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Item II.1 of the provisional agenda*

PRACTICAL SECTORAL MEASURES FOR THE ACCELERATED ATTAINMENT OF THE
OBJECTIVES OF THE LAGOS PLAN OF ACTION AND FINAL ACT OF LAGOS

SCIENCE AND TECHNOLOGY DEVELOPMENT

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I. INTRODUCTION

1. Four years since the adoption of the Lagos Plan of Action, the basic picture in Africa today is still a simple one: whilst development (in the sense of the progressive realization in quality and quantity of potentialities of all kinds) is very slowly taking place, economic growth (that is increases in the physical output of goods and services to meet the needs of the mass of the people) appears to be not only slowing down but for various reasons, frozen in colonial and neo-colonial patterns and fail to reflect any sense of African self-awareness or sense of autonomous direction.
2. In 1980, African Heads of State and Government, meeting in Lagos, at a Special Summit of the Organization of African Unity recognized the fundamental importance of science and technology in promoting the economic and social development of their countries. They, therefore, formally adopted a Plan of Action to mobilize science and technology as vital instruments for the development of Africa. Within the framework of his plan, they assigned a specific role to the OAU, in co-operation with the ECA, to monitor the implementation of the Lagos Plan of Action. In this connection, the Secretariats of the OAU and ECA (in co-operation with all relevant organizations operating in Africa) at various times have developed programmes geared towards the strengthening of national technological capacities, increasing the awareness of the importance of science and technology in socio-economic development aspirations, evaluation of the impact of new and emerging technologies in the development aspiration of the continent and development of technologies suited to African conditions.
3. The limited socio-techno-economic programmes/projects embarked upon by African states in an attempt to attain the objectives of the Lagos Plan of Action are restricted mainly, to the urban areas. One characteristic common to almost all African countries is the dispersal of population - up to 80% of the population live in the rural areas, but it is to this part of the country that very little attention is paid in all socio-economic development activities. Self-reliant and self-sustained development as is called for in the Lagos Plan of Action, in reality, cannot be realised without adequate and proper integration of the rural population in the development process.
4. It is quite apparent that the actual potential of most African countries lies in the rural areas. The activities carried out or practiced in the rural areas are, however, termed 'informal'. To this end, thus constitutes the informal sector, whose economic activities are not classified in government statistics and whose skill requirements are not provided for in national manpower plans. One should also take into consideration informal education, i.e. that form of education which pertains to learning that goes on outside the formal provision of the Ministries of Education. These call attention to important activities in which a large proportion of the population, particularly those in the rural and suburban areas, are involved, which were, and are, still largely outside the main stream of economic activities in most African countries.

5. It is appreciated in the Lagos Plan of Action, and continentally, that the creative spirit of the people must be encouraged at all levels, which means that effort must be made to lessen progressively that gap between manual and intellectual work and the dichotomy between the rural and urban areas. This calls for the reckoning with our ancient national culture and active involvement and participation by the masses in the control of the productive process.

6. From the African point of view, therefore, the informal sector is the vehicle for the solving of the attendant problems associated with unemployment and under-employment and avert or retard the increasingly serious process of disintegration of rural life following out migration.

7. Another problem of vital importance in the accelerated attainment of the objectives of the Lagos Plan of Action is the lack of organized societies, organizations or associations - scientific, engineering and youth societies in Africa.

8. In the Lagos Plan of Action, it is stated "... We are conscious of the tremendous effort which will be required of us, individually and collectively, to attain the goals we have set for ourselves in these documents. We are confident that we have the determination to overcome the obstacles that may lie in our path and that our Organization and its General Secretariat will be able to enlist the active support of the international community as well as of the relevant international organizations." (OAU 1981).

9. Scientific, Engineering and Youth Societies that are the real motivating force behind a well concerted and organized development process in a country, can play a major role in this process by utilizing the blue-print that is the Lagos Plan of Action. The Plan gives them a well thought-out framework within which to operate. Priority areas in sectors of food, education, health, communication, industries, natural resources exploration, energy, housing and rural development, are all highlighted, and strategies for development suggested. It is essential to ventilate the plan to awaken the interests of research and development institutions, government and non-government organizations, all working in the field to help the development process. There are certain fields of study and research that have to be undertaken as a priority. The development of infrastructure for science and technology base, the establishment, improvement and strengthening of local production capacity, the financing of these activities and the scope for regional and sub-regional co-operation in order to enhance the development process, have all been outlined with sufficient details to enable African countries to grapple with these problems. Scientific and Engineering Societies can highlight these issues and help the development institutions to align their activities in a concerted way.

II. THE PROBLEMS AND CONSTRAINTS TO THE ACHIEVEMENT OF THE OBJECTIVES

10. In Africa, in recent years, difficult economic circumstances compounded by the drought situation prevailing in most of the continent, have greatly limited country efforts to acquire and adopt technologies and to build up the essential technological infrastructure. Furthermore, individual countries have been unable to fully utilize and benefit from the technical research and innovation taking place world-wide, often by non-governmental organizations and in the private sector for various reasons including restrictive trade practices by developed countries and multinational corporations, the inability to negotiate technology transfer, lack of adequate man-power, the reverse transfer of technology etc.

11. In addition, science and technology possess a remarkable and increasing number of internal and external features which affect inter-alia the absorption and diffusion of endogenous development. There is, therefore, a much felt need not only for a close monitoring of such challenging developments but also for bringing African insights, experience and the continent's perception of its needs to bear on the interpretation given to these questions and on the appropriate response necessary to meet these challenges. This is particularly important since the current content and direction of Science and Technology Development appear to be heavily dominated by needs and interests largely external to the region.

12. As mentioned earlier, it is now four years since the adoption of the Lagos Plan of Action and still there is a distinct lack of awareness about its main thrust, amidst the population.

13. On the part of the policy makers, there is an apparent lack of full awareness to the need for a planned, co-ordinated implementation of science and technology activities. Hence, the programmes etc. described in the Lagos Plan of Action are very rarely even mentioned in national development plans and as a result, in preparation of national budget, provisions are rarely made for science and technology activities.

14. In view of the fact that the majority of the African population live in the rural areas, more attention should be paid to this group of people particularly, in the designing and funding of national projects and programmes - this is however usually not the case. Unlike the formal sector, capital for establishing rural or informal sector enterprises are generally hard to come by. Initial capital is generally attained from savings through wage employment and in some cases supplemented by borrowings from relatives and friends, but usually not from governments or banks. Activities in the sector based on individual knowledge and competence decide the extent of customer patronage. Ownership of the enterprise is in the hands of people who had never had the opportunity of formal training and had acquired the trade under masters as apprentices. Both the master and apprentice rank in terms of education, from stark illiterates to poorly educated. Investment in an informal sector

enterprise is very limited and hence there is a marked difference even in the training method from the formal sector. Raw materials utilized by the sector are mainly obtained from the formal sector in the form of scraps through recycling and recuperation from garbage etc. Market outlet for the goods and services produced by the sector is very limited. The working environment which includes sanitation, infrastructure etc. is very poor. There is neglect by the governments in that usually technological activities of the peri-urban and rural areas are not included in most development plans and government statistics records. Management problem in the informal sector is noticeable at first sight. In addition, there is a lack of protection for industries of the rural areas - informal sector.

15. In addition, there is a marked lack of goodwill, for the mobilization of funds at the national level by the government, societies etc. for science and technology activities.

16. In view of the long standing exploitative advantage of Trans-national firms in Africa, one would have expected them to be more involved in local Research and Development activities. It is quite apparent, however, that they contribute very little to training, Research and Development and funding of technological activities locally.

III. ACTIVITIES BY OAU/ECA WITH RESPECT TO THE MANDATE ENSHRINED IN THE LAGOS PLAN OF ACTION

17. The Organization of African Unity and the Economic Commission for Africa in their various activities, seek to compliment individual country efforts and to assist science and technology bodies in Africa to take full advantage of opportunities in technology development.

18. Over the past few years, the OAU and ECA have embarked on the mobilization of all available potentials towards the provision of the necessary support to national institutions so as to enable them to carry out their work in the priority sectors outlined in the Lagos Plan of Action. In line with the priorities outlined in the Lagos Plan of Action, therefore, the ongoing activities of the two Secretariats are centred mainly around: the development of national capacity, the reduction of pre and post-harvest losses in food production, provision of basic needs, particularly to the rural population, and the production of energy, particularly from new and renewable sources.

19. The sole aim of the programme outlined above is to integrate national efforts into regional and sub-regional strategies and supported by international co-operation to constitute a viable basis from which to confront the challenges facing the African continent in the medium and long term. To this end, the OAU and ECA have re-oriented their efforts in order to ensure self-sufficiency for food in the region, sufficient and enough clean water, adequate housing and health facilities, energy in appropriate forms, availability of the basic infrastructures and facilities in education, transport and communications in the region and by so doing, the amelioration of the economic malaise faced by almost the entire continent.

20. In appreciation of the fact that the world is in a period of extremely rapid technological change and that many of these changes are already beginning to have far-reaching impact on the African continent; coupled with the increasingly inter-dependent nature of the global economic and political system, the OAU and ECA have embarked on activities that would facilitate the early identification and assessment of new scientific and technological development which may adversely affect the development process as well as those which may have specific and potential importance for that process and for strengthening the scientific and technological capacities of the African continent.

IV. POSSIBLE VIABLE PROGRAMMES/ACTIVITIES FOR ACCELERATED ATTAINMENT OF THE OBJECTIVES OF THE LAGOS PLAN OF ACTION

21. The purpose of this paper is, in the main, to present a realistic appraisal and programmes to be undertaken in the medium and long term so as to ensure an accelerated attainment of the objectives of the Lagos Plan of Action and the Final Act of Lagos, now in its fifth year. In this connection, it is appreciated that the Chapter on science and technology is the longest and the programme elements highlighted are numerous and efforts are, therefore, concentrated on the development of viable programmes for implementation, say, within the next five years or so.

22. One of the greatest factors that determine the nature, course and direction of the present global economic structure is the advance that are being made in science and technology. The developments in science and technology are destined to accelerate economic growth, social progress, changes in present economic, social and political structures and unified system on a global scale. In order to ensure an accelerated attainment of the objectives of the Lagos Plan of Action and the Final Act of Lagos, it is imperative that attention be focused on the provision of assistance to member States in the formulation of national technology policies and plans as a component of a strategy for technological transformation of each member country, in line with its particular economic and social requirements, and short, medium and long term development objectives. Such a focus would zero in on the execution of projects geared inter alia to the development and demonstration of technologies suitable particularly for rural areas in Africa (since major importance is attached on the potentials of the African rural population and the need to promote their productive capacities through the use of appropriate technologies), the reduction of pre-and post-harvest losses in food, the generation and utilization of renewable forms of energy, the formulation and application of technology policy and planning as called for in the Lagos Plan of Action. However, there is need to re-emphasize the fact that in all these activities, the spirit of the need for attainment of self-reliance and self-sustained development by national governments should be adequately displayed, particularly in the consideration of their national development plans and in the selection of national priorities especially in the face of financial austerity measures, and the crisis situation due to drought and famine faced by many African countries.

23. Within the time frame being considered and taking into account all the possible variables, concentration of the elaboration and implementation of the three sub-sectors of the Lagos Plan of Action listed below would accelerate the attainment of the objectives of the Lagos Plan of Action and would, in addition, reflect the urgency required in confronting the present problems of the continent with a realistic approach which will bring meaningful solution to the needs of the majority of the African population.

24. The elaboration of activities emanating from these areas and modalities for implementation are contained in the "Reports of the Inter-governmental Committee for Science and Technology Development" and "OAU/UNEPSTED project documents and related documents on "Launching the Implementation of the Lagos Plan of Action."

(a) Science and Technology Development

(b) Basic needs (food and agriculture, forestry, health, water, housing and environment)

(c) Industry including energy, transport and communication.

25. For meaningful development based on the above-mentioned three subject areas, horizontal issues such as specific needs for science and technology development e.g. science and technology infrastructure and policy and plan formulation, the choice, acquisition and transfer of technology, development of human resources for science and technology, financing, scientific and technological information, intra-African and Third World Co-operation must be considered.

26. The life-line for accelerated attainment of the objectives of the Lagos Plan of Action is the training of adequate manpower at all levels to meet the immediate needs of member States. The basic argument here is that human resources policy should be carried with exploiting the national take up pool. In the past training was based on the attainment of paper qualification syndrome. Training alone is not good enough, the proper environment to encourage the trained manpower to stay and work in their country should be developed and, in addition, incentives should be created to encourage graduates to return and work in their countries.

27. The subject of lengthy discussion at a meeting of the African Regional Centre for Science and Technology and United Nations Financing System for Science and Technology for Development in Italy in November 1984 was that of collection of technology data processing, information and dissemination of useful information to users at all levels. This has resulted in the development of project documents which are currently being finalized. There is, however, in addition, the need to urgently consider the reverse flow of information from the grass-roots to planners.

28. Food preservation, processing, storage and transportation technologies in the face of the current overall economic situation prevailing in Africa is another priority sector for accelerated implementation of the objectives of the Lagos Plan of Action. This would include:

- (a) development of small-scale food processing plants for rice parboiling and milling, milling and decortication of sorghum, millet etc. and beverage manufacturing;
- (b) solar cells for water pumping/irrigation schemes;
- (c) biogas generation and utilization, improvement in cooking stove design, use of fast growing trees and plants identified and successfully tried in afforestation projects in other developing countries with similar climatic conditions;
- (d) solar energy utilization - driers, stills, heaters, cookers etc.;
- (e) building materials, bricks, building boards, utilisation of agricultural and industrial wastes and by-products;
- (f) mass-media campaigns to educate the public on simple and effective methods of reducing food wastages;
- (g) setting up of appropriate institutional machinery;
- (h) promotion of new methods of food preservation, drying, storage, pest control and processing research, infrastructure development and incentives to food producers;
- (i) transportation facilities with low-cost vehicles;
- (j) training of the requisite manpower for food loss control through workshops and seminars organized at sub-regional and regional levels.

29. Identification of technologies, institutions and industries in food, energy and for training of women; particularly those that are of direct application to the African continent.

30. The informal sector is of potential value to most African governments with respect to reduction of unemployment and training; yet it is at the same time neglected by most governments. Assistance to the informal sector and rural technology in Africa and the possible integration of the informal sector into the formal production sector should be seriously considered. The change being recommended should include:

- (a) Designing of national policies with objectives of:
 - (i) feeding inputs into the productive sectors;
 - (ii) enhancing training through improved on-the-job-training;

- (iii) closing or narrowing the gap between the rural and urban areas thereby assisting with the arrest or rural-urban drift;
- (iv) minimizing or ameliorating the unemployment situation;
- (v) ensuring the adequate utilization of national human and natural resources.

(b) The gamut of policies should ensure the improvement of apprenticeship system, institutional support, access to credit, market and infrastructures, favourable policy environment including improved linkages with the formal sector.

(c) Given the present concern for rural-urban drift, effort should be made to promote non-agricultural employment in the rural areas. Such a policy would not only slow down the growth of the urban informal sector but also pave the way for rural industrialization.

(d) Trade testing, training and trade certification units with the responsibility of enforcing national minimum technical qualification for registration and labour employment conditions and standards should be established.

(e) Policies should be developed to encourage the small scale enterprises to organize themselves and pool their resources with a view to obtaining credit, raw materials and import licenses, the creation of special branch within existing development banks for the informal sector; provision of free or subsidised credit; liberal import licenses and subsidies on essential materials and equipment; exploitation of joint venture possibilities; provision of managerial and technical training facilities and marketing assistance.

31. Water, together with land, sub-soil wealth and human beings is one of the major and basic natural resources on which each individual government should plan the harmonious economic development for its survival and progress. Since water is indispensable to man, animals and plants, it constitutes automatically the limiting factor to such development.

32. In Africa, of late, annual variations in rainfall are relatively large and the rainfall is often erratic, resulting in the current drought situation being experienced. The lack of strong hydrometeorological services has been brought to light by the recent long drought in most African countries which served as a sharp reminder to the extent to which production in agriculture and livestock rearing and human activities in general depend on weather and climate.

33. A high priority should therefore be given to a better understanding of rainfall distribution in particular and to weather and climate in general. Training of manpower in this sector should be stepped-up. Goals for this sector should be:

- (i) better understanding of weather and climate;
- (ii) provision of drinking water in sufficient quantity and good quality throughout each country in order to raise health standards of the population;
- (iii) since fundamental to the goal of socio-economic development of most African countries is the attainment of a significant boost to agricultural production which in turn, very largely depends on the development of national water resources, there is need to make maximum use of surface and ground-water resources both for irrigation and domestic purposes, including livestock;
- (iv) promoting the most relevant use of available water resources and to improve and maintain their quality.

34. Technology and its development is a very dynamic process and the African continent cannot help but get involved in this process. Technological development within and without the continent has a direct implication on the socio-economic development of the continent. It was against this background that the OAU, ECA, UNIDO, UNFSSST and some other international organisations organized a meeting in October 1984, in Mbabane, Swaziland, to review the impact of new and emerging technologies on the development aspirations of the African continent within the context of the Lagos Plan of Action. The meeting considered various sectors such as microelectronics, telecommunications, biotechnology, energy and remote sensing and developed several recommendations, including the need for an "Alert System" or "Advance Warning System" to develop the readiness of the African continent to such changes.

V. SUPPLEMENTARY SUPPORT FROM INTERNATIONAL ORGANIZATIONS, MULTI-NATIONAL DONORS AND COMMON STAND FOR AFRICA AT INTERNATIONAL NEGOTIATIONS

35. Despite the call in the Lagos Plan of Action for the attainment of self-sustained development and self-sufficiency, Africa cannot undertake the development objectives laid down in the Lagos Plan of Action in isolation. The international community have a vital role to play in assisting Africa to attain these objectives. It was against this background that the recent Rome, Italy meeting was organized and specific plea was made to the international community and donors to assist the continent in development of the following priority sectors:

- (i) Information, Exchange Network in Food Technology;
- (ii) Co-operative Research and Development Programme for Production and Processing of Staple Foods in the African Region;
- (iii) Strengthening of Consulting Capacities in Agro-Industries, Food Technology and Energy;

(iv) Strengthening and/or establishing of Training Links and Chairs in Energy and Food Technology.

36. It may be recalled that the Interim Fund for Science and Technology for Development, now known as the United Nations Financing System for Science and Technology Development, was established against the background that Africa has the highest concentration of least developed countries and is the least developed continent. Africa stands to benefit the greatest from the continued existence of UNFSSTD, especially since 40% of the fund should in principle be channelled towards the development of science and technology in Africa. Negotiations for the survival of the System are now in a very critical state and since such a fund could be a vital instrument in the accelerated attainment of the objectives of the Lagos Plan of Action, the African continent should:

- (a) Enhance its participation in the negotiations pertaining to the UNFSSTD (and similar negotiations for science and technology development);
- (b) Accept to pay token contributions according to each country's abilities to the Fund as an expression of good-will and interest in the survival of the Fund;
- (c) Ensure that the continent is adequately represented at all policy-making organs in the Fund;
- (d) Ensure that with the assistance of the OAU and ECA, an African Common position on all issues to be discussed during the negotiations is adopted prior to the negotiations;
- (e) Special effort should be made to reorient training of science and technology manpower through coordinated programmes in schools, colleges and universities;
- (f) Strengthening of activities of NEIDA (Network of Educational Innovation and Development for Africa) and ANSTI (ANSTI (African Network of Science and Technology Institutions));
- (g) Organization of seminars and workshops for technical staff, deans and rectors on curricula development, low cost school science equipment, better management of educational and Rural and Development institutions;
- (h) Assistance to member States in harmonizing their national policies on matters of Science and Technology at sub-regional and regional levels and a harmonized system of exchange and dissemination of research experiences and results.

VI. CONCLUSION

37. Accelerated attainment of the objectives of the Lagos Plan of Action and the Final Act of Lagos in the sector of science and technology can only be realised if member States accord the highest priority required for strengthening mechanisms or machineries for co-ordinating activities in this field, where such bodies already exist, or for establishing such bodies where they do not exist. The intersectoral nature of science and technology makes it essential that such co-ordinating bodies be established and encouraged.