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ECONOMIC COMMISSION FOR AFRICA

Working Group on the Review and
Appraisal of Policies, ^{the} ~~and~~ Programmes
and ~~the~~ Management Capacity of the
Economic Commission for Africa

Introductory Document to the Priority Area:
Enhancing the Dissemination and Applications of
Science and Technology

I. INTRODUCTION (background)

1. Africa is faced with a very grave economic and social crisis, one of the most serious consequences of which is widespread poverty and misery. It can be largely said that African societies cannot or do not know how to organize themselves in such a way as to always meet their essential needs, find ways and means improving their living environment and life style and adopt themselves to the tempo of the constantly changing world.

2. The continued impoverishment African peoples, misery, diseases and famine as well as the non-technological development are the most obvious characteristics of Africa's underdevelopment. To illustrate the latter factor, the use of rudimentary tools does not allow farmers to increase their production in order to meet the basic needs of an ever growing population. Similarly, the traditional iron works practised does not provide the farmer with tools that are more efficient than the hoe, the machet and the mattock. Also, while caravaners have successfully tamed the camel, the horse and the donkey, they have not been able to make a breakthrough in mechanical traction. Agricultural production has remained largely vulnerable to the vagaries of weather and all parasites and crop-destroying animals birds and insects. In most cases, irrigation is not practised even where there is abundant water and production is hardly beyond their subsistence stage. With regard to energy, firewood remains the major source for 90 per cent of Africans, even in oil-exporting countries. In fact, the technological agricultural base is very limited.

3. Paradoxically, Africa abounds in both renewable and non-renewable resources. Its handicrafts, industries and sectors and the tools used are also varied. All these provide the necessary technology development and innovation assets which can be used for economic and social development. However, the experience of other region - developed and developing alike - has shown that the position of such asset is not a sufficient condition for mastering the application of science and technology and to promote innovations.

4. It is a fact that the resources of Africa have been and are still very little used or not used at all in production activities. Thus, mineral and energy resources are only useful because other people need them for their economic activities. The only useful resource to Africa has long been land and the continent has remained agricultural, with more than 70 per cent of its labour force engaged in agriculture and living exclusively on it.

5. Africa, which has never been a closed continent not rather coveted by other peoples, was exposed to progress and innovations early. Unfortunately, the traditional African societies did not develop an educational system which goes beyond the transmission of the experience of their ancestors and the perpetuation of the skills and tools acquired, without setting up innovative structures. With the advent of colonialism, various structures including schools were placed alongside the traditions. Thus, in less than 50 years, a considerable number of Africans were trained in a very wide range of disciplines and to various levels. However, it should be mentioned that that has yet to lead to the mastery of technology for development.

6. Although right from the beginning, the colonial administration slanted education to evade science and technology, emphasis has somehow been shifted since the beginning of the 1960s. In order to meet the Africanization efforts in the area of science and technology and currently, all countries of the continent have national training and research structures. Also numerous opportunities been offered for training outside Africa and many African's work in foreign technological research and development structures.

7. Side by side with the educational system Africa has also adopted an administrative and economic organization system in the image of the developed countries, as a means of planning, directing and promoting economic and social development. For this reason, parallel to schools and universities, research and extension institutions have been established. Unfortunately, administrative and economic structures and research institutions alike have not acquired a solid base for developing, assimilating and disseminating technological factors required by African societies to master their economic and social development. The lack of operational links between the training, research and production structures have increased the technological backwardness of Africa in the productive sector. A painful fact about the situation is that there is low productivity in all the sectors of the economy and an increased dependence on the outside world. Also, it can be said that it is because Africa has remained technologically dependent on the outside world that it has also been dependent on such areas as food, current consumer goods, capital goods and social infrastructure development.

II. THE MAIN TECHNOLOGICAL AND INDUSTRIAL OPTIONS OF MEMBER STATES

8. The challenges are therefore considerable, especially in view of the ambition of African states to modernize themselves rapidly. Since the 1960s, the major technological options have been, first of all, the option that can be described as modernist and then the adoption of an appropriate technological concept.

A. The modernist option

9. The modernist option consisted in the crude transfer of technology without first considering its implications or developing a rational strategy and organizations that would allow for its adoption and integration in economic and social life of the average African. This option is reflected in:

(a) The elitist education;

(b) The superficial industrialization of which the "key-in-hand" factories are one of the characteristics; and

(c) An increased extrovert consumption pattern.

10. In spite of the considerable effort led by African countries, the educational system still remains the domain of the privileged. Those who have managed to escape the educational deprivation are, in most cases are confined to concepts and theory which are often remote from the major concerns of their societies. The educational system they have been exposed to does not relate to the problems of African

societies. On the whole, there is disregard to technical or vocational training, and those elites trained in science and technology have, for long, favoured rethorics rather than research and applications.

11. The result is that, Africa does not have, at this time it needs it, a great number of technicians and engineers to establish the basis of a scientific and technical culture. Thus, the ratio, by million, of engineers to inhabitants of Africa is only a third of Asia's and 3 per cent of Europe's.

12. The modernist option or gross importation was guided namely by the industrial process of Africa in the 1960s. In their laudable effort to diversify their production base, African states generally place emphasis on semi-manufacture of certain agricultural and mineral resources, agro-industry and import substitution industry for the other consumer goods. This industrialization process led to non-mastery of all the pre-production processes of raw materials and then the technical incapacity to maintain equipment owing to the lack of an induced technological culture. The result, without low productivity, is production units and underutilization of installed capacities. Dependence on the outside world for raw materials, spare parts and technical expertise also contributed significantly to the balance-of-payments deficits and therefore a major cause of the economic crises experienced by the continent. Hence, owing to lack of adequate resources, the modernist option which involved more financial capital than human resources did not yield the expected results.

13. The extrovert consumption pattern, particularly among the well-to-do urban dwellers has long been well known. But, the worst of all is that this is now a common phenomenon in all the social stratus of the societies because of the technological dependence of the continent on the outside world and its inability to develop a self-reliant technological base.