 and has not been substantially amended since then. Under it, only patents registered in England "shall" be registered here. Kenya does not have its own patenting

procedure. Kenya's then Attorney General stated that the law "should be enacted throughout the empire in the interests of British industry and the British commerce as a whole" (Owiti 1980: 30). Unlike many developing countries, Kenya's law does not even require the patent holder to make the product locally and in sufficient quantities to satisfy the domestic market.

The continuing subservience to England's patent law makes Kenya pay royalties or licensing fees to produce items even when the designs are simple and sufficient technical capacity exists to produce these items here without dependence on foreign "know-how", e.g., certain pharmaceutical products, spare parts, and equipment (Owino 1988: 11; Coughlin 1985b).⁹ And Kenyans still get almost no benefit from this law.

Between 1970 and 1978, 1025 patents were registered in Kenya -- only five of these were by "Kenyans" (Owiti 1980: 84 and 87). But upon investigation, three of those turned out to be subsidiaries of multinational companies (Coughlin 1985b: 183). Even when a local subsidiary of a multinational corporation makes an invention, almost always the parent company registers the patent and brand names (Kaplinsky 1978: 239). Any royalties that might be earned would not flow to Kenya.

Unlike other countries such as Japan and Brazil, Kenya does not grant intermediate protection--or utility certificates--for small innovative steps that improve products which are at less than the most modern "state of the art."¹⁰ Utility certificates for 7 years are typically given exclusively to a country's citizens for innovations that do not merit a patent, but do go beyond mere industrial designs and represent an innovative step.

These certificates can help upgrade traditional technologies and encourage local firms with industrial designs to improve them yet more so as to warrant a utility certificate. This form of protection is practical because the R & D required for such an innovation is usually far lower than what is needed for an invention meriting a patent. This is more affordable and attractive to many small- and medium-sized entrepreneurs in developing countries. The existence of such certificates also encourages citizens to search globally for products that are not at the state of the art, but would nevertheless be an improvement over what is available locally. As happened in Japan, utility certificates can help to gradually narrow the gap between the technology currently being used in a country and the global "state of the art".

Too Many Makes and Models

Though initially holding considerable promise to stimulate further investments by components manufacturers, the vehicle assembly industry has been decidedly slow and "undynamic", as one managing director termed it, in promoting local sourcing for inputs. A major reason for this is the incredible proliferation of makes and models of transport vehicles in the small Kenyan

market. In 1976/77, Kenya assembled 30 models of trucks, buses, and pick-ups in 12 makes; by 1984, 94 models (about 80 basic types) in 18 makes were being made (Murage 1983: 83); and in 1987, 88 models and 26 makes including some cars were assembled in Kenya (Obere 1987: 47). The country began to assemble cars in 1985; by 1987, 14 models were being assembled locally (Obere 1987: 92-95). The country also has some 200 models of sedan cars in about 65 makes on the streets. This contrasts sharply with India which for years only permitted three models of cars to be assembled locally until the country was able to make almost all components locally. In Kenya, the failure to rationalize this industry by drastically reducing the number of makes and models severely hampers the development of many other economic sectors in addition to tying up tremendous sums of capital in unproductive spare-parts inventories.

So long as the chaos of so many models is allowed, Kenya's foundries and metal engineering industries will be crippled (Coughlin 1985b: 180). And these industries are critical to the development of technological capacities in other industries. In 1983, a company of Yugoslav Engineering Consultants, GOSTOL recommended to the Kenya Ministry of Industry that the current size of the Kenyan market would justify the establishment of a high precision grey iron foundry if the vehicle assembly industry were rationalized (GOSTOL 1983: 41). That foundry would not only make original equipment components and spare parts for many industries but it would also stimulate the further local manufacture of machinery and agriculture equipment (Coughlin 1986a: 154).

The feeble policy toward the vehicle assembly industry has had adverse consequences for a wide spectrum of related industries. With decisive guidance, this industry could become a motive force for economic growth and technological advancement. On the other hand, the vehicle assemblers and their numerous distributors and political allies would lobby intensively to abort or at least to impose detrimental compromises on any programme to rationalize the industry. Clarity and a firm political will would be required. The opportunities are large; the task is urgent.

Similar problems and opportunities exist for other products where Kenya's domestic market is now large enough to permit one or two efficient producers if the market were consolidated by reducing the number of makes and models available (e.g., cookers, refrigerators, single-cylinder internal combustion motors, and large single-stage pumps).¹¹ Decisive policies to consolidate the market are required to enable manufacturers to break out of a low-level production trap, achieve economies of scale and decrease the country's import dependence. Standardization of some other products (e.g., glass and plastic-bottle designs) would also allow companies to achieve economies of scale and reduce per-unit costs.

Policies toward Inappropriate Technologies

Many inappropriate and sometimes even dangerous products are made and sold locally though they may throw artisans out of work and waste foreign exchange. For instance, Kenya makes plastic baskets for the local market even though hundreds of women weave sisal baskets for their livelihood. In fact, an imaginative variety of splendid sisal baskets are exported. Kenya makes many other inappropriate products that eliminate jobs, e.g., plastic chairs that throw carpenters out of work. Other products waste foreign exchange. Throw-away pens require additional imported raw materials to make replacements; fibre-glass tables and chairs require imported resins; and high rise buildings need imported elevators and large structural steel sections. The common milk carton, Tetrapak, costs much more and uses nearly twice more foreign exchange than plastic sachet bags such as used in the small dairies in Meru and Kilifi (Coughlin 1986b: 24-25).

Some products are objectionable for other reasons. Plastic "cheaters" to create a hidden empty space at the bottom of skin-cream containers are allowed in Kenya although they are prohibited in most developed countries. Even dangerous products are sometimes allowed, e.g., skin lighteners and asbestos insulation (Coughlin 1986b: 2).

The widespread use of mabati (i.e., corrugated galvanized steel roofing), which has 66% foreign-exchange content and creates few jobs, deprives the country of thousands of jobs when compared with clay tiles. Moreover, clay-tile and brick factories are labour intensive, use little foreign exchange, and could be located near towns and small cities (Coughlin 1985c).

On the side of production technology, one glaring example of an inappropriate technology costing Kenya thousands of jobs and much foreign exchange is the use of tractors instead of animal-drawn carts as done in India in the first, near zone around sugar factories (Coughlin, Odada, and Owino 1986: 94). A switch would pump roughly an additional KSh 125 million annually into the Nyanza sugar belt and create more jobs than at the sugar factories, not counting farmers and cutters.

Artificially Low Deletion Allowances

The global financial interests of some multinational corporate (MNC) subsidiaries makes them prefer not to obtain components locally, or to refrain from investing to upgrade their products before exporting. Though not generally known, the setting of artificially low deletion allowances is a major method used to financially pressure a local assembler to obtain components only from the licensor company. This discourages local production. The deletion allowance (also called omit allowance) is the refund given by the overseas supplier for an item not imported in a CKD (completely knocked down) kit. For example, if a local assembler prefers to purchase locally the

pedals for a bicycle and to omit them from the imported kit, a deletion amount is subtracted from the price of the kit.

Since locally-made components usually cost more than this deletion allowance, quite logically, local assemblers prefer to continue to import. But the deletion allowances are often set below the production costs in the mother country. The production manager for a large Kenyan vehicle assembly plant figured that the deletion allowance for electrical wire harnesses is about 70% of the production cost in the mother country. The deletion allowance was 30% below their production cost. He thought that this would be common for most vehicle components. For instance, though the deletion allowance for a rough door for a pick-up was about US\$ 50 in 1984, its price including freight as a service replacement part from the manufacturer was US\$ 212 when sold to the local assembler. A local stove assembler said that the deletion allowances for stove parts averaged only 40-50% of the mother company's production costs. Given such artificially low deletion allowances, even an efficient local manufacturer of components would most likely be unable to compete against components that come in a kit.

Despite the key role that low deletion allowances play in hindering Kenyan industrialization and technological development, deletion allowances have attracted no significant attention within the government (Coughlin 1986a: 152-3).¹²

Kenyanization of Top Management Posts

Two decades after independence, the top positions (e.g., managing director, financial controller and production manager) in most large manufacturing firms are still held by expatriates. Though an increasing pool of competent young African managers is being developed, these top-level management positions are usually not held by Africans in MNCs and non-African, Kenyan corporations.¹³ Though sometimes ruled by incompetent political appointees, the commercial and manufacturing parastatals have served as the major training ground for sharp, high-level African managers. For the topmost positions, the multinational corporations have usually been guaranteed the nearly perpetual right to designate expatriates supposedly justified by the need of the foreign investor to maintain a "presence" in the local company. But this is expensive and it deprives Kenyans of the chance to manage their own economy and gain experience. If desired, a "presence" can be established by granting the MNC the right to appoint lesser officers with in-house auditing powers. True, there is still a severe shortage of competent local managers. But many do exist. The time has come to question the wisdom of guaranteeing multinational companies -- especially those that have been in Kenya many years -- the automatic right to hire expatriate managers. Though Kenya suffers a shortage of qualified managers, these top posts should at least be open for those who want to contest for them. Also, in most local non-

African owned companies an almost clannish tendency exists to hire expatriates or non-African Kenyans for the very top positions. These are problems that need recognition, calm discussion and gradual remedies. A determined, though cautious and not overzealous or disruptive approach is warranted.

OPTIONS FOR REFORM

Trade Policies

- Though obviously needed, certain reforms to ensure positive effective rates of protection and export promotion require considerable technical analysis to justify changes in tariff schedules. The government should continue striving to rectify such abnormalities. But some urgent changes are warranted to boost technologically strategic industries such as mechanical engineering, foundries, and refractory brick manufacturing. To this end, tariffs on pig iron (20%), coke (30%), high carbon, alloy and stainless-steel plates (25%), and aluminium ores, concentrates and oxides (25-30%) should be eliminated together with their sales taxes. This would significantly improve the profitability of manufacturing hand tools, cutlery and machinery locally.
- The government should proceed cautiously in liberalizing imports. Before doing so for a specific product, it should be confident that the additional pressure on local producers will cause firms to become more efficient or assets to be purchased and re-applied productively by the more efficient firms in the industry. Wholesale collapse of an industry leaving lots of idle machinery and workers would not benefit the nation unless the industry just has no chance of ever becoming efficient.

Special Policies for the Vehicle Assembly Industry

Research should be immediately initiated to identify the best way to completely rationalize the vehicle assembly industry. Both the reduction in the number of makes and models and the economic benefits achievable from merging some or all of the vehicle assembly plants should be evaluated. Once an appropriate path for the development of this industry is ascertained, the government will need to be unequivocally determined to implement the rationalization and restructuring programmes.

Procurement

The government should perceive and use its purchases better to help new local industries to get started and later to enhance technological abilities. Many tender board members should have industrial experience and be able to recognize when the volumes being purchased should warrant encouraging local firms to initiate production. The government should also re-evaluate the items being tendered for at the district level. If significant economies of scale exist for an item, then the government should consider having it tendered centrally.

Appropriate Technology

- A national campaign should be initiated to encourage the use of tiles rather than galvanized steel roofing. The sales tax on tiles should be removed.
- The feasibility of using animal-drawn carts within the first 10km zone around the sugar factories should be seriously investigated as a way to save foreign exchange and promote small rural enterprises through the multiplier effects of the incomes generated. That money now leaks out of the country to pay for imported tractors, petrol and spare parts.

Controlling Excess Capacity and Steering Investment into New Activities

Financial Policies

- The big investment banks, together with Kenya Industrial Estates and the Ministries of Planning, Commerce, and Industry should, identify the priority areas for industrial investment. The government should then encourage the major development banks to revise their perception of their task. They must be more active, aggressively identifying feasible projects and linking entrepreneurs with the requisite abilities. Moreover, the development banks should strive to broaden current industrial activities or steer funds into manufacturing industries that are underdeveloped or non-existent. The development banks should thoroughly coordinate their investments to avoid redundant investments and ensure systematic channelling of funds into priority areas (Ikiara 1986: 26). The goal should be to increase the nation's technological capabilities and create additional complementarities and linkages within manufacturing and between it and agriculture.
- Since commercial banks, insurance companies, and pension schemes invest so little in manufacturing, they should be

required to invest a fixed percentage in the major development banks (Ikiara 1986).

- The government should initiate a small programme of highly subsidized loans (say, at 4-5% p.a.) for investments in high precision mechanical engineering and foundry equipment linked to the anticipated production of specific products. The programme could be administered by the Kenya Commercial Bank.

Tax Levers

The Ministry of Planning should take a diplomatic but stern look at those few, but large, manufacturing firms which refrain from creating capacities to manufacture items or materials locally merely because the mother company has excess capacity abroad. In these cases the national interests are in direct conflict with the global incentives of the MNCs. The companies should be quietly persuaded that at long last it is time to invest. If they still decline, then the government should consider simultaneously applying positive and negative pressures to gain compliance, e.g., offers of temporary tax relief for new investment, and suggestions of tax audits, especially to look for past tax evasion through transfer pricing.

Regulation

The Minister of Economic Planning and National Development should have the mandate and authority to intervene and veto an allocation of foreign exchange for imported capital equipment for a project if significant underuse of industrial capacity would result. This would be an exceptional power; the Minister would usually not be involved in approving foreign exchange allocations for capital equipment.

Research and Development

- The government should grant an additional 100% tax break for R & D expenditures.
- The formation of a few private R & D foundations to fund technology and production-related research should be encouraged.¹⁴

Patent Legislation

- Kenya should modify its law to exclude patent rights for spare parts for use by Kenyan industries and for industrial products and processes Kenya would like to develop (e.g., motors, agricultural equipment, electrical goods). This would be a nationalist, not a radical measure. For instance, when Italy wanted to develop its chemical industry it exempted chemicals from patent protection and later, after the industry was large, reimposed patent coverage. The Andean group also excludes drugs, beverages and food; India excludes drugs, other chemicals and foods; Mexico excludes alloys, chemicals, fertilizers, pesticides, herbicides, fungicides and their manufacturing processes, and computer programs (UNCTAD 1981).
- The Kenyan law should oblige a patent holder to produce satisfactory quantities locally within 3 years of getting a patent on an item. Otherwise, the patent would be withdrawn.
- Kenyan citizens should have the right to obtain a short-term utility certificate for product innovations and improvements that are useful but not so fundamental as to warrant a patent.

Policies toward Royalties, Licences and Trade Marks

The staffing for the Central Bank's department that evaluates technology transfer agreements should be significantly strengthened. Normally, it should not permit agreements to impose import or export restrictions on licensees. The government should draft and publish regulations for technology transfer agreements.

Getting More out of Foreign Aid

The External Aid Department should employ more well qualified negotiators and place economists on its staff. The latter's job would be to become closely familiar with Kenya's industrial capabilities. By knowing this, the Department could negotiate systematically for increased local content in aid packages.

Indigenization

All companies, including multinational corporations, should be required to advertise locally all positions including top management posts. Increasingly, senior posts--especially managing director, financial controller, production manager and chief engineer--should be awarded to competent Kenyans. Given the frequent practice of frustrating local assistant

managers until they resign and thus leave a top management post uncontested for an expatriate, an appeals committee specifically for such management cases should be established in the Immigration Department.

CONCLUSIONS

A effective policy to hasten Kenya's technological development requires a clear vision of the magnitude of the transformations desired and confidence that they can be done. That vision must permeate and inspire the governmental and private organizations involved. Without that vision, the policies, however coherent on paper, will become incoherent in their implementation.

A viable technology policy will not be simply a statement of intent but a major mobilization programme to bring the private sector, research bodies, the government and the public into new forms of institutional arrangements aimed at achieving long-term development goals. The process will require some flexibility and experimentation (Juma 1986: 19).

A policy to accelerate the development of local technological capabilities will also meet opposition. Significant vested interests have built up, and now, in their short sighted striving, block or hamper industrial and technological advance. Therefore, vision to become real needs political will.

Endnotes

* The author is grateful to Dr Calestous Juma of the African Centre for Technology Studies, Nairobi, for many useful suggestions and insights.

1. Studying 20 MNC subsidiaries in Kenya, Gershenberg (1983: 21) reported, "In no case did we find firms undertaking to assist in the development of local suppliers." He concluded, "The Government of Kenya does little to actively encourage the use of local resources in production and thus to maximize local value added in the manufacturing/processing sector" (p.23).

2. These attacks from within and outside parliament appeared increasingly prominent in the newspapers during 1987 and 1988, e.g., concerning refined sugar, textiles, confectioneries, ceramics, and jute bags.

3. During times of foreign-exchange and import restrictions, KIRDI, as its predecessor, encounters heightened demand by manufacturers for its research and development services. The pressures stimulate manufacturers to search for local solutions.

4. The following sections on technology policy, patents, appropriate technology, makes and models, and trade policy draw heavily from Coughlin (1987).

5. "The glass industry illustrates the high costs of a failure to enforce standards strictly. The short-sighted and unco-operative attitude of the local bottle monopolist cost itself and the Kenyan economy dearly. The quality of the bottles produced by Kenya Glass Ltd. could have been improved for a fraction of Kenya Breweries' investment in its new plant. Instead, Kenya Glass lost a large share of its market, and Kenya was committed to use KSh 169 million in foreign exchange to build redundant facilities. So, while one factory was shutting in Nairobi for lack of orders, the Breweries building a new one! In 1984, the industry was using about 65% of its capacity and in 1985, 48%. If needed, an expansion of 19,000 tonnes per annum in capacity could have been made for an investment of KSh 16 million in the existing Mombasa plant. Viewed from the nation's perspective, unneeded investments of roughly KSh 300 million are occurring, and the industry's capacity utilization will shrink to 35-40% in 1987. Moreover, instead of achieving economies of scale, some factories will incur diseconomies of low-volume outputs. Yet the damage could have been prevented. If the Kenya Bureau of Standards had slapped big fines on the local monopolist whenever low-quality bottles were produced, the company would have had to improve its quality or sell out to someone -- probably the Breweries -- who would improve the quality" (Coughlin 1986d: 8-9).

6. "There was no local search in Kenya to establish the potential contribution of the industry to the [Kisumu power-alcohol] project [although] the Kenyan metal fabrication sector is well developed and has supplied engineering equipment to the Eastern African countries" (Juma 1986: 8).

7. Opportunities exist to better use present capacities or to invest in further import substitution industries to produce: turpentine and rosins processed from pine sap; caustic soda; various components; tools; flat glass; pharmaceutical active ingredients; ceramics; industrial acids; recycled oil and plastic raw materials; natural rubber; virgin plastic raw materials; small motors, compressors, and pumps; roofing substitutes for galvanized corrugated steel sheets; and jute replacements.

Decreased tractorization and increased use of rail transport would also cut the foreign exchange costs of transport. Investment is also much needed in high precision foundry and machining capacity.

8. This was being considered seriously from 1978-1981. Fortunately, the project was not initiated. The feasibility study's projected demand levels for steel later proved three to four times too optimistic (Coughlin 1985a: 101).

9. Owino (1988:11) reported:

In 1981, the Kenya government changed its decision to buy amoxicillin trihydrate from a cheaper source to a high cost supplier because of the patent laws. A local company won a tender for the supply of capsules of amoxicillin trihydrate at a quotation of KSh 395 per 1,000 capsules. Later, a MNC patent holder, claimed it had a patent in Kenya and deserved monopoly rights over the product. Even though the local company confirmed by a letter that the product was not registered by the Registrar of Patents and trademarks in Kenya, the MNC was awarded the tender. The government had to buy the amoxicillin trihydrate under the brand name Amoxil from an agent of the MNC patent holder. The product was bought at KSh 1,074 per 1,000 capsules. In total, the government could have saved about KSh 3 million had it bought the product from the local company.

10. This discussion of utility certificates relies extensively on Juma (1987: 20-21).

11. For example, Kenya imports 116 makes and more than 260 models of water pumps (Begumisa 1982: 63-64)

12. The Industrial Research Project of the University of Nairobi, with the assistance of the International Development Research Centre, is launching an international study of the impact of deletion allowances and feasible tactics for improving them.

13. In a study of 15 large manufacturing firms in Kenya, Ebangit (1985: App. Table 4) found that just 20% of the positions for managing director (or general manager), financial director, and production manager were held by Kenyans.

14. The efforts during 1987 by Pres. Moi to raise funds for research, illustrate the feasibility of this proposal.

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