THE FORMULATION OF AN INDUSTRIAL STRATEGY FOR TANZANIA

By

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INTRODUCTION: SOME THEORITICAL CONTROVERSIES CONSIDERED

Any strategy – global or sectoral – must be related in a *fundamental* way to the goals of society. It must seek to embody society's conception of the development process.

Tanzania has already defined her development strategy. The Arusha declaration and the Mwongozo perceive the development process as pivoted around *man* – his growth, his health, his security, his dignity and therefore his overall well-being *(1)*. It is built around the pillars of self-reliance and socialism. As such, development is seen not only as a process of accumulation, i.e. of augmenting the output capability of Tanzanian economy but also as a transformation of the institutional structure of our society. Tanzania's development therefore requires the introduction of activities that are *basic needs oriented* (food, habitat, health, education, communication and transport) *(2)*, favouring indigenous and innovative processes which take into cognisance environmental potentials and limits.

This strategy has been conceived in the light of the analysis of Tanzania's post-colonial society which is characterized by underdevelopment *(3)*. On the one hand, the economy which we have inherited is a *dependent* one and its structure is therefore deformed. It is unable to generate self-sustaining development and to create an economic system that displays a reasonable symmetry between the structure of production and the structure of consumption. On the other hand, attempts at modernizing it (often confused with transformation) have proved abortive as the industrialization pattern which has been carried out (the so-called *(4)* import substituting industrialization strategy – ISI) appear to have implied merely an adoption of more sophisticated patterns of consumption (both private and public) *without* the corresponding process of capital accumulation and technical progress. In effect, the techniques embodied in the equipment imported were not related to the level of capital accumulated but to the demand profile of the modernized sector of the society. It is this particular orientation of technical progress and its lack of organic connection with the level of capital previously accumulated that gives the specific character to underdevelopment in relation to the formulation of an industrial strategy *(5)*.

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The economic rationale of the ISI strategy was, of course, the theory of general economic equilibrium à la Walras. If all activities are equally important then it does not matter how they are sequenced, provided they are justified by a specified rate of return. It will be argued that the theory ignores, by implication, the fact that the productive structure of an industrial economy consists, of necessity, of a category of industries which are *basic* in the Sraffa sense, i.e. industries whose outputs are used either directly or indirectly in the production of *all* other outputs in the economic system *(6)*.

Moreover, as has been observed, the process of transplanting consumption patterns, generated by the system of international division of labour imposed by the countries leading the process of industrialization, has given rise to economic systems such as that of Tanzania where technical progress is first assimilated at the level of the demand for consumption goods. As such these economies *may continue to be dependent even in the absence of foreign direct investment (7)*. Nationalization of the major means of production does not, therefore, signal an end to dependence in this context.

The conclusion to be drawn from the foregoing is that ISI as was relied upon in the past plans *permanently reinforces dependence* and is incompatible with Tanzania's development strategy. This is because the introduction of new products or processes from the centre will *always* require more sophisticated techniques and higher levels of accumulation than can be sustained by Tanzania type economies *(8)*.

Perhaps if we turn our attention to the rudiments of the nature of a productive process we may be able to delineate the elements of an industrial strategy that is consistent with Tanzania's objectives – self-reliance and orientation towards basic human needs.

To begin with, we may note that productive processes (i.e. flows) of an economic character are essentially *continuous* over time. This is especially true of industrial systems. Such continuity is, however, assured *only* if the necessary stock of resources are themselves continually replenished to make up for the wear and tear which production involves. On the one hand, the level of such production processes is determined by the time utilization profile of these stocks which is greatly enhanced by the principle of division of labour and specialization. Obviously such utilization assumes sufficient effective demand, freedom to start production processes at any time and flexibility of the social order to vary the working day appropriately *(9)*. It also assumes that appropriate stocks are available and replenishable in the physical as well as the financial sense *(10)*.

On the other hand, the manner of such replenishment differs significantly for the different stocks (labour, natural resources and capital) as does its effect on the configuration of the production flow. Thus labour supply is largely determined by non-economic factors, the Malthusian doctrine notwithstanding, and natural resources are ultimately determined by external natural factors. This is, however, not the case with stocks of produced fixed and working capital. For these become available in the *form of outputs of the production flow itself* and therefore affect its structure considerably.

It may be useful to recapitulate the significance of the above argument. Let us assume that our major food is bread. This sustains labour power, a basic commodity and is *ex-definitione (11)* also basic. Assume further that this bread is continually being produced through the replenishment of stocks of cereal seeds, labour and equipment goods. These latter are required *both* in the production of the raw materials (e.g. ploughs, machines for producing seeds, fertilizers, insecticides, etc.) *and* for producing the final consumer goods (flour mills, baking ovens, etc.). While labour and raw materials can for our present purpose be taken as data, *the equipment goods must themselves be continually reproduced* in order to replenish them as they wear off over time. In other words, another production flow must be established so as to maintain the production of additional cereal and bread.

It will be apparent by simple inspection that the second production flow, i.e. the flow of equipment goods involves us in an infinite regression. This is because the equipment goods mentioned above, viz. ploughs, machines for producing seed wheat, fertilizers, etc., must themselves be produced by means of other equipment goods, e.g. extractive machinery, steel mills, etc. These must also be produced by still other equipment goods and so on... *ad infinitum...* . And yet this chain of the apparent infinite regression appears to be broken by industrial economies as production continually flows ! In the case of Tanzania a partial solution is, of course, *continuous* importation *(12)*.

As Adolphe Lowe has suggested, the theoretical solution to this puzzle is the existence of a group of industrial activities in the field of equipment goods *capable both of producing other equipment goods and also of reproducing themselves (13)*. These are the engineering industries which are the progenitors of *all* other machinery and also of themselves. In other words, for the physical maintenance of an industrial regime of production (and by implication of a *growing* agriculture/livestock economy) *(14)* engineering industries play the same strategic role as seed for cereal grains plays in agriculture and the reproductive system plays in the maintenance of organic life.

Thus in sum our search for an industrial strategy for Tanzania-type economies leads us to the conclusion that a necessary though not sufficient condition for autonomous industrialization is the establishment of engineering industries. For these are the only activities that embody technical progress and which can, therefore, sustain industrialization on a sequential basis.

THE CONTENT AND MEANING OF THE PROPOSED STRATEGY

Although much has been written on the «need» for an industrial strategy for Tanzania-type economies, there has hardly been any meaningful discussion of the content of such a strategy *(15)*. In my view, an industrial strategy must be defined by at least *four* elements. First it must identify a list of *industrial activities* (appropriately disaggregated) that must be undertaken, together with a rationale for their selection. Secondly, within the activities chosen, an industrial strategy must specify the criteria for *choice of techniques*. Thirdly, it must specify the *institutions* and *organizational* framework in which such a strategy must be undertaken. And finally an industrial strategy must include an algorithm of *sequencing* the various activities

over the entire planning horizon. Needless to mention that the choice of an appropriate planning time horizon is a political one implying definite relations between aggregate consumption and aggregate investment. Let us examine these aspects seriatum.

CHOICE OF APPROPRIATE ACTIVITIES

To begin with the choice of a set of industrial activities to be included in an industrial strategy depends upon our conception of the development process. For those who perceive development as an accumulation process, industrial activities are delineated by maximizing industrial growth. With limited resources, i.e. with a specified budget constraint, a ranking of industrial opportunities is undertaken using social cost benefit criteria. Only those activities which show relatively high rates of return up to the point the budget constraint become binding are selected as appropriate activities in the strategy. If, however, development is also seen as a transformation of the institutional structure of society, the flaw of the above criterion becomes evident. For the above procedure is valid only in non-dependent economies, where the production structure is not greatly constrained by the replenishment of physical capital. In such economies the core of production, i.e. basic goods, have already been established. But in underdeveloped economies such a structure does not exist. It has to be established. The criterion for choice of activities in the context of Tanzanian-type economies, therefore, takes its point of departure from consideration of establishing basic goods production.

Of course, a necessary precondition for this delineation given our development goal is *knowledge of our existing resources* (natural as well as human). Although natural resources are generated by the combination of some natural object with science and technology – there being no natural resource in an absolute sense – this precondition in Tanzania is fulfilled only to a very limited extent. Our mineral surveys and explorations are woefully incomplete. It is only recently that an inventory of our animal, fishery and forest resources is being undertaken. Even in the agricultural sector, soil surveys have been undertaken only in a few areas. *One major recommendation of the industrial strategy is therefore that sufficient resources must be channelled in completing the country's inventory of exploitable resources.*

Given the resources of the economy as are presently known and our budget constraint, the industrial strategy based on the above premises in the next five years should concentrate on: engineering industries (metal working), chemical industries, food industries, textiles, non-metallic mineral produce industries and paper industries. It remains to justify the choice of the above set of activities in the light of the above discussion. To begin with the selection procedure must be guided by Tanzania's basic needs at the present conjuncture (food, habitat, health, education, communication and transport) and the available known resources. The satisfaction of the basic needs requires at least in an indirect way most of the above activities *appropriately defined.* The output of engineering industries is required in the production of machinery which is subsequently used in the reproduction of *all* our basic needs.

Consider food for example. Tanzania's food consists essentially of cereal grains, root crops, bananas, meat, fish, vegetables and fruits. The reproduction of each of these foods on a marketable level requires use of machines: agricultural implements, machinery to produce fertilizers, seeds, insecticides, fishnets, slaughter house, etc... The same is true of housing where machinery is involved in basic construction and furniture making. Health, education and communication also use machinery both in construction and in the provision of such basic inputs as hospital-ware, books, communication equipment, transport equipment, etc... It is only pertinent to mention here that a remarkable feature of engineering industries is the similarity of the processes they perform. Furthermore, engineering industries are recommended for introduction now since they anticipate the iron and steel industry to be firmly established in the next plan.

Wood industries, apart from their use in construction (a capital-augmenting activity) and furniture making, act as import substitutes and/or complements to the engineering industry *(16).* The importance of food industries, textiles and non-metals need no further justification. However, there are a number of important interrelations. The processing of cotton seed yields edible oils. Chemical industries have extremely high linkages in an industrial system and are used in the production of basic goods in various ways: e.g. pharmaceuticals, fertilizers, preservatives, paints,etc... The basic problem here is the locus of a chemical industry. It is suggested that the natural gas at Songo Songo and Kilwa Salt may form a useful starting point of a chemical complex. The paper industry is recommended not only to meet our education and communication objective *(17)* but also to anticipate world demand and thus broaden the export base as we have an adequate resource base.

It is necessary to disaggregate the above industrial categories into specific activities in order to observe the sense of the proposed strategy. This is because the same activities can be used to generate non-basic goods. But it is this flexibility in their utilization which must be seen as a positive factor for their development. *When linked vectorally,* the above activities, appropriately disaggregated, form the core of the basic industrial strategy. No doubt some of these activities will require «import substitution» in the sense that outputs of these activities will be produced domestically rather than continually being imported. But the raison d'être for their import substitution will be conformity with the basic industrial strategy. They will not be import substituted only because they were previously imported and the level of imports has attained a threshold. In the same way some of the activities in the basic industrial strategy may be exported. But their exportation will be an extension of the domestic market. The strategy is therefore *not* biased against export industries. It is not an autarkist strategy. Moreover, a basic industrial strategy is directed towards a more optimal use of domestic resources and is particularly geared in our circumstances to enhance the agricultural sector. Of course, some of our resources were developed for maintaining lopsided development. However, even for such resources, some further uses to integrate the economy while allowing for exports can and indeed must be found. This is, for example, the case with cotton as pointed out above. Whereas we used to export all our raw cotton (lint as well as seed)

while importing cotton textiles and edible oils, now cotton seed is our major source of cooking oil and related products, products which also have a large potential export market. The same is true of cotton textiles. In the case of the sisal and cachewnut industry new uses to integrate our economy while providing export opportunities are presently being investigated.

CHOICE OF TECHNIQUES

A second element of an industrial strategy relates to choice of technique of the activities so delineated. Unfortunately, the received literature has defined choice of technique more by its probable impact on the environment or on the use of natural resources than by its adequacy to the real socio-economic conditions and priorities of the recipient human group. When choice of technique has been formulated in terms of capital-labour relations, the discussion has not always distinguished the nature of «capital» under reference. Capital is normally assumed to be a homogeneous factor, expressed in money terms and disembodied from the labour that was required to produce it. On this basis neoclassical analysis concluded that the appropriate technologies for underdeveloped countries must be labour-intensive. The economic rationale was that since static efficiency requires the equilibrium of marginal rates of factor substitution with the (implicit) wage-rental ratios, and to the extent that wage-rental ratios were assumed to be low in the underdeveloped countries, more labour-intensive techniques has to be adopted *(18)*. However, even casual observation revealed that the techniques adopted by the underdeveloped countries tended to be more capital-intensive. Consequently a number of «arguments» were presented to explain the contrast between theoretical expectation and reality.

One view invokes completely rigid technology in the face of which differences in relative factor prices would be irrelevant *(19)*. Another view holds that factor prices are unduly distorted in underdeveloped countries. Among the reasons adduced in support of this are overvalued exchange rates, generous investment allowances and other policy pressures which artificially reduce the price of capital. Furthermore it is claimed that minimum wage legislation and pressures resulting from the establishment and growth of labour unions distort factor price ratios in favour of capital relative to labour. Still another view contends that the underdeveloped countries must expect to get factor inappropriate techniques insofar as their factor endowments are different from the developed countries and they fail to establish their own capital goods industries.

Despite the research that has been undertaken on this question it has not been possible to test the above hypotheses satisfactorily because meaningful testing is inordinately demanding in its data requirements. Full information would include specification of factor proportions of all known technologies at different levels of output, market sizes in all relevant countries, the technical possibilities of factor substitution in all relevant industries – as they have been, as they are and as they are expected to be. Obviously most of this data is unavailable. Nevertheless it is useful to examine the above arguments in greater detail in order to at least take stock of our existing body of knowledge on the subject before we proceed.

In the first instance it is reasonable to claim that despite the differences in factor endowments, technological rigidity *is not a sufficient explanation for inappropriate technological choices for the underdeveloped countries.* This is for a number of reasons. To begin with, *even* if one held a fixed coefficients view of production functions within each industry, one would still expect the underdeveloped countries to concentrate on those activities which call for much labour and little capital. Secondly, there is sufficient evidence to indicate that within some industries at least considerable choice among technically efficient alternatives is possible *(20).*

If technology is generally flexible and the opportunity costs of labour and capital differ significantly between the developed and underdeveloped countries (à la Emmanuel Arghiri) *(21),* then the similarity of production techniques may be explained by deviations in the underdeveloped countries of actual factor prices from their true opportunity cost and/or by a failure on the part of decision takers to give full weight to prices in the factor markets. There is no doubt that factor prices deviate from their true opportunity costs. Nor can it be denied that the policies of underdeveloped countries have the effect of cheapening artificially the price of capital relative to labour. However, it cannot be asserted that factor price distortions are the *cause* of inappropriate technology choice unless it is established that decision takers are sensitive to variations in factor prices.

A number of attempts have been made to estimate the elasticity of capital-labour substitution for developing countries and the results from four relevant studies are shown in Table I. With the exception of the time series estimates for Argentina, the figures shown are all impressively high indicating a reasonable sensitivity to factor price changes. If these are generally representative of underdeveloped countries' industry they would tend to offer strong support for those who believe that the deviations between the actual and true factor prices is the major cause of the disappointingly poor rate of growth of the industrial alabour force in developing countries.

TABLE I

Elasticity of Capital – Labour Substitution in Developing Countries

Author	Country/Countries	Elasticity
Reyaolds and Gregory	Puerto Rico	1.0
Brikkson	Argentina, Brazil, Colombia Costa Rica, Mexico	0.7
Harris and Todaro	Kenya	0.8
Katz	Argentina	1.0 a 0.3 b

Source: C. St. J. O'Herlihy, «Capital Labour Substitution and the Developing Countries», *Oxford Bulletin of Statistics,* P.273, Vol. 34 No.3, August 1972.

Notes: a – «cross section».
b -- «time series».

Yet a number of studies do suggest that extra economic considerations, e.g. risk avoidance, appeal to «modernity», established procedures and familiar techniques explain the existence of inappropriate technology in the underdeveloped countries *(22)*. It has been suggested that the basis of such decisions is the pattern of ownership and control.

It should also be noted that there is another school of thought, again based on neoclassical assumptions which arrives at a contrary conclusion, namely that the underdeveloped countries should use more capital-intensive techniques. The argument is based on the choice of techniques' influence on income distribution and the size of the investible surplus, and hence its effect on growth of income and employment. More specifically, it is argued that since capital intensive techniques imply a smaller share of wages in output, they will yield a larger investible surplus and a faster rate of growth of employment *(23)*.

Thus the problem of choice of techniques in the context of a development strategy of accumulation does not yield unambiguous criteria. It is reasonable to state also that it does not lead to useful policy options for the periphery. This is because the main object of choice is said to revolve around the question of whether technology should be transferred in a capital intensive form which corresponds to advanced technologies in the highly industrialized countries, in a labour intensive form which in the advanced countries is archaic and in the underdeveloped countries not available, or in some variant of intermediate technology which treads the golden mean uncommitment. But it should be obvious that these niceties of efficient resource allocation are meaningless if they are not placed in the framework of *dependent* economies. For in this context the key question is *not* the level of capital intensity at which a process is introduced, but its ***adaptability as a carrier of self-generating institutional and technological change.*** The choice therefore takes its place not from capital – labour relations as such but from the level of technical sophistication that can be institutionally supported and that will act as a catalyst for further institutional diversification and integration. The relevant issues for consideration under choice of techniques in Tanzania type economies can thus be briefly summarized. ***First,*** does the technology to be introduced stimulate new skills, new capabilities, new organization? In other words, does it contribute to institutional building? ***Secondly,*** does it lead towards technological autonomy or a perpetuation of dependency, especially on mother companies in foreign countries? ***Thirdly,*** does it contribute towards technological integration? ***Fourthly,*** is it compatible with reasonable resource management at national level? ***Fifthly,*** does it help to tie together universities and research institutes with producing enterprises?

I submit that the above are the considerations that have a direct bearing on the question of technological autonomy versus dependency which determines the destiny of a country within the broader world political economic system. They include an examination of institutional differentiation and integration at the macrosocial level as well as the relationships of world technological, economic and political power centres.

Several implications can be drawn from the above analysis. One is that choice of techniques cannot be made independently of the choice of activities that must be undertaken in order to transform the economies of the underdeveloped countries. For technologies are invariably embodied in capital goods. There is often moreover, a close relationship between technology producers and users which facilitate the flow of knowledge between them thus enchancing the embodiment of technical progress in capital goods. Secondly, a level of technology which takes off from what the institutional supporting structure of the country is capable of handling in its present stage will in all probability lead to genuine local autonomy in sophisticated production methods within a *shorter* period of time than one that starts too high and for that reason remains static *(24)*.

I must be emphasized that the present parastatal system appears to thwart the effects of the above described technological choice. This is because the «successful» parastatal is one which manages to establish a project on the ground. The management of such a parastatal therefore tend to support projects that are «turnkey», i.e. projects that perpetuate dependency. A necessary implication of the above analysis is that parastatal performance will have to be evaluated with this new view of choice of techniques in mind.

Finally we are now in a position to dispose of some of the policy issues conventional wisdom relates to choice of techniques. Firstly, small scale enterprises, though not necessarily labour intensive are an important carrier of transfer of technology. The Japanese parent subcontract system and the subordinate affiliation system suggest how this can be achieved *(25)*. Secondly, the employment and dispersion effects of technological choice may sometimes be subordinated to choice of activities.

INSTITUTIONAL FRAMEWORK

A third element of an industrial strategy is the specification of institutions and organizational framework in which such a strategy must be undertaken. The key institution accompanying the industrial strategy recommended must be concerned with the formulation and implementation of *technology policy*. As will be recalled, technological progress is expressed through the improvements in the production of existing goods and services or through the creation of new goods and services. Technology policy must therefore be aimed at providing the entreprises with the necessary capacity to understand better the principles of technology they are using to master its application and introduce modifications which make it more suitable for their specific operating condition.

In view of what has been said in the preceeding pages, it will be readily apparent that the aims of technology policy must be the following:

a) Creation of an indigenous technological capacity, especially one aimed at producing basic goods;

b) Regulation of the process of importation of foreign technology thus reinforcing the bargaining power of technology buyers by developing the capacity to identify, select and incorporate technology;

c) Promotion of the interconnections between indigenous technological activities and productive processes;

d) Increasing the technological absorption capacity by disaggregating the technology package and developing a capacity for engineering design and consultancy; and

e) Fostering the demand for local technology *(26).*

These aims of technology policy must be incorporated into appropriate policy instruments that would orient technological behaviour. The need for specifying policy instruments cannot be overemphasized. Despite the fact that Tanzania's industrial sector is largely in public hands, we have not as a nation acquired even minimal technological capacity in most industries. Even in a sector such as textiles, where we have over fifteen years experience and a holding parastatal, we still commission outside consultancies to carry out preinvestment studies, order machinery and equipment, instal plants and often carry out maintenance.

There are at least *two* policy instruments which must be considered for immediate adoption. First is the *disaggregation* of the technology package to be incorporated into the productive processes. Disaggregation is recommended because it leads to a better identification of the components of technical knowledge and their degree of complexity; allowing the enterprise to master the technology it imports. The disaggregation often occurs at two levels. First is the separation of the investment projects into each of its components (e.g. civil works installations, machinery and equipment, technical personnel, licenses, etc.), and secondly a technical disaggregation as such where each of the package components is examined from the engineering point of view between those components which are specific and inherent to the design and those that are generally common to different processes or products. Disaggregation can serve different aims of technology policy. It strengthens the bargaining power of buyers and helps to regulate the imports of technology. It allows the identification of those components of imported technology which could be produced locally, thus generating a demand for technological activities and it also permits users to have a greater understanding of the characteristics of imported technology, thus facilitating its adoption.

Certainly the process of disaggregation cannot take place in vacuo. It requires an institutional framework. The firm establishment of Tanzania Industrial Studies and Consultancy Organization (TISCO) for carrying out preinvestment studies, and offering various technical consultancies for industry will be a major step in implementing our technology policy. To be effective, it must not only be competently staffed from the very beginning but it must be in a position to deal with the entire project cycle. It must be able to examine the projects with a view to identifying alternative inputs, processes, designs and outputs. It must also establish an information system that will orient the demand for technology towards local sources, and assist in the training of professionals for the genration of technology. Another important institution that must be created is the development of a capacity for *engineering design.* So far, most of our engineering graduates can cope with tinkering with existing designs but are generally ill-equipped to transform them or to create new designs. The faculty of Engineering must seriously consider the establishment of an institute in engineering design.

A second policy instrument is the use of the leverage of financing institutions in influencing enterprises to use local technology and/or local raw materials. The use of this instrument requires the explicit incorporation of criteria related to technological development in the evaluation of requests for finance. These criteria should be extended to the implementation and project execution phase. The Tanzanian Investment Bank must design criteria to be applied to all requests for its financing that will ensure that the broad policies of indigenous technology development are implemented.

Turning now to the question of *industrial organization* it must be stated that it is contigent upon ownership and control. The major goal must be effective participation of workers in the enterprise. An elementary level of participation in which workers are fully informed about management thinking and workers' representatives express their views to management, who take these views into account in decision-making should be achieved in all firms. At another level workers could be given such facilities and amenities as to enable them to care and feel empathy with the destiny of the enterprise. A deeper involvement of the workers, empowering them to make decisions in certain areas can also be achieved provided it is selectively done. This is possible for example, in industries where a relatively high degree of personal skill is required and where that skill often leads to on-the-job decision-making in cooperation with management. In large integrated plants, workers participation may be initially limited. Of course, the ultimate form *(27)* of participation is ownership by the workers as in Yugoslavia. This can easily be achieved in small-scale industries initially and if required, must be planned for large industries as well.

SEQUENCING

The final element of an industrial strategy relates to sequencing. This requires balancing of three main factors. First basic needs of consumers must be met. In many cases this will also provide a basis for structural change but there may be conflicts of consumers choice. Secondly, there is likely to be a limit to the degree to which disruption of the economy can be tolerated. For obviously this strategy is not being proposed on a *tabula rasa.* While such activities as cashew processing and diamond cutting do not fit the essential aims of the strategy, they are an important element of the present economic structure. It may be necessary, especially in this difficult period of foreign exchange constraint, to continue and even expand some of these activities which will not, in the long run be given an important place in the industrial structure. Thirdly, there are numerous technical considerations which play a part in determining the sequence in which the selected industries can be developed. For example, although the iron and steel industry to be developed on the basis of Tanzanian ore and coal resources is to be developed in the next plan period (1981–1986), it will be essential to develop user industries (i.e. forward linkages) in engineering and metals transformation now, to provide a base for the efficient production of steel.

SOME CONCLUDING REMARKS

Modern economic growth, i.e. long-term rise in capacity to supply increasingly diverse economic goods to a country's population, this growing capacity based on advancing technology and the institutional and ideological adjustment that it demands has been enormously facilitated by greater division of labour and specialization of tasks. This has in turn been characterized by the development of a hierarchical structure between labour and management and between the various layers of labour as well as that of management. It has also been characterized by uneven development and fetishicm of commodities and has consequently ignored the mobilization of ***human*** resources.

Tanzania seeks a different development strategy. As pointed out the goals of the Tanzanian society embrace the concept of self-reliance at all levels of the development process. On the decision-making level this implies a will to build up and use a capacity for autonomous decision-making and its implementation at all levels of the development process. And, on the production level, self-reliance requires the development of an indigenous capacity to generate and put into use these elements of technical knowledge which an autonomous decision-making process has selected for indigenous supply. It is within this framework that an appropriate industrial strategy – such as that suggested here – can implemented.

NOTES

(1) J.K. Nyerere, *Freedom and Socialism* (Nairobi and London: Oxford University Press, 1968) and J.K. Nyerere, *Freedom and Development* (Dar-es-Salaam, Oxford University Press, 1973).

(2) For a fuller discussion, see *What Now? Another Development* (Dag Hammars-Kjold Foundation, Uppsala, 1975), *Employment Growth and Basic Needs* (International Labour Organization, Geneva, 1976) and R.H. Green, «Basic Human Needs, Collective Self-Reliance and Development Strategy» in *Self-Reliance and Solidarity in the Quest for International Justice* (Ecumenical Centre-Bossey, Celigny, Switzerland, 1976).

(3) See J.K. Nyerere, *Ibid;* for a historical framework of Tanzania's development, see J.F. Rweyemamu, *Underdevelopment and Industrialization in Tanzania* (Nairobi, Oxford University Press, 1973).

(4) I say so-called because ISI does not provide any general principle upon which a country can apply when choosing its optimal activities.

(5) Celso Furtado, «Underdevelopment and Dependence: The Fundamental Connection», (University of Cambridge, Centre of Latin American Studies, Working Paper No. 17, 1973).

(6) Pierro Sraffa, *Production of Commodities by Means of Commodities,* (London: Cambridge University Press, 1960). Basic industries appear on the last row of a triangularized matrix of the combined current and capital input-output tables of a mature economy. See especially, Leontieff, W. and Ann Carter, «The position of Metal Working in the Structure of an Industrializing Economy», (Harvard Economic Research Project, August, 1966, mimeo) and Simpson and Tsukui, «The Fundamental Structure of Input-Output Tables; An International Comparison», *The Review of Economics and Statistics* (November 1965).

(7) The argument that direct foreign investment reinforces dependence is provided by J.F. Rweyemamu, *op. cit.*, chapter 3.

(8) The necessary level of capital accumulation might be obtained either through increased exploitation, i.e. increased concentration of income distribution or reducing consumption by taxation or state enterprise pricing to augment public sector investment, or through a more intense absorption of technical progress by the multinational branches. It will be apparent that these modes of increasing capital accumulation are at variance with Tanzania's development goals.

(9) For a succint analysis of this problem of minimizing «fund idleness» as he calls it, see the useful article of Nicholas Georgescu-Roegen, «The Economics of Production», *American Economic Review*, Vol. 60, 1970.

(10) This is another facet of the general equilibrium «illusion». All stocks are assumed to be exogenous (including capital stock), without any indication of the manner of their replenishment. While in a mature economy the replenishment of capital stock may be taken for granted, this is not the case in an underdeveloped one where the lack of indigenous physical capability of replenishing capital is precisely one of its distinguishing features. In this context, moreover, the so-called Cambridge controversy about capital is not much ado about nothing. For it is precisely this «physical» stock which cannot be aggregated to serve the purposes of neoclassical analysis.

(11) Bread is basic in Sraffa's sense because it enters (through being a wage good) into the production of all other goods. Any basic consumption good (wage good) is to some degree a basic good in the Sraffa system; any good vital to producing goods and services essential to meeting basic human needs is basic good to some basic human needs analysts (e.g. Green, *op. cit.*).

(12) Continuous importation is a «partial» solution in more than one sense as the results of such a production system does not enable the economy to «lead» technologically in any industrial sector. It enables the economy to produce only «mature commodities» in the sense of Hirsch. See especially S. Hirsch, *Location of Industry and International Competitiveness* (London: Oxford University Press, 1967).

(13) Adolphe Lowe, *On Economic Knowledge: Toward a Science of Political Economics* (New York: Harper Torchbooks, 1970).

(14) J.F. Rweyemamu, «A Neglected Relation Between Agriculture and Industry», paper presented to IDEP Conference, Tananarive, July 1975.

(15) A partial exception is the useful work of Clive Thomas, *Dependency and Transformation* (New York: Monthly Review Press, 1974).

(16) The substitutability of wood for iron in tool making especially in the agricultural sector is clearly illustrated by the success of «village technology». See the useful article of G. McPherson and D. Jackson, «Village Technology for Rural Development», *International Labour Review*, Vol. III, No. 2, February 1975 (Geneva), pp. 97–118

(17) Given the ambitions plans in primary and adult education, the paper requirement to sustain these programmes cannot be underestimated, even with appropriate substitutions of paper for slates, etc.

(18) D. Turnham and J. Yaeger, *The Employment Problem in Less Developed Countries: A Review* (OECD Development Centre, Paris, 1969). Werner Baer and Michael Herve, «Employment and Industrialization in Developing Countries», *Quarterly Journal of Economics,* Vol. LXX, No. 1 (February 1960), and Frances Stewart and Paul Streeten, «Conflicts Between Output and Employment Objectives in Developing Countries», *Oxford Economic Papers,* Vol. 23, No. 2 (July 1971).

(19) R.S. Eckaus, «The Factor Proportions Problem in Underdeveloped Areas», The The American Economic Review (September 1955).

(20) R. Hall Mason, *The Transfer of Technology and the Factor Proportions Problem: The Philippines and Mexico;* UNITAR Research Reports, No. 10, New York.

(21) Emmanuel Arghiri, *Unequal Exchange. A Study of the Imperialism of Trade* (New York: Monthly Review Press, 1972).

(22) Louis T. Wells, Jr. «Economic Man and Engineering Man: Choice of Technology in a Low Wage Country», Background Paper, Ford Foundation Seminar on Technology and Employment; New Delhi, March 21–24, 1973; John W. Thomas, «The Choice of Technology in Developing Countries; The Case of Irrigation Tuberwelles in Bangladesh», (mimeo).

(23) Walter Galenson and H. Leibenstein, «Investment Criteria, Productivity and Economic Development», *Quarterly Journal of Economics* (August 1955), *A.K. Sen, Choice of Techniques: An Aspect of the Theory of Planned Economic Development* (Oxford, Basic Blackwell, 1960). See G. Arrighi, «International Corporations, Labour Aristocracies and Economic Development in Tropical Africa» (University College, Dar-es-Salaam, 1967, mimeo).

(24) Technological development can therefore be taken as *sequential* and *cummulative.*

(25) See Masaru Saito, «Diffusion Mechanism of Technology and Industrial Transformation: Case of Small Scale Industries in Japan», OECD, Paris, 1973.

(26) See the useful paper of Francisco R. Sagasti, «A Framework for the Formulation and Implementation of Technology Policies: A Case Study of ITINTEC IN PERU» presented to the Interamerican Forum on Technological Development, Austin, Texas, February 24–27, 1975.

(27) This form is ultimate in two senses. It requires very great changes in production relations. Equally it requires more equal levels of productive forces (including capital) available to groups of workers if it is not to lead to sharp inequality along enterprise lines.

RESUME

J. F. RWEYEMAMU s'est penché dans son article sur les problèmes que pose la formulation d'une stratégie pour l'industrialisation de la Tanzanie. Cette stratégie doit, pour être efficace, être basée sur la Déclaration d'Arusha de 1967 qui a mis en relief l'importance des aspirations profondes de la société Tanzanienne et sa conception du processus de développement. Cette stratégie doit non seulement faciliter le processus d'accumulation du capital mais elle doit aussi et surtout opérer une transformation de la structure institutionnelle de la société Tanzanienne avec l'introduction d'activités axées sur les besoins essentiels et qui favorisent en même temps des processus indigènes et innovateurs. L'efficacité de toute formulation pour une industrialisation de la Tanzanie repose selon l'auteur sur la précision et l'exactitude des réponses apportées aux questions suivantes :

Quel contenu et quel sens donner à cette stratégie ?
Quelle technologie faut-il adopter ?
Quelle technique faut-il utiliser pour un meilleur rendement ?
Dans quel cadre institutionnel faut-il mener cette stratégie ?
Quels rapports faut-il établir entre ces différents éléments ?

Les réponses proposées par l'auteur sont les suivantes :

Dans le cadre du choix des activités industrielles à mener, il pense qu'il faut opter pour une stratégie qui repose essentiellement sur l'industrie mécanique, les industries chimiques, les industries alimentaires et les industries textiles, les industries de production de minerais non-métalliques et les industries du papier puisqu'il s'agit avant tout de satisfaire les besoins fondamentaux des Tanzaniens. Les techniques à utiliser dans ces activités doivent non seulement tenir compte du niveau de sophistification technique que l'institution en place peut supporter mais aussi jouer un rôle catalyseur dans le processus de diversification institutionnelle et d'intégration.

Après avoir rappelé l'importance d'une définition claire et précise de la politique technologique et de ses buts, l'auteur insiste sur le fait qu'en ce qui concerne la Tanzanie, cette politique doit être basée sur deux points essentiels : une politique de désagrégation du paquet technologique à incorporer dans les processus de production et une politique de «pilotage» des institutions financières qui permette d'inciter les entreprises à utiliser plus de technologie et de matières premières locales. Tout cela doit avoir lieu dans un cadre institutionnel qui garantit une participation effective des ouvriers dans la gestion des entreprises.

Quant aux rapports à établir entre les différents éléments, ils nécessitent un équilibre entre trois facteurs : la satisfaction des besoins fondamentaux des consommateurs, le degré de rupture à admettre par rapport à certaines activités qui existent déjà et quelques autres considérations techniques.

En conclusion, l'auteur fait remarquer que la stratégie choisie par la Tanzanie de baser son industrialisation sur l'auto-suffisance dans tous les domaines implique :

a) une volonté de construire et d'utiliser le pouvoir de prise de décision autonome
b) le développement d'une capacité indigène à créer pour les utilisateurs des éléments de connaissances technologiques.