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EVALUATION OF THE PROGRAMME OF THE
UNITED NATIONS TRANSPORT AND
COMMUNICATIONS DECADE IN AFRICA

MODAL EVALUATION :
SECTOR : TELECOMMUNICATIONS
FINAL REPORT

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SUMMARY

The Transport and Communications Decade in Africa (1978-1988) proclaimed by the United Nations General Assembly in its resolution 32/160 dated 19 December 1977 is drawing to a close. The purpose of this report is to analyse and evaluate the results achieved in the implementation of the Decade programme with respect to the telecommunications sub-sector.

A brief introduction was made on the state of telecommunications before and at the time of the proclamation of the Decade which was mainly characterized by the conception and implementation of the PANAFTEL project thanks to the combined efforts of the ECA, OAU, UNDP and ITU as well as the PANAFTEL Co-ordinating Committee composed of OAU, ECA, PATU and ITU. In addition to this introduction, Chapter One describes the global objectives of the Decade in regard to telecommunications and compares them with the immediate objectives which fall within the scope of the Decade global objectives. An analysis is also made of the relevant strategies developed to achieve the immediate objectives of the sub-sector. These relevant strategies obviously form part of the global strategy of the Decade described in document E/CN.14/726-E/CN.IN/TRANS/147 and consist in the setting up of co-ordination and control mechanisms as well as the mobilization of the necessary material, financial and technical resources. Chapter One ends with the analysis of the Decade programme which comprises two phases: phase one covers the period 1978 to 1983 and phase two 1984 to 1988. Phase one comprises 92 projects and phase two 216 projects, 76 of which were transferred from the first phase.

Chapter II deals with the role of the various actors in the implementation of the Decade. ECA as the lead agency for the Decade was assigned the role of co-ordination, supervision and resource mobilization. This task was a rather difficult one in so far as the mechanisms set up did not all produce the expected results. UNDP was the major donor for the Decade. ECA was able to discharge its responsibilities as lead agency for the Decade thanks to the funds made available to it by UNDP which also financed projects.

OAU contributed to the promotion of the Decade and obtained the commitment of the African Heads of State to "execute completely the programme for the United Nations Transport and Communication Decade in Africa". PATU and ITU as telecommunications specialized agencies of OAU and UN respectively mainly played the role of co-ordination and technical assistance leading, among other things, to the organization of conferences, seminars and meetings on specific areas of telecommunications. ITU is also the executing agency of PANAFTEL projects RAF/73/023, RAF/80/060 and RAF/80/018 financed by UNDP. ECA, OAU, PATU and ITU are members of the PANAFTEL Co-ordinating Committee.

ADB, established to help in the development of Africa, did participate in the financing of some telecommunications projects. However its resources and capabilities should have been exploited to a much greater extent in the implementation of the Decade programme. The subregional organizations such as PTA, ECOWAS and UDEAC had an important role to play in the implementation of projects, particularly within the framework of the PANAFTEL network. African governments also had special responsibilities in the implementation of the

programme, as basic components of the mechanisms set up for the implementation of the Decade programme. However, the co-ordination at national level and project follow-up have not always been done as expected. Chapter Three deals with the results achieved in the implementation of the Decade programme. The results of the first and second phases are given therein. The evaluation of the results of the first phase has shown that out of 92 projects estimated at US\$675,550,000, only 18 were implemented to the tune of US\$153,590,000, representing 22.70% of the total financing required, of which the African governments provided US\$113,090,000, corresponding to 28.05% of the funding obtained. The results of the second phase have shown that out of 216 projects estimated at US\$2,696,870,000, only 63 projects were financed for a total amount of US\$461,520,000, representing 17.32% of the total financing required, of which the African governments provided US\$86,140,000, corresponding to 18.91% of the funding secured.

The overall programme of the Decade comprises 232 projects estimated at US\$3,077,860. In all 81 projects were implemented for a total amount of US\$615,100,000, representing 20% of the estimated cost. Of this amount, US\$129,230,000 corresponding to 21% of the funding obtained, was provided by African governments. External funding which amounted to US\$485,880,000 representing 79% of the funding secured is by far the highest.

Admittedly, on the whole, the objectives have not been fully achieved. Nonetheless, very significant progress has been made. The telephone penetration which constituted the basic objective of the Decade and which was set at 1 telephone per 100 inhabitants, increased from 0.4 telephones per 100 inhabitants in 1977 to 0.65 telephones per 100 inhabitants in 1986. The telephone growth increased from 8% in 1977 to 12.09% in 1986. Very significant progress was also made with the implementation of the PANAFTEL network. All the countries of the East and Southern African subregion are practically linked up with automatic devices. Though the West African subregion has practically installed the various stations, it has not yet achieved the same result as the East and Southern African subregion on account of the fact that it has not completed the interconnections among the different neighbouring countries and implemented its transit plan. The Central African region, for its part, is seriously lagging behind compared to the other subregions and will have to make considerable efforts and be provided with greater assistance to be able to catch up. Operation and maintenance will require the elaboration and implementation in each African country of a national improvement and maintenance plan in accordance with the guide prepared by the PANAFTEL Co-ordination Unit based in Ouagadougou and known as project RAF/80/018.

With regard to training, considerable efforts will be required to strengthen the national centres and meet the growing needs in the field of in-service specialized training and retraining.

Good management based on full autonomy of telecommunications services, indeed the separation of domestic telecommunications services from postal services and the merging of the former with international telecommunications services, as well as the flow of information, use of central panels, organization charts, performance indicators etc., has not always been practiced in many African countries.

The elaboration and implementation of a telecommunications master plan still have to be done. Rural telecommunications have not been developed and will be developed only with the implementation of the RASCOM project.

The manufacture of telecommunications materials could not be developed due to lack of initiatives in this field. The chapter ends with the key factors that contributed to the implementation or otherwise of the Decade programme.

The factors that contributed to the implementation of the projects were mainly bilateral financing and supplier's credits.

The factors that impeded the implementation of the programme include lack of resources and experience, the magnitude of the programme, lack of follow-up and support on the part of the African governments, the weakness of the Co-ordination Unit and lack of planning of objectives.

Chapter IV deals with the lessons to be drawn from the implementation of the Decade, particularly the sensitization of African and international public opinion to the shortcomings of transport and communications systems in Africa, the need for the African governments to give high priority to transport and communications in their national plans and to have the necessary financial resources for the success of any development programme. Chapter V concerns the recommendations on ways and means of promoting the development of telecommunications. The following are the major recommendations:

1. A ten-year plan covering the period 1991 to 2000 should be implemented with a view to attaining the transport and communication objectives within the context of the Lagos Plan of Action;
2. The period 1988-1990 will be used to ensure adequate preparation and planning towards the full implementation of the ten-year programme;
3. The Conference of Ministers scheduled for Kinshasa in March 1988 should charge the Inter-Agency Co-ordinating Committee with preparing the terms of reference and the mechanisms for the conception and implementation of the ten-year plan;
4. The Conference of Ministers of Transport, Communications and Planning will continue to meet every two years as in the past as the supreme body for the implementation of the ten-year plan;
5. ECA will, as in the past, play the role of lead agency for the ten-year plan and should use the experience already acquired during the Decade in playing a much more active role in the implementation of the programme;
6. The co-ordination mechanisms of the PANAFTEL Co-ordinating Committee should be reviewed and improved with a view to ensuring the highest performance rate and the best follow-up possible;
7. The telecommunications ten-year programme should be based on a master plan, the components of which should be drawn from the PANAFTEL

programme which should be strengthened by adapting it to the global strategy of the Lagos Plan of Action and followed by all intergovernmental and United Nations agencies involved in the development of telecommunications in Africa;

8. Special attention should be paid to the least developed countries with the aim of promoting the development of their networks. Many countries have a telephone penetration of 0.1 direct exchange line per 100 inhabitants. The ten-year plan should take this fact into account and steps should be taken to ensure that at the end of the ten-year plan no African country has a telephone penetration below 0.50 telephones per 100 inhabitants.
9. All the earth links provided for in the PANAFTEL project should be completed. In this connection, the Central African subregion which is seriously lagging behind compared to the other subregions should be given special assistance to enable it to catch up.

Other recommendations were made on the harmonization of tariff systems, the implementation of transit plans, the interconnection of networks of neighbouring countries, maintenance and rehabilitation, rural telecommunications and the manufacture of telecommunications materials.

CHAPTER I

ANALYSIS AND EVALUATION OF THE DEGREE OF IMPLEMENTATION
OF THE GLOBAL OBJECTIVES OF THE DECADE1.1 Telecommunications in Africa before the Proclamation of the Decade1.1.1 Introduction

Africa is the least developed continent in terms of telecommunications. The continent's under development in this sector is such that considerable efforts are required politically, economically and financially in order to improve the situation significantly. In the wake of the massive attainment of independence in the 60s, telecommunications networks and equipment were so outdated and on such a very small scale that only North Africa had fairly acceptable networks, whereas in most African countries, only the capital cities could boast of an automatic network which, in fact, was not very extensive. Interurban and international links were effected through H.F. overhead lines and in rare instances by cables. At the same time, in America and Europe, the various telecommunications sectors were undergoing phenomenal changes with the introduction of solid components and the mastery of hyperfrequency techniques which had paved the way for the use of satellites for telecommunications purposes. On the other hand, microwave links replaced all other earth link modes on account of their reliability and their extensive capacity. Similarly, in switching operations, mechanical exchanges gave way to electronic exchanges. Under such circumstances, the leaders of African countries could not help but become aware of the need to provide their countries with adequate means of communication which are vital for ensuring the economic development of the continent.

1.1.2 Development of the PANAFTEL Network

During the meeting of the African Planning Commission, held in Dakar in 1962, African telecommunication administrations decided to create a PANAFTEL network to link up national networks in such a way as to eliminate transiting through the large European cities, as well as to develop interurban national links at the same time. Apart from the substantial resources required, there was need for very strong political will, which ECA succeeded in arousing in 1963, with the signing of an agreement with the International Telecommunications Union, aimed at co-ordinating all efforts geared towards the development of telecommunications in Africa. ECA, UNDP and ITU jointly undertook studies relating to the technical and financial resources required and applied the most economical networks for implementing the PANAFTEL network. In 1971, the Summit Conference of African Heads of State called for the establishment of the PANAFTEL network.

A Co-ordinating Committee comprising the OAU, ECA, PATU and ITU was formed to support and monitor the implementation of PANAFTEL. Thus, pre-investment studies were launched around 1968 and completed in 1973. African countries began to make considerable efforts towards the establishment of the network.

In 1977, telephone penetration was approximately 0.4 telephones for 100 inhabitants.

1.2 Overall Decade Objectives in the Telecommunications Sector

The following global objectives were set for the Decade:

- Improvement and expansion of national networks;
- Interconnexion of the capitals of the African countries without extra - African transiting;
- Harmonization of tariff systems and international accounting procedures in Africa;
- Development of telecommunications and electronic industries in Africa;
- Measures to meet manpower needs at all levels of specialization, particularly a training programme of skills, including professional university trained engineers over the Decade;
- Development of various telecommunications systems connected with transport services, in particular aeronautical and maritime;
- Development of remote sensing facilities.

1.3 Comparison between the overall objectives and the immediate objectives of the telecommunications sub-sector

The attainment of these objectives should facilitate the total integration of the various telecommunications networks, as well as ensure effective co-operation among African countries and their economic development.

The immediate development objectives of the telecommunications sub-sector are those which should be attained during the Decade, through specifically planned regional, subregional and national projects. These objectives can generally be summarized as 1 telephone per 100 inhabitants and 1 public telephone booth for 10,000 inhabitants in rural areas throughout the continent, to be attained in the course of the Decade. The attainment of these objectives can only be achieved through the execution of a telecommunications development programme at all levels, for each African country.

1.3.1 Development and strengthening of national networks

Each Administration will have to set its own target by the end of the Decade. It is proposed that an annual growth rate of 14% and a telephone penetration rate of 1% in all African countries be achieved.

1.3.2 Pan-African Telecommunications Network (PANAFTEL)

The Decade objectives are:

1.3.2.1 To complete the implementation of essential components of the network, already identified, which for some reason are being held up;

1.3.2.2 By the end of the Decade, most calls within and between African countries should be possible by automatic operation subscriber-to-subscriber using the recommended signalling systems;

1.3.2.3 The tariff structures of all African countries should have been examined and where necessary, modified and harmonized so that service will be encouraged, and calls will be possible at a rate which the subscriber can afford at the same time giving an adequate return on invested capital to the operating agency;

1.3.2.4 Agreements should be reached for the settlement of accounts between African countries having direct communications relations;

1.3.2.5 Services for other than public telecommunications should, wherever possible, use the public network both national and international, on a leased basis rather than a parallel privately-owned and/or operated network;

1.3.2.6 The network should be sufficiently well maintained so that connections may be made with the availability and quality called for in CCITT/CCIR recommendations;

1.3.2.7 It should be possible to reduce the leadtime between the identification of a need and the placing in service of the necessary equipment to under five years;

1.3.2.8 All systems which form part of the PANAFTEL network but which are not compatible with or do not conform to the standards of the rest of the network should be replaced;

1.3.2.9 The PANAFTEL Network forms part of the World Telecommunications Network and must therefore be integrated with the networks already existing or being built up in other continents. The interconnection of PANAFTEL with the World Network especially to Northern Europe, the Middle East and the Mediterranean should be achieved;

1.3.2.10 There should be available in Africa a number of centres capable of devising or assessing technological developments and selecting or modifying them to obtain the maximum from them under African conditions.

1.3.3 Training With regard to training, the Decade objectives are:

1.3.3.1 Training needs surveys covering North, West, and Central African countries should be undertaken as soon as possible;

1.3.3.2 Each country should develop its own training facilities and provide courses catering for at least its basic training requirements (level 4 capability);

1.3.3.3 Where possible, training centres should also provide medium level courses (level 3 and part of level 2 capability). If not, use should be made of multinational training centres;

1.3.3.4 Regional training centres, catering for levels 2 and 3 capability, should be established for the Central African Administrations and the Lusophone countries;

1.3.3.5 High level training courses (part of level 2 and level 1 capability) should be developed for the majority of identified requirements and be provided on the continent in high-level institutions;

1.3.3.6 In-service and other special training courses such as maritime communications, etc. should as required be developed;

1.3.3.7 Training courses in all levels of capability should not be limited to technical but should also embrace non-technical staff and provide courses in areas such as finance, management, personnel, mechanical aids, etc. Training thus received should also be consolidated in the field and supervisors should continuously undertake on-the-job training and provide relevant feedback on trainees performance to the training centre;

1.3.3.8 Since it is agreed that training activities should be co-ordinated to satisfy service requirements, it is most important that telecommunication training establishments in each country are, administratively, under the Director of Telecommunications and a sufficient budget for training purposes be provided on a yearly basis;

1.3.3.9 Instructors posts should, as far as possible, be localized. The exchange of instructors who could run specific courses should be encouraged - a move which would foster technical co-operation amongst developing countries;

1.3.3.10 Specialized short duration courses for the training of trainers should be followed by instructors. These courses could be provided by high-level institutions.

1.3.4 Management

The Decade objectives, in terms of management are:

1.3.4.1 Survey and evaluation of existing policies or procedures for suitability and applicability under the present conditions prevailing in the telecommunication administration should be made prior to any attempt to reorganize an office or department;

1.3.4.2 Partial and gradual re-organization of an office/department should be introduced which is considered vital in the operation and administration of telecommunication services;

1.3.4.3 Establishment or creation of a new office/department should be made where there is none and/or when necessity demands that the creation of an office will help improve the management of the Telecommunication Administration;

1.3.4.4 Survey, evaluation and in-depth report of the management and administrative requirements must be carried out to determine the level or kind of assistance required, particularly, where major re-organization is being contemplated by the Telecommunication Administration;

1.3.4.5 Major re-organization either by separation from postal administration or re-structuring (e.g. by separation of budgets and accounts for each service, etc.) of the Telecommunication Administration should be instituted based on the results of study and recommendations prepared for this purpose. The streamlining of the Telecommunication Administration should be made within the proper framework of the government regulations and where required an enabling legislation must be prepared to effect the necessary re-organization;

1.3.4.6 Preparation of functions, duties and responsibilities of offices, departments or bureaux must be made to ensure that duplication of work has been eliminated;

1.3.4.7 Preparation and standardization of job and wage classifications, job descriptions, duties and responsibilities of personnel for all classes of worker must be accomplished in the Telecommunication Administrations.

1.3.5 Planning

With regard to planning, the Decade objectives are:

1.3.5.1 As soon as possible and well before the end of the Decade, there should be a planning unit/office in every Telecommunication Administration;

1.3.5.2 Preparation and/or development of a fundamental plan. Alongside development planning, an investment plan and resource requirements must be prepared for possible fund support;

1.3.5.3 Fundamental plans prepared by the Telecommunications Administration should be reviewed, modified and/or upgraded as necessary in keeping with the growing demand for telecommunication services. Associated investment plans and rolling plans for implementation should be drawn up;

1.3.5.4 Preparation of general specifications for systems/networks, switching and cable facilities, power and building facilities, etc., as well as specifications, general tender document, and other documentation necessary for successful implementation;

1.3.5.5 In-depth study and evaluation of the planning requirements for each Telecommunication Administration must be made to determine the kind of assistance required;

1.3.5.6 Special training and/or on-the-job training should be given planning staff to ensure development of self-reliance in planning.

1.3.6 Operation and maintenance

The objectives in this area are:

1.3.6.1 Creation in every country of an "Operation and Maintenance" Unit headed by a chief fully responsible for the entire "Operation/Maintenance" sector;

1.3.6.2 Study and adoption by every country of a precise and detailed structure and organization chart for operations and maintenance with a plan for introduction 1983/1987;

1.3.6.3 Study and adoption by every country of objectives for service quality/availability measured by a few simple parameters. Need for intercountry standardization;

1.3.6.4 Introduction in every country of plans and procedures for maintenance giving priority to:

- the international network;
 - the national network
- with need for intercountry standardization.

1.3.6.5 Gradual introduction of necessary provisions for staff and material:

- adoption of model maintenance budgets;
- adoption of model staff strength per service.

1.3.6.6 Development of human resources. On-the-job retraining or group training periods for all those responsible for maintenance centres or services with objectives specific to their sectors (a few weeks for each unit, on average);

1.3.6.7 Application of measures to increase appreciation of technical functions;

1.3.6.8 Overall objective by the middle of the Decade (1983) - complete introduction of operational and maintenance services in all countries: organization - structure - procedures - manpower and material - motivation.

1.3.7 Rural telecommunications

Targets for individual countries will necessarily be different from each other depending on the individual needs, the manpower and material resources. For the Decade, the objective to be attained is: 1 public telephone booth per 10,000 rural population.

1.3.8 Manufacturing

The objectives in this area are:

1.3.8.1 To ensure that by the end of the Decade, African countries are self-sufficient in most of the items needed for:

- external plants;
- internal and external structures;
- distribution systems for air conditioning;
- cable ducts (concrete, plastic, asbestos);
- cables;
- building tools;
- spare parts.

1.3.8.2 To ensure that the following subscriber apparatus is assembled during the Decade

- telephone instruments (ordinary and intercommunication)
- switchboards
- private exchanges (PAX, PABX, PMBX)
- concentrators while providing for their full manufacture at the end of the Decade or in the subsequent years

The objectives are very relevant to the overall objectives of the Decade. The continent's needs in the area of telecommunications are enormous and require considerable financial, technical and human resources.

1.4 Analysis of relevant strategies mapped out to attain the immediate telecommunication objectives

Document E/CN.14/726-E/CN.IN/TRANS/147 defines the global strategy of the Decade, taking into account general development objectives. The telecommunication sub-sector is one of the main components of the overall communications sector, the programme of which reflects the desire to promote the socio-economic development of the continent.

To ensure the success of the Decade, it was necessary to set up co-ordination and central mechanisms. Each government was called upon to set up appropriate Decade follow-up mechanisms. This role is played at subregional level by the MULPOCs whose establishment was decided by the third ECA session in 1977. At regional level, a biennial meeting of the Ministers of Transport, Communications and Planning has been institutionalized to ensure the co-ordination and control of the Decade programme.

At the time of the proclamation of the Decade, the United Nations organization called on all bodies within or outside it to co-operate to ensure the success of the Decade. In that connection, an Inter-Agency Co-ordinating Committee was set up with ECA as lead agency. With regard to telecommunications, the Committee in charge is the PANAFTTEL Co-ordinating Committee composed of representatives of ECA, OAU, ITU, PATU and ADB. The establishment of this Committee was decided by the Heads of State.

The Committee was entrusted with the task of collecting and collating the documentation needed for the preparation of periodic reports for the Conference of Ministers. Reports adopted by this Conference are to be sent to the UN Secretary-General for presentation to the UN General Assembly through the Economic and Social Council, and to the OAU Secretary-General for submission to the OAU Assembly of Heads of State and Government.

The implementation of the programmes and projects within the framework of this strategy required substantial material, financial and technical resources provided by the International Community to supplement local resources. A meeting of donors was convened by the UN Secretary-General in 1979 for the funding of the programmes. Each of the immediate objectives was backed by the implementation of relevant strategies.

1.4.1 Development and strengthening of national networks

The objective set is one telephone per 100 inhabitants for the entire continent and a 14% annual growth rate. At the time of the proclamation of the Decade in 1977, the telephone penetration for the entire continent was 0.4%. A 1% rate would be equivalent to over 150% growth of the total number of telephones. Even if it is true that Africa is seriously lagging behind compared to other continents, it is equally true that the objective to be set should be commensurate with the capability of the African countries. It is a fact that the major characteristics of national telecommunication services of African countries, with the exception of North Africa, are inadequate material resources, lack of manufacturing of equipment and inadequate qualified personnel. National development plans, where they exist, are conceived on the basis of a 10% annual growth and sometimes less. Furthermore, more often than not, it happens that the 10% annual growth target is not attained. The major impediment to an appropriate expansion of telecommunication networks, apart from lack of management and qualified personnel, is inadequate resources and funding. Besides, the degree of priority given to telecommunication development by the planning institutions is relatively low. For instance, in terms of GDP percentage, the estimated average of national investments (all things being equal) to promote a rapid expansion to a level equivalent approximately to international standards is between 1 and 2. In Africa, however, the current average is 0.05. On the other hand, the development of telecommunications does not only concern only local and switch networks; inter-urban and inter-State links (PANAFTTEL) are also included in the strategy. Admittedly, actions for resource mobilization have been undertaken within the framework of the strategy for the implementation of the Decade projects. However, as far as the telecommunications sub-sector is concerned, not much has been done. Table 1 shows the telephone penetration in Africa in 1978 and 1986.

1.4.2 Pan African Telecommunication Network

The strategy used, as far as the Pan-African Telecommunication Network is concerned, is a series of measures likely to promote the network's automatic operation with the availability and quality called for in CCITT/CCIR recommendations. After the launching of the PANAFTTEL project before the proclamation of the Decade and in order to ensure the effectiveness of this vast continental telecommunication network, a Co-ordinating Committee has been set up since 1973 through the joint action of ECA, ITU and UNDP. This Committee whose headquarters is in Addis Ababa and whose membership includes ECA, OAU, ITU, PATU and ADB implemented, thanks to UNDP funding, project RAF/73/023 which made it possible to determine communication paths, prepare technical specifications of equipment, complete works on some sections of the network and carry out maintenance services. It also implemented project RAF/82/060 which made it possible to give relevant advice on initial installations as well as other operational aspects for the development of the network and the necessary co-ordination for its implantation. Maintenance problems were taken care of by other projects specially conceived for that purpose. At the end of 1986, the PANAFTTEL network developed 43,000 km transmission links, 35,000 km of which are micro-waves, and 8000 km submarine cables. Forty-six African countries also have ground stations. What is needed now is funding for the missing sections of the network evaluated at about 8000 km of earth links, 8 international transit centres and 4 ground stations. In order to ensure the implementation of the missing sections and the complete integration of the network, negotiations are underway for the setting up of project RAF/87/011 which will constitute phase III of the project and should lead to the construction of the missing sections, the implementation of the traffic channel plan at the continental level and the settlement of international traffic accounts.

Meanwhile, the ambitious plan aimed at interconnecting the various African capitals has only been partially implemented (North, Southern and Eastern Africa). The communications of the majority of countries still continue to be routed through transit centres outside Africa, especially transit centres in Europe.

In addition to the reasons given to explain the non-attainment of the objective of the national networks, one can mention difficulties related to inter-State co-ordination and operation, lack of agreements on terminal and transit traffic, absence of a regional tariff system and maintenance problems.

Tariff applied for links between different African countries are very high because they take into account the distances covered to establish the communications and not the distance separating the countries. Actions were undertaken by the PANAFTTEL Co-ordinating Committee both at regional and subregional levels to correct the situation. It was thus that the third African Conference of Telecommunication held in Monrovia in 1980 called on African telecommunication administrations to harmonize their tariffs. Even if agreements on tariffs have been reached, as is the case with ECOWAS countries and Southern and Eastern African countries, the most important thing is the implementation of such agreements by all the countries concerned.

The PANAFTEL Co-ordinating Committee or any mechanism set up to that end should be provided with the necessary means to ensure the implementation of the agreements. The same applies to traffic routing.

1.4.3 Operation and maintenance

The basic objective of any telecommunication installation is obviously its operation, maximum operation if possible, with a view to generating resources. Though tremendous progress has been made in Africa during the Decade in the field of telecommunication development, the operation of these new assets both in regard to the old technology and frontier technology poses serious problems to telecommunication administrations. Several countries are faced with serious problems in the operation of their networks, particularly high frequency systems (direct visibility microwaves and trans-horizon microwaves).

The major factors impeding maximum operation are:

- Absence of systematic maintenance policy, or, where it exists, lack of organization or logistic resources weighing heavily on its effectiveness;
- The very high operation cost of the old generation of telecommunication equipment (microwave links with repeaters powered by generators or turbo-generators, cross/bar electro-mechanical exchanges. The operation costs of transmission systems powered by generators are so high that in many countries, and even sometimes, as in the case of the Conakry - Freetown and Monrovia - Freetown links, the links are purely and simply out of use due to fuel problems;
- Lack of funds to acquire spare parts and absence of effective regulations to that effect;
- Lack of funds to ensure regular supply of oil to the remote repeater stations and absence of a supply follow-up mechanism;
- Lack of inter-State standardization of quality/availability parameters of service;
- Lack of qualified personnel and training and further training policy for the cadres;
- Absence of tariff and transit agreements among African countries;
- Lack of motivation on the part of the qualified personnel;
- Transit tariff offered by transit centres outside Africa under favourable terms;
- Inadequate facilities in the international centres and multiplex terminals for transit traffic;
- Problems of co-ordination of signalling systems.

Project RAF/80/018 with its headquarters in Ouagadougou was set up following the recommendations of the third Conference of African Ministers of Telecommunications held in Monrovia in 1980 with ITU and UNDP assistance to help African countries make substantial improvement in the quality of their services. A strategy such as this should help improve significantly the quality of services offered subscribers and increase considerably the incomes of the administrations. The measures recommended in this strategy have been thoroughly examined by project RAF/80/018 which has already undertaken actions to help African countries improve or set up their maintenance systems. Under this project, workshops and seminars on maintenance of equipment have been organized for African maintenance personnel from all countries. At those workshops and seminars, all areas of telecommunication (local networks, switching, transmission, energy) were discussed, as were measures likely to improve the quality of service. Following these workshops and seminars, a new strategy was formulated with the co-operation of telecommunication technicians and officials in Africa. This new strategy consisted in preparing for each African country, a "national improvement and maintenance plan" aimed at setting up a real maintenance policy and bringing the service quality parameters (availability of transmission links, efficiency rate of telephone calls, number of annual disruptions per line of subscribers, rate of disruptions in 24 hours, 48 hours and in the week, etc.) to acceptable levels. A manual on the elaboration of the national improvement and maintenance plan has been prepared and distributed to all African countries. Several countries have begun preparing their plans and even some (two or three) countries have already come up with projects which should be finalized. After the elaboration of the national improvement and maintenance plans, the necessary funds should be sought for their implementation. The Decade objectives relating to operation and maintenance are far from being attained. Apart from financial, material and organizational reasons, the deadline set to conceive and implement a national improvement and maintenance plan was too short. There is need for another deadline to give African countries time and the necessary financial, material and human resources to prepare and implement their national improvement and maintenance plans.

1.4.4 Personnel training

Telecommunication administrations of African countries face serious difficulties in the training of their personnel, be it basic or practical training. The objective of the Decade is to ensure first and foremost that each country develop its own training facilities to provide courses catering for its basic training requirements, that multinational centres catering for medium level courses be established in Central Africa and for the Lusophone countries and that multinational high level training centres cover all the needs of African countries. Table 2 attached to this report as Annex 3 shows the distribution of training centres in African countries. As can be seen, only 5 countries have only one training centre, 21 countries can provide courses for levels 4 and 3, that is up to the medium level (controllers), 8 countries can train level 4 and only part of level 3. 12 countries can provide full or partial training courses for level 2. Two countries, Algeria and Nigeria, offer courses for level 1, that is professionally trained telecommunication engineers. Considerable progress has been made in terms of training of basic,

medium and high levels. The number of professionally trained engineers is still very inadequate in most African countries. In order to attain the global objectives of the Decade which tally well with the immediate telecommunication requirements, there is need for competent and very high level personnel capable of mastering as quickly as possible the greatest technological inventions. In many countries, telecommunication schools are placed under the direct authority of the Director of Telecommunications. However, there is still a large number which come under Education. The training objective also provides for the training of telecommunication personnel in such other areas as finance, management, mechanical assistance etc. The various telecommunication administrations of African countries use more and more these types of training which should provide them with better management of their resources. In the absence of specific data on training and retraining programmes, it is not possible to make a quantification.

The important thing to note is that progress has been made and that much still remains to be done to attain the training objective which should be given special attention in telecommunication requirements planning.

1.4.5 Management

All telecommunication administrations are faced with management problems. To be viable, a telecommunication enterprise should have good management. The strategy developed to ensure good management should make it possible to attain this primary objective. Most of the administrations have been bequeathed archaic structures by the colonial powers, which combine both posts and telecommunications. Modern telecommunications management increasingly advocates the business-like approach, grouping national and international telecommunications into a single entity. This of course presupposes not only a change in status along the lines of greater administrative and financial autonomy, but also separation of national and international postal services from national and international telecommunications.

Such a separation will guarantee for the two enterprises thus created greater efficiency and maximum utilization of human, financial and technical resources. The management methods will be geared essentially towards attaining the objectives set and ensuring effective planning, the results of which will be regularly controlled. Specific objectives set in advance and accepted by the personnel should lead to sound management and the development envisaged. In this regard, use will be made of a master plan, job descriptions, an organization chart, control panel, performance indicators, progress reports, etc. while avoiding red tape which might have very negative consequences. A good management will first and foremost aim at meeting the needs of the subscribers and the staff. Not only should telecommunication enterprises ensure a high quality service, they should also formulate the best strategy possible to recover the monies owed by the subscribers. The medium-term effects of such a management will be:

- A tremendous improvement in the service offered the users;

- Self-financing of all the investments which will be made;
- Opening up of rural and remote areas.

Unfortunately, the process for separating post and telecommunication entities has not been completed and depends on the governments of the various countries. Under these circumstances, the development will no doubt be slower than expected.

1.4.6 Planning

Planning is one of the most effective tools for improving management, developing enterprise and controlling funds. As the basic strategy for any balanced development, it should make the projections of the enterprise and set objectives through regularly up-dated and controlled programmes. The Decade has set as objective the preparation of an adequately flexible telecommunication master plan for effecting changes, and general specifications for systems/networks, switch installations, energy installations, buildings, etc. Many countries still do not have telecommunication master plans. Some are in the process of preparing one while others have not started.

With regard to specifications, special skills and a certain amount of experience are needed. Alongside the preparation of a master plan, it will be necessary to train the planning staff in order to make them more competent and more self-reliant. Countries with neither a planning unit nor master plan should seek the services of such institutions as ECA, UNDP and ITU to assist them in drawing up their plans.

The objective set by the Decade will not be attained by all the countries at the end of the Decade. However, it is necessary for each of them to attain it in a near future so as to lay the necessary foundation for rapid telecommunication development.

1.4.7 Rural telecommunications

It should be recalled that the Decade objective is 1 public telephone booth for 10,000 inhabitants. This objective, just like the one relating to telephone penetration, is a very ambitious one and requires an extremely important development of urban, inter-urban and international networks. Major inter-urban links should be set up, as well as all urban networks and the group centres which will be linked up with selected localities.

Another problem faced is the financial unprofitability of the rural links which should be operated at a loss at the initial stage. Now, telecommunication administrations are generally faced with management problems and very often serious financial difficulties. As a result, at the end of the Decade, the objective set is very far from being attained. Its attainment, however, is of vital necessity for the development of African countries. During the Decade, following a recommendation made by the ITU Conference of Plenipotentiaries held in Nairobi in 1982, an independent commission was set up to study all

possible ways and means of promoting the development of telecommunications in the world in general, and in the developing countries in particular. This Commission submitted its report entitled "The Missing Link" to the World Conference on Telecommunication Development held in Arusha, Tanzania in 1985. Telecommunication in developing countries in general, and African countries in particular was one of the main agenda items of that Conference.

However, real development of rural telecommunication will be possible only with the implementation of the RASCOM project, the feasibility studies of which constitute project SAP 60-001 of the telecommunication sub-sector of the second phase of the Decade. The RASCOM system should be a combination of earth and satellite links so as to ensure the best development possible and attain the rural telecommunication objective. Full financing of the feasibility project study has been obtained and its implementation process has begun. A national co-ordinating committee (NCC) has been set up in each country. The task of this committee is to prepare studies which will be the subject of national feasibility reports that will provide all the data and parameters necessary for the establishment of integrated telecommunication and broadcasting networks meant to serve especially rural and remote areas. This study will be completed in 1988 at the earliest. The next step will be the implementation phase which will require first of all funding for the entire project.

Under these circumstances, the rural telecommunication objective which is now linked to the RASCOM project will not, ceteris paribus, be attained before five years, at least.

1.4.8 Manufacturing of telecommunication equipment

This Decade objective is one of the most difficult to achieve. Yet, it constitutes one of the basic factors of the strategy for the speedy development of telecommunications in Africa. Despite the provisions contained in the Arusha Declaration which called on governments, telephone equipment manufacturing companies and private operating agencies of developed countries to participate actively in the establishment and strengthening of national research and development centres already existing or to be created, and to help, where possible, in the setting up of manufacturing plants in developing countries, taking into account the appropriate steps for transfer of technology, the situation has hardly changed since the proclamation of the Decade and after the Arusha Conference. Developed countries have not really responded to that invitation and African countries have still not found adequate resources for the attainment of that objective.

Some countries are trying more or less to provide themselves with some kind of telecommunication industry but they are still faced with enormous financing difficulties. Even supposing that these problems were resolved, there would still be the problem of competitiveness of products, unless modalities were found for a transfer of non-restrictive technology.

The attainment of the objective, after the Decade, will entail considerable efforts on the part of ECA, UNDP, ITU and UNIDO for the financing of

industrialization projects on the continent to meet the overall needs of African countries in the manufacturing of all the telecommunication equipment enumerated in paragraph 1.3.8.

1.5 Analysis of the implementation of the Decade programme

The Decade programme is divided into two phases. The first phase covers the period 1979-1983 and the second, 1984-1988.

Since many programmes financed by African governments themselves as well as by external bilateral and multilateral sources were already underway, it was decided that the first phase of the Decade would be devoted to the pursuit of the implementation of existing projects as well as projects identified but awaiting financing, and identification of new projects. Material and even purely financial project evaluation initially posed serious problems on account of lack of adequate information. Indeed, many African governments had serious difficulties in providing ECA with reliable data on project implementation. With regard to the telecommunication sub-sector, the operation initially concerned mainly regional and subregional programmes and projects, training, maintenance and management projects, as well as projects for landlocked countries.

As time went on, other more ambitious approaches were taken into account, leading ultimately to a programme in which national projects became an overriding concern.

1.5.1 Analysis of programme under Phase I

After identifying all the projects likely to be undertaken during the subsequent years, ECA submitted programme proposals to the Conference of African Ministers of Transport, Communication and Planning meeting in Addis Ababa from 9 to 12 May 1979. The Conference made some amendments to the proposals and adopted, in addition to the projects submitted, operations identified by some countries themselves. 32 projects were included in the first phase programme. The projects were classified in their order of importance.

1.5.2 Resources mobilization

The first step in this direction was a request for international aid through the convening in New York in November 1979 of a Pledging Conference by the United Nations Secretary-General. Assessment of the results of that conference showed that the method used was not an effective way of looking for funds. Subsequently several meetings were organized in the various subregions. Of these meetings, only one, the first, which was attended by the 16 West African countries, discussed telecommunication problems. These meetings proved to be more effective in resource mobilization.

The financial resources mobilized for the implementation of projects included in the programme of the first phase amounted to 153,590,000 dollars, representing 22.70% of the funding required.

The share of the funding provided by African governments amounted to US\$43,090,000 representing 28.05% of the funding secured.

1.5.3 Analysis of programme under Phase II

The second phase covers the period 1984-1988.

The most difficult task during the second phase was the identification of projects which governments would like to execute during the period. Besides, projects which could not be implemented during the first phase had to be transferred to the second phase. After the new projects and projects transferred from the first to the second phase had been put together, the overall programme of the telecommunication sector comprised 828 projects broken down as follows: 375 new projects, 253 projects transferred from the first phase to the second phase. Following the consideration of the draft programme of the second phase submitted to it, the third Conference of African Ministers of Transport, Communications and Planning held in Cairo in March 1983 defined the following guidelines for the preparation of the revised draft programme:

- (a) Ongoing projects should be continued and included in the programme of the second phase;
- (b) Projects with feasibility studies, and included in the national plans as well as of relevance to the global objectives should be included in the programme;
- (c) Projects without feasibility studies should generally be excluded; care should nevertheless be taken to ensure that projects of relevance to the Decade global objectives are systematically excluded;
- (d) A project not included in the national plan of the country submitting it shall not be included in the programme;
- (e) Projects still at the conception stage shall not be included either;
- (f) Strong emphasis should be placed on regional and subregional projects and national projects of land-locked countries;
- (g) There must be effective co-ordination and integration of the various modes of transport;
- (h) Strong emphasis should be placed on maintenance and the preservation of existing assets;
- (i) There should be a clear indication of the extent of local and foreign financing.

Following the amendments proposed by some member States, taking into account resolution ECA/UNTACDA/Res. 83/23, the recommendations of the Paris Round Table, as well as the subsequent amendments made to the reused draft

programme of the second phase presented to the fourth Conference of African Ministers of Transport, Communications and Planning held in Conakry in February 1984, the draft programme presented by the ECA and the Interagency Co-ordinating Committee for the Decade, as a substitute for the revised programme, was adopted.

As far as the communication sector was concerned, the programme of the second phase comprised 472 projects, 216 of which related to the telecommunications sub-sector.

The estimated cost of the 216 projects (76 of which are projects under the first phase) of the second phase amounted to US\$2,696,870,000.

1.5.4 Resource mobilization

The classification of projects according to their nature somewhat facilitated the decisions by the donors to invest.

A round table on the integrated approach to the preparation and implementation of United Nations Transport and Communications Decade in Africa was held in Paris from 21 to 24 June 1983 to collect the views of experts and prepare the ground for increased mobilization of financial resources for the implementation of the second phase programme. Participants of the round table urged the international community to participate more actively than during the first phase in the financing of the second phase programme. The resources mobilized amounted to US\$461,520,000, representing 17.32% of the total estimates. The share of the African governments amounted to US\$86,140,000, representing 3.27% of the total amount needed for the programme and 18.91% of the financing secured.

1.5.5 Priorities

The priorities approved for the two phases of the Decade are different.

1.5.5.1 Priorities of the first phase

Document E/CN/TRANS/147 on the global strategy of the Decade gives the following classification of the priorities approved for the first phase:

- (a) I Regional projects
- II Subregional projects
- III National projects with regional or subregional implications;
- (b) Projects for the least developed, land-locked, newly independent, island and frontline countries;
- (c) Projects of concern to other countries.

52 of the projects included in the first phase were top priority projects, that is to say regional, subregional and national projects with subregional implication, commensurate with such common needs as construction of

international communications links (including project No. TEP-01 relating to the construction of the PANAFTEL network which covers the whole of Africa), the creation of regional centres and the study on the establishment of an African Regional Satellite Communications System. The other projects were submitted by governments and related to the improvement and/or expansion of national capacity in the field of telecommunications. The projects were mainly concerned with the purchase and installation of new switching equipment, the establishment of training facilities and the improvement of personnel training.

1.5.5.2 Priorities of the second phase

The priorities of the second phase were modified in the light of the experiences acquired during the first phase, the amendments presented by some member States, resolution ECA/UNTACDA/Res. 83/23, the recommendations of the Paris Round Table and the amendments made to the draft revised programme of the second phase by the fourth Conference of the Decade Ministers held in Conakry in February 1983. The projects were grouped according to nature into 5 functional categories:

1. Maintenance and rehabilitation;
2. Training;
3. Technical assistance;
4. Other regional, subregional and national projects with regional or subregional implications;
5. Other national projects.

15 projects of the second phase were top priority projects, that is maintenance and rehabilitation projects, 22 related to training and 5 were concerned with technical assistance. 75 were regional projects and 99 were national projects.

CHAPTER II

ROLE OF THE MAJOR FACTORS IN THE IMPLEMENTATION OF THE DECADE

2.1 Role of ECA

ECA, as the lead agency for the Decade, was assigned the following responsibilities (see Global Strategy, para III):

- (a) Co-ordination and implementation of the preparatory activities for the elaboration and finalization of the strategy and work programme of the Decade;
- (b) Co-ordination and monitoring of the planning and elaboration of the individual projects without the Decade programme;
- (c) Assisting the Secretary-General of the United Nations in the mobilization of resources for the implementation of the Decade programme;
- (d) Monitoring and evaluation of the actual implementation of these projects by designated "executing" agencies both within and outside the United Nations system;
- (e) Reporting on an annual basis to the United Nations General Assembly through the Economic and Social Council, on the progress of the implementation of the Decade programme.

The responsibility for the implementation of the programme devolved upon the Transport, Communications and Tourism Division of ECA. A Decade Co-ordinating Unit was set up within the Division with extrabudgetary financing from UNDP. The Decade Co-ordinating Unit is composed of six professional posts including three expert posts financed from bilateral sources (2 railway experts provided by France and a telecommunications expert provided by the FRG). ECA repeatedly and with increasing frequency towards the end of the first phase of the Decade, stressed the fact that the resources made available to it by the international community were insufficient. The situation later improved considerably thanks to UNDP contributions. In addition to its role as lead agency, ECA also played, among others, the role of co-ordinator of activities. In that capacity, it had to gather information from governments of African countries as well as the appropriate institutions. Unfortunately, despite all the efforts deployed by ECA ranging from preparation of questionnaires, appointment of officers to liaise with the ECA secretariat, use of the network of UNDP resident representatives, to field missions, the results were **disappointing**. The major problem faced by ECA was the difficulties encountered by many African Governments in providing information on project execution. In such circumstances, the responsibilities of co-ordinating, monitoring and planning of projects (these responsibilities were spelled out in point b of the tasks assigned to ECA by the United Nations) obviously could not be fully carried out by ECA. This "primary" role assigned to ECA clearly implied the involvement of the Executive Secretariat in the planning and

elaboration of all the Decade projects. Such a prerogative also conferred on it a very important role involving project analysis and approval, negotiations with governments and financial institutions, and arbitration, constantly keeping in mind the priorities of the global strategy. After facing numerous problems in implementing the first phase programme due mainly to lack of clarity in its mandate and the ambiguous nature of the projects submitted by governments and which were all accepted despite their irrelevance to the Decade objectives, ECA reacted by presenting for the second phase on "alternative programme" much more relevant to the Decade objectives. The disappointing experience of the first phase from the point of view of project implementation made it possible to have a better grasp of the problems by defining among other things, more coherent and more relevant priorities.

A global appraisal of the results achieved during the Decade shows that much remains to be done as far as the telecommunication sub-sector is concerned. The mobilization of resources for the financing of regional and subregional projects which constitute the *raison d'être* of the Decade has been disappointing. ECA as the agency responsible for the mobilization of funds for project financing participated in two meetings with donors held in New York and Paris, as well as technical consultative meetings. However, despite all those efforts, projects that were financed were mostly national projects. Another very important role which ECA had to play and should continue to play was to sensitize top planning officials and African leaders to the importance of telecommunication as a decisive factor in economic development. Even though all efforts made to mobilize funds fell below expectations, ECA's role as co-ordinator made it possible to implement and test co-operation mechanisms for the gradual integration of African countries in the field of transport and communications.

2.2 Role of UNDP

UNDP has contributed substantially to the achievement of the objectives and the execution of the activities of the Decade, both by co-operating with ECA and by financing specific pre-investment and technical assistance projects. UNDP is the major donor as far as the implementation of the Decade is concerned. Long before the proclamation of the Decade, UNDP supported the establishment of PANAFTEL and financed pre-investment studies on the network. It also financed regional projects RAF/73/023 (establishment of the PANAFTEL network), RAF/82/060 which is the continuation of the former and RAF/80/018 (relating to maintenance of the network). It is in the process of financing the next stage, that is the third phase of the project (operation and extension of the network for the period 1987-1991). It directly supported the co-ordinating activities of ECA by taking over the funding of the Co-ordinating Unit within the Transport, Communications and Tourism Division of ECA and by assuming the costs of the multi-agency studies which culminated in the elaboration of the global strategy and the first phase programme. As part of its second regional programme for Africa (1982-1986), it approved a sum of US\$3.5 million for the promotion and co-ordination of the activities of the Decade. In addition, a sum of US\$1.315 million from special programme resources was approved for the continued support of Decade activities. This last amount was the result of successive reductions on account of the financial difficulties

facing UNDP. That notwithstanding, UNDP naturally supplied the bulk of the funds enabling ECA to set up the planning and co-ordinating unit for the Decade. The funds provided to the ECA by UNDP to enable it carry out its responsibilities in the implementation of the Decade programme are admittedly substantial, but inadequate, given the magnitude of the tasks involved. Besides, UNDP is the only donor to finance regional projects and earmark funds for the financing of telecommunications projects. These projects are mainly concerned with studies, training and setting up of co-ordinating structures for the establishment of the PANAFTEL network. UNDP also financed various planning, training and feasibility projects in different African countries. UNDP is also one of the major contributors to RASCOM project feasibility studies.

2.3 Role of OAU

OAU took an active part in the promotion of the communications sector after realizing its importance in the economic development process. It has supported the Decade since its inception and strengthened it with the adoption in 1980 of the Lagos Plan of Action which is the demonstration of the political will of the African Heads of State to "take urgent action to provide the political support necessary for the success of the measures to achieve the goals of rapid self-reliance and self-sustaining development and economic growth". The Lagos Plan of Action stipulates, among other things, : "More particularly, we commit ourselves, individually and collectively, on behalf of our governments and peoples to: (d) implement completely the programmes for the United Nations Transport and Communications Decade for Africa". OAU is an active member of the Interagency Co-ordinating Committee responsible for the co-ordination and monitoring of the implementation of the Decade programme under the aegis of the ECA.

2.4 Role of PATU

PATU is a specialized agency of the OAU responsible for the promotion and development of telecommunications in Africa. As such, PATU had an important role to play vis-a-vis ECA and ITU in the implementation of the Decade objectives. Through the conferences, seminars and meetings it organized or in which it participated, PATU served as a forum for promoting co-operation of telecommunication administrations among African countries.

As a continental telecommunication organization, PATU has an important role to play in the establishment of regional inter-connection links, the diversification of transmission systems, the harmonization of tariff systems, the application of solutions to specific problems facing its members and the development of inter-African co-operation. However, PATU is suffering from lack of material and human resources.

2.5 Role of ITU

ITU is a United Nations specialized agency in the field of telecommunications. As such, its basic role is, among other things, to promote and develop telecommunications in the world. Long before the Decade, ITU

was very much interested in the state of telecommunications in Africa and its development. Together with ECA and UNDP, ITU is the promoter of the PANAFTEL project, of which it is the technical co-ordinator. Naturally, after the proclamation of the Decade, that project was incorporated into the Decade programme and became the basic project as far as the telecommunication sub-sector was concerned. Indeed, PANAFTEL covers all fields of telecommunication and is eager to integrate the networks of all African countries into a single automatic network making it possible for any subscriber of any African country to communicate with another subscriber of any African country without having to pass through transit centres outside Africa. To attain this objective, ITU which is the technical conceiver, implemented, in co-operation with ECA and UNDP, important projects including RAF/73/023, RAF/80/060, RAF/80/018 and RASCOM. ITU also co-operates with various telecommunication administrations by providing assistance in specific fields as well as training.

2.6 Role of ADB

ADB which was established to help in the development of Africa had a primary role to play in the mobilization of the funds needed for the implementation of the Decade programme. In that capacity, ADB is a member of the Decade Interagency Co-ordinating Committee. Telecommunication features prominently among the projects financed by ADB. From its inception up to the end of 1985, ADB has financed 21 telecommunication projects in 21 African countries to the tune of US\$254,020,000. Its intervention in telecommunication activities during that period accounted for 7% of the cumulative commitments of its regular resources and about 4% of the total cumulative commitments of the Bank. ADB can also finance telecommunication projects from the resources of the African Development Fund which it manages in favour of the least developed countries, more particularly in the rural areas.

Favourable conditions for the least developed countries should have been exploited much more thoroughly to improve the results achieved in the implementation of the Decade programme as far as the telecommunication sub-sector is concerned.

ADB financed part of project SAP-001 relating to feasibility study on the African Regional Satellite Communications System (RASCOM). ADB has always shown some readiness to finance telecommunication projects.

2.7 Role of subregional organizations

Subregional organizations have an important role to play in the implementation of the Decade programme. Following the insignificant result of the first meeting of donors convened in New York in 1979 by the United Nations Secretary-General and the 1983 Paris Round Table, ECA tried to organize subregional technical consultative meetings which proved more successful. Generally, donors were made to recognize the importance of these meetings and the need to support projects. Only the first meeting which brought together the 16 ECOWAS countries and the donors discussed communications and, more particularly, telecommunications. ECOWAS attaches great importance to telecommunications and set up a project co-ordinating and implementation unit.

It also created a development fund for project financing. The Preferential Trade Area for Eastern and Southern Africa also played an important role in the implementation of telecommunication projects in that subregion whose telecommunication network is practically integrated. UDEAC has so far achieved little success, but it is hoped that it will be more successful in future. Other subregional organizations such as the Southern African Development Conference, the Mano River Union, the Economic Community of the Great Lake States, the Organization for the Development of the River Senegal, etc. are all viable frameworks for the development of telecommunications. These subregional organizations could at least have helped to achieve the Decade objective relating to PANAFTEL, that is the automatic link between all African countries without transiting through a foreign country, if they had succeeded in setting up adequate structures.

2.8 Role of African governments

Undoubtedly, African governments have specific responsibilities vis a vis the Decade. In the Global Strategy for the Decade (E/CN.14/726, E/CN.14/TRANS/147), it is stated that the principal goal of the strategy must be independence, self-reliance and international co-operation among African countries in the field of transport and communications. In that connection, co-ordination and follow-up mechanisms were set up at national, subregional and regional levels. Councils of MULPOC Ministers were instituted at subregional level and biennial meetings of Ministers of Transport, Communications and Planning at regional level. At national level, each country was invited to appoint a co-ordinator to co-ordinate Decade activities at national level and to liaise with ECA.

The co-ordination mechanisms at national level were ineffective and ECA always had serious difficulties in obtaining information on the actual implementation of projects. That made the co-ordination task of the ECA almost impossible.

Very often regional and subregional projects are conceived in a concerted manner but in most cases governments do not commit themselves to see them implemented. And so long as regional projects are not implemented, the development objectives set by the Decade cannot be achieved.

CHAPTER III

RESULTS OF THE DECADE PROGRAMME

3.1 Analysis of the implementation of the programmes under the first and second phases of the Decade

Analysis of the Decade results is no easy task, more so as adequate data are not always available and many governments are not in a position to provide reliable data on the implementation of projects in their countries. Missions undertaken to three African countries have confirmed these difficulties. The following analysis was made on the basis of the data currently available.

3.1.1 Analysis of the implementation of the first phase programme

Analysis of the results of the first phase will be done on the basis of data currently available.

3.1.1.1 Results by nature

Investments relating to new infrastructures and rehabilitation amounted to US\$148,850,000, representing 97.15% of the total.

Training mobilized US\$840,000, representing 0.55%, feasibility studies US\$2,280,000, corresponding to 1.49% and the establishment of co-operation bodies US\$1,500,000, corresponding to 0.81%. The following table gives the breakdown of investments by nature:

Intervention	Number of projects	Estimated Cost in mill. \$	Financing in Mls.of Dollars	Percentage implemented	Overall Financing Percentage
Investments Infrastructures	57	456.81	148.59	32.52	96.74
Training and Conference	10	3.75	0.71	22.4	0.55
Feasibility studies	20	209.96	2.48	1.18	1.61
Establishment of Co-operation bodes	6	5.85	1.68	25.64	1
TOTAL	92	676.55	153.59	22.70	100

3.1.1.2 Results according to priority

The following table shows the breakdown of funds according to priority.

Breakdown of funds according to priority

Priority	Number of Projects	Estimated Cost in Mls \$	Financing Obtained in Mls \$	Implement-ation per centage	Overall Financing Percentage
1. Regional and subregional projects	32	97.23	34.02	34.98	22.15
2. Least Developed countries	24	363.05	15.95	4.40	10.38
3. Other National projects	36	216.27	103.62	47.91	67.47
TOTAL	92	676.55	153.21	22.70	100

Analysis of these results clearly shows the gap between the Decade objectives and the financial choices of governments and donors. In fact, as can be seen, 64.47% of the resources mobilized were allocated to other national projects, whereas regional and subregional projects, as well as projects in favour of the least developed countries received only 22.15% and 10% respectively. Difficulties encountered in the financing of regional and subregional projects which are in fact the raison d'être of the Decade are due to the reticence of funding institutions. This is because these projects have no sufficient guarantee. However, funding would be easy to get if the projects were sponsored by autonomous self-financing enterprises and/or enterprises with their own accounts or which have been given grants.

It is especially when a project has distinct national components or when it falls under a company with intergovernmental participation without a budget that the funding sources are most reticent. With regard to the least developed countries, the 10.38% result is low.

3.1.2 Analysis of the results of the second phase

Analysis of the results of the second phase proved as difficult as that of the first phase.

3.1.2.1 Financing of projects by priority

The priorities of the second phase are classified according to nature. Classifications according to nature and priority are thus identical.

The following table gives the breakdown of funds by nature and priority.

Breakdown of funds by nature and priority

	Number of projects	External funding in millions of US\$	Local funding in millions of US\$	Total in millions of US\$
Rehabilitation and maintenance	15	21	0.54	21.54
Training	22			
Technical assistance	5	6		6
Other regional projects	75	173.25	57.3	230.36
Other national projects	99	174.62	28.74	203.36
Total	216	374.87	86.58	461.26

1. Rehabilitation and maintenance projects

This category includes projects which contain components of maintenance and/or rehabilitation of existing infrastructure/service. There are all together 15 projects estimated at US\$1,002,200,000 in 1981 and US\$1,164,200,000 in 1987. Only one of those 15 projects is regional - project No. TEP 60-012 entitled: "Operations and maintenance: studies and courses for senior staff". No financing has been secured for this project. Funding has been secured for only two projects:

Project No. TEP-11-006 submitted by Congo: Extension and rehabilitation of urban telephone networks and exchanges. Total external funding secured for this project amounted to US\$21,000,000.

Project No. 18-001 submitted by Ghana: Rehabilitation of Takoradi and Tema coast radio station. Partial external funding to the tune of US\$540,000 has been secured for this project. Total financing of this category of project amounted to US\$21,540,000, representing 18.50% of the funds needed to finance the overall maintenance and rehabilitation programme. There are still 13 projects out of the 15 included in the programme for which funding is to be sought.

2. Training projects

The telecommunication sub-sector comprises 22 projects, 20 of which are regional or subregional and two are national. The projects are mainly concerned with the establishment of institutions for the training of technicians at basic and medium levels and for training in new and specialized technologies such as in satellite communications and rural telecommunications. A number of seminars and workshops relating to operations and maintenance techniques and management is also provided for. Opportunities for acquisition of other skills are also provided for under regional projects such as establishment of a staff exchange programme and preparation of a regional telecommunications manpower directory. The estimated cost of these projects is US\$164,800,000.

To date, none of the 22 projects has attracted external funding.

3. Technical assistance projects

There are five technical assistance projects and all are regional. Four of these projects are concerned with provision of assistance and expertise in establishment of maintenance procedures, development planning and management techniques. The fifth is concerned with a feasibility study on a Regional African Satellite Communication System.

The total cost of the projects in this group was originally estimated at US\$9,600,000. This figure has been up-dated and now stands at US\$12,100,000. None of these projects has so far attracted any external funding, except project SAP-60-001 relating to the feasibility study on a Regional African Satellite Communications System (RASCOM) which was fully financed to the tune of US\$6,000,000.

4. Other regional, subregional and national projects with subregional implications

These are projects which cannot be grouped with any of the three preceding groups. The total estimated cost of these projects amounted to US\$503,000,000. This figure has been up-dated and now stands at US\$533,000,000. Of this, US\$127,270,000 has been secured from external sources and US\$62,820,000 from local sources. On the whole, the funds mobilized represent 35.66% of the resources required.

TABLE 4
LIST OF PROJECTS FINANCED

Number	Project	External Funding in million Dollars	Local Funding in million Dollars	Total Funding secured in Mil.Dol.
TEP-11-004	Congo: Extension of the earth station at Moungouni		0.64	0.64
TEP-13-001	Egypt: Construction of Aswan Halfa (Sudan) microwave		20	20
TEP-18-007	Ghana: Accra-Bolgatanga microwave link	24	3.90	27.90
TEP-19-001	Guinea: Establishment of an international transit network centre	2.55	0.22	2.77
TEP-19-009	Guinea: Extension of standard B earth station		2 2	2 2
TEP-31-001	Morocco: Establishment of five coastal stations		1.10	
TEP-34-002	Nigeria: Installation of Enugu Satellite earth station		24.32	24.32
TEP-35-001	Rwanda: International microwave link Mt Dari- Ngara (Tanzania)	0.20		0.20
TEP-35-002	Rwanda: International microwave link (Yongu- Bukava)	0.16		0.16
TEP-35-003	Rwanda: International Link Kigali-Bujumbura (Burundi)		2.35	2.35

LIST OF PROJECTS FINANCED (Contd.)

Number	Project	External Funding in million Dollars	Local Funding in million Dollars	Total Funding secured in Mil.Dol.
TEP-39-002	Sierra Leone: Telecommunication satellite earth station Standard A	6		6
TEP-41-005	Sudan: Upgrading UMM international earth station	1		1
TEP-42-001	Swaziland: Provision of four wire tank taransit switching exchanges	4.40	1.50	5.90
TEP-43-001	Tanzania: Microwave link with Burundi and Uganda	2		2
TEP-43-003	Tanzania: Microwave link with Malawi Tanzania- Malawi		2.40	
TEP-44-011	Togo: International telephone transit centre	2		2
TEP-47-004	Burkina Faso: Microwave transmission link between Fada-N'gourma and Natetingon (Benin)	0.72	0.19	0.91
TEP-49-001	Zambia: Eension of Satellite earth Station	15.80	5	20.80
TEP-50-001	Zimbabwe: Installation of a Standard A earth station	1.50	14.40	
TEP-60-001	Implementation of PANAFTEL project	43.84		43.84

LIST OF PROJECTS FINANCED (Contd.)

Number	Project	External	Local	Total
		Funding in million Dollars	Funding in million Dollars	Funding secured in Mil.Dol.
TEP-60-016	East Africa (Including island countries) submarine cable link and possible link-up to the Pacific Ocean system	0.30		0.30
TEP-60-018	Establishment of a laboratory for the repair and calibration of measuring equipment		0.20	0.20
TEP-60-020	United Republic of Tanzania Uganda PANAFTEL link	9	9	9
TOTAL		127.270	62.82	190.09

5. Other national projects

This category comprises national projects which cannot be grouped with regional or subregional rehabilitation and maintenance, training or technical assistance projects. There are 99 such projects, estimated to cost US\$1,912,300,000 (1981), that is 71% of the total cost of the sub-sectoral telecommunication programme. This figure has been up-dated and now stands at US\$1,994,600,000. This category of project, though in the fifth position by order of priority, accounts for over 2/3 of the second phase programme. The table below gives the list of projects financed as the up-dated cost:

LIST OF PROJECTS FINANCED AT UPDATED COST

Number	Project	External Funding in million Dollars	Local Funding in million Dollars	Total Funding secured in Mil.Dol.
TEP-05-002/003	Burundi: Extension of exchanges by 1,000 lines Extension of national network by 200 circuits	3		3
TEP-05-005	Burundi: Extension of rural network		1	1.50
TEP-05-006	Burundi: Extension of local cable networks by 8,000 pairs	6.50		6.50
TEP-05-007	Burundi: Installation of twelve new telephone exchanges in the interior of the country	3.50	0.20	3.70
TEP-07-001	Cape Verde: Extension of telecommunications services of the rural communities	0.55		0.55

LIST OF PROJECTS FINANCED AT UPDATED COST

Number	Project	External Funding in million Dollars	Local Funding in million Dollars	Total Funding secured in Mil.Dol.
TEP-08-005	Central African Republic: Modernization and extension of Bangui telephone network	3.53		3.53
TEP-11-007	Congo: Realignment of the Brazzaville-Pointe Noire coaxial cable		1	1
TEP-12-003	Djibouti: Balbala telephone exchange	3	0.14	3.14
TEP-15-001	Ethiopia: Rural sub- scriber radio system	0.65	0.25	0.90
TEP-15-002	Ethiopia: Jijiga - Gode troposcatter link	0.54	0.16	0.70
TEP-15-003	Ethiopia: Extension of automatic exchange	1.50	0.25	1.75
TEP-15-004	Ethiopia: Gore-Gambela medium-capacity UHF system	0.40	0.10	0.50
TEP-15-005	Ethiopia: Gondar-Humera troposcatter link	0.54	0.16	0.70
TEP-16-003	Gabon: Extension of the telecommunications net- work (North east axis)		16	16
TEP-17-001	Gambia: National Trunk switching centre, Banjul	0.78		0.78
TEP-22-001	Kenya: Rural tele- communication project	5.30	1	6.30
TEP-27-004	Malawi: Telegraph and telex equipment	12		12

LIST OF PROJECTS FINANCED AT UPDATED COST (Contd.)

Number	Project	External Funding in million Dollars	Local Funding in million Dollars	Total Funding secured in Mil.Dol.
TEP-27-005	Malawi: Development of small telephone network	5.50		5.50
TEP-29-001	Mauritania: Telecommunication development programme	12		12
TEP-35-004	Rwanda: Expansion of the capacity of interurban microwave link	2.53		2.53
TEP-35-006	Rwanda: Expansion of CT3, CTN and local telephone exchanges	8.35		8.36
TEP-37-009	Senegal: Automation of the Casamance and Senegal Eastern telephone networks	1		1
TEP-37-021	Senegal: West African Cable factory	12.58	2.52	15.10
TEP-41-007	Sudan: Capacity extension and rehabilitation of the microwave backbone network	7.50		7.50
TEP-42-002	Swaziland: Extension of the Mbabane automatic telephone exchange	2.40	3.80	6.20
TEP-42-003	Swaziland: Extension to rural automatic tele- phone exchanges	0.80	0.30	1.10
TEP-42-004	Swaziland: Extension of the national radio trunk network	3.80	1.40	5.20

LIST OF PROJECTS FINANCED AT UPDATED COST (Contd.)

Number	Project	External Funding in million Dollars	Local Funding in million Dollars	Total Funding secured in Mil.Dol.
TEP-44-003/005	Togo: Modernization and extension of the underground network of eight towns in provinces increase in the capacity of telephone exchanges in six major towns	18.60		18.60
TEP-46-001	Uganda: Development of rural telecommunications	48.74	0.02	48.76
TEP-46-003	Uganda: Liaison Kampala-Masaka-Mbaraba radio relay link	4.30		4.30
TEP-47-001	Burkina Faso: Introduction of automatic telephone system in five towns	2.10		2.10
TEP-47-002	Burkina Faso: Construction of an automatic telephone exchange and its associated local network at PO	0.66		0.66
TEP-47-003	Burkina Faso: Provision of local exchange equipment	0.05	0.1	0.06
TEP-47-005	Burkina Faso: Extension of the telephone exchange and local network of Fada, N'gourma		0.51	0.51
TEP-49-002	Zambia: Radio monitoring station		0.20 0.20	0.20 0.20
TOTAL		173.21	29.02	202.23

As can be seen, the total resources mobilized amounted to US\$202,230,000, US\$173,210,000 from the external sources and US\$29,020,000 from the local sources. The implementation percentage is about 10%.

Financing of projects by priority produced the following results:

- Rehabilitation and maintenance received US\$21,540,000, representing 4.67% of the total financing secured.
- Training received no financing.
- Technical assistance received US\$6,000,000, representing 1.30% of the total financing secured.
- Other regional projects received US\$228,820,000, representing 49.58% of the total financing secured.
- Other national projects received US\$205,160,000, representing 44.45% of the total financing obtained.

Here also, it can be seen that the priorities have not been respected. National and regional projects had taken almost the totality of the financing obtained, i.e. 94.03%, 44.45% for national projects and 49.58% for regional projects. The reasons for the non-compliance with the priorities mainly stemmed from the fact that almost all the investments made related to new infrastructures.

3.2 Relationship between the objectives and the strategy of the first and second phases

The results of the two phases of the Decade programme are given hereunder.

3.2.1 Results of the programme of the first phase according to objective

The results of the programme of the first phase according to objective are given in the following table:

TABLE SHOWING RESULTS ACHIEVED UNDER THE FIRST PHASE OBJECTIVE BY OBJECTIVE

Objectives	Number of projects	Estimated cost in millions of \$	Financing obtained in millions of \$	Project imple- mentation percentage	Percentage of financing obtained
National networks	40	345.35	115.71	25.26	75.52
PANAFTEL	13	95.76	28.54	29.80	18.62
Operation and maintenance	4	104.65	6.50	6.21	4.24
Training	4	1.27	0.71	55.90	0.46
Management	10	6.77	0.71	10.48	0.46
Planning	12	3.82	1.02	27.22	0.7
Rural Telecommunications	8	115.93	0	0	0
Telecommunication industries	1	3	0	0	0
TOTAL	92	676.55	153.21	22.70	100

The results achieved during the first phase are as follows:

- National networks - Financing obtained: 75.52%; results achieved: 25.26%
- Operation and maintenance - Financing obtained: 4.24%; results achieved: 6.21%
- Training - Financing obtained: 0.46%; results achieved: 55.90%
- Management - Financing obtained: 0.46%; results achieved: 10.18%
- Planning - Financing obtained: 0.7%, results achieved: 27.22%.

Rural telecommunications and telecommunication industries obtained no financing during the first phase.

As can be seen, the lion's share of the financing obtained went to national networks, followed by PANAFTEL, 18.62%, operation and maintenance, 4.24%, planning, 0.70% training and management 0.46%

3.2.2 Results of the programme of the second phase objective by objective

The results of the programme under Phase II are given in the table below:

TABLE OF THE RESULTS OF PHASE II ACCORDING TO OBJECTIVE

Objective funding obtained	Number of projects	Estimated cost in millions of \$	Funding in millions of \$	Project implementation percentage	
National network	92	original 1704.95	143.51	7.53	31.09
PANAFTEL	59	original 496.65	237.60	47.84	51.48
Operation and maintenance	5	original 114.65	0.20	1.95	0.04
Training	19	original 163.92	0	0	0
Management	7	original 4.62	0	0	0
Planning	14	original 15.25	6	39.34	1.30
Rural telecommunications	19	original 94.41	59.11	62.60	12.80
Telecommunication industries	1	revised 15.10	15.10	100	3.29
ORIGINAL TOTAL	216	original 2009.55	461.52	17.11	100

The most significant funding secured in favour of PANAFTEL stands at US\$237,600,000, representing 51.48% of the total financing obtained; followed by national networks 31.09%, rural telecommunication 12.80%, telecommunication industries 3.29%, operation and maintenance 0.04%, training 0% and management 0%. Each country tried first and foremost to look for funding for its own projects.

3.3 Relationship between the objectives attained and the strategy of programmes approved under the first and second phases

The above assessment of project implementation objective by objective has revealed that despite the undeniable progress made in the telecommunication sub-sector, no objective has been fully achieved at continental level. Table six below gives the classification of the Decade projects according to objective.

CLASSIFICATION OF PROJECTS OF THE WHOLE DECADE
ACCORDING TO OBJECTIVE

Objective	Number of projects	Estimated cost	Funding obtained	Implementation percentage
1. National networks	93	2.02	259.22	12.83
2. PANAFTEL	60	537.94	266.14	49.47
3. Operation and maintenance	5	135.32	-.70	4.95
4. Training	23	164.999	0.71	6.23
5. Management	13	11.39	0.71	6.23
6. Planning	17	18.79	7.04	37.46
7. Rural tele- communications	19	171.32	59.11	34.50
8. Industry	2	18.10	15.10	83.42
TOTAL	232	3,077.86	615.11	19.21

3.3.1 Development of national networks (1 telephone per 100 inhabitants and 14% annual growth rate). There have been various levels of progress with respect to telephone networks in Africa. However, the objective of 1 telephone per 100 inhabitants will probably not be attained at the end of the Decade. As at 1 January 1987, telephone penetration was 0.65% as against 0.4% in 1978. Telephone growth of African countries South of the Sahara has generally been in the region of 12% during the Decade (see table in the Annex).

The strategy for the attainment of the objective referred to above required, in the main, national projects relating to rehabilitation and extension of national telephone exchanges. The programmes of the first and second phases comprise in all 93 projects estimated at US\$2,030,000,000. 43 of these projects, representing 40.50% of the total number, to which has been allocated US\$258,220,000, i.e. 12.83% of the total funds obtained, were implemented or are about to be implemented. The projects which were financed were:

TEP: 25; - 40; - 66; - 84; - 85; - 05-02; 05-003; - 07 - 001; - 08 - 005; - 11 - 006; - 12 - 003; - 15 - 001; - 16 - 003; - 17 - 001; - 27 - 005; - 29 - 001; - 35 - 006; - 37 - 009; - 42 - 002; - 42 - 003; - 44 - 003; - 44 - 005; - 46 - 001; - 47 - 001; - 47 - 002; - 49 - 002

It can be seen therefore that a significant portion, about 92.28% of projects approved for the Decade and which were included in the strategy for the attainment of national networks development objective, has not been implemented.

The implementation of all the above-mentioned projects included in the Decade would have made it possible to achieve the objective set. However, it should be pointed out that no in-depth planning study which would have made the attainment of the objective possible was carried out on the projects before their inclusion in the Decade programme.

3.3.2 PANAFTEL

The objective of PANAFTEL, as indicated in paragraphs 1.3.2 and 1.4.2 is to constitute a single integrated and automatic telecommunications network for the whole continent.

Analysis made in paragraph 1.4.2 has revealed that that objective has not been achieved and will not be at the end of the Decade.

The programmes of the first and second phases comprise in all 60 projects relating to the attainment of the objective referred to above and are estimated to cost US\$537,940,000. The total number of projects financed is 33, estimated at US\$266,140,000, i.e. 47.64%. These projects were implemented or are about to be implemented. They are:

TEP: - 26; - 29; 05-001; - 08 - 002; - 11 - 001; - 11 - 009; - 12 - 005; - 13 - 001; - 15 - 003; - 15 - 006; - 18 - 007; - 19 - 001; - 19 - 009; - 24 - 001; - 34 - 002; - 35 - 001; - 35 - 001; - 35 - 002; - 35 - 003; - 37 - 004; - 39 - 002; - 41 - 005; - 42 - 001; - 43 - 002; - 43 - 003; - 43 - 004; - 44 - 001; - 46 - 003; - 47 - 004; - 49 - 001; - 50 - 001; - 60 - 001; - 60 - 016; - 60 - 020

46.91% of the projects, estimated at US\$261, 750,000, i.e. 52.32% of the financing required, received no funding. As stated earlier with respect to national networks, good planning, that would have taken into account all the missing sections, the international transit centres in countries where there are is none or where they are not of adequate dimensions, the inter-connections of networks of neighbouring countries, transit and tariff problems at continental level and adequate financing would have made it possible to achieve the objective of PANAFTEL.

3.3.3 Operation and maintenance

This objective, as stated in paragraph 1.4.3 will not be attained at the end of the Decade.

The programmes of the first and second phases comprise in all 5 operation and maintenance projects estimated at US\$10,230,000. Partial funding was secured for only one project: TEP-60-018 to the tune of US\$6,700,000, representing 4.9% of the funding required. There remain 4 projects estimated at US\$10,030,000, representing 80% of the total financing required, for which no funding has been secured.

The operation and maintenance objective should have been a subject of careful planning aimed at ensuring for each of the African countries a sound maintenance policy based on the implementation of a national maintenance improvement plan prepared beforehand.

3.3.4 Training

Paragraph 1.4.4 of this report has already dealt with training problems. The programmes of the first and second phases comprise in all 23 training projects estimated at US\$164,999,000. Financing secured amounted to US\$710,000, representing 0.43% of the funding required.

Two projects of the first phase, viz TEP-15 and TEP-60 were implemented.

Good planning, backed by subregional and regional co-ordination at the level of ECA, would have made it possible to attain the training objective with greater success.

3.3.5 Management

The analysis made in paragraph 1.4.5 of this report has revealed that the management target has not been achieved and will not be at the end of the Decade.

The programmes of the first and second phases comprise in all 7 management projects estimated at US\$4,620,000. Financing obtained amounted to US\$710,000, representing 6.23% of the total financing required. Good planning backed by subregional and regional co-ordination at the level of the ECA would have made it possible to attain the management target.

3.3.6 Planning

The analysis made in paragraph 1.4.6 of this report has revealed that the planning target has not been achieved and will not be at the end of the Decade.

The programmes of the first and second phases comprise in all 17 planning projects estimated at US\$17,750,000. 4 of these projects obtained funding: the project for the African Satellite Communication System (RASCOS) which received funding amounting to US\$7,010,000 and 3 other projects of the first phase i.e. TEP-04; - 08; - 07. There remain 13 planning projects estimated at US\$11,750,000, representing 63.56% of the funding required for the attainment of the planning target. Like the preceding projects, these projects have not been the subject of any study and they do not have much immediate relevance to the objective to be attained during the Decade.

3.3.7 Rural telecommunication

The analysis made in paragraph 1.4.7 has revealed that the rural telecommunication target has not been attained and will not be at the end of the Decade.

The programmes of the first and second phases comprise 19 rural telecommunications projects estimated at US\$171,320,000. Six projects, representing 31.57% of the total number has received funding to the tune of US\$59,110,000, corresponding to 34.50% of the funding required.

The remaining 13 projects, corresponding to 68.43% of the total number and estimated at US\$112,210,000, i.e. 65.50% of the total funding required, have received no financing. The Decade objective in the field of rural telecommunications is one public telephone booth for 10,000 inhabitants. A programme based on effective planning would have made it possible to achieve the rural telecommunication objective.

3.3.8 Telecommunications industry

The analysis made in paragraph 1.4.8 of this report has shown that the Decade objective relating to the manufacture of telecommunications equipment will not be achieved at the end of the Decade.

Two projects submitted by Kenya and Senegal featured in the programmes of the first and second phases, estimated at US\$18,100,000. Only the project submitted by Senegal, i.e. TEP-37-021 relating to the establishment of a cable manufacturing factory for West Africa received funding to the tune of US\$15,100,000, representing 83.42% of the total financing required.

However, the 83.42% result does not mean that the target for a telecommunication industry is almost achieved. Far from it, for the needs identified in paragraph 1.3.8 are indeed colossal.

Here also, it should be acknowledged that good and serious planning and available financial resources would have made it possible to attain the objective set.

3.4 Proportion of achievements that can be directly or indirectly attributed to the Decade programme

Though the objectives could not be achieved, great progress was made, nonetheless.

1. National networks: Telephone penetration increased from about 0.4% in 1978 to about 0.70% in 1987.

2. PANAFTEL: The West, Southern and East Africa subregions have practically established all inter-State links except a few earth links. If transit and tariff agreements had been realised, the West Africa subregion could operate an integrated automatic telecommunication network. Southern and East African countries also have an integrated automatic network.

Central African countries on the other hand have not established many inter-State links. The only links that are operational are:

Congo - Zaire
Burundi - Zaire
Rwanda - Zaire
Cameroon - Gabon

All the other links are to be established. However, with regard to satellite links, if transit and tariff agreements had been realised, 8 of the 11 countries of the subregion could communicate among themselves with automatic devices.

There are no links among the subregions. In this respect as well, it will be possible to link up all the subregions by satellite provided that there are transit and tariff agreements among all African countries.

3. Operation and maintenance

The implementation of project ITU/UNDP/RAF 80/018 made it possible to improve significantly maintenance in all African countries. Maintenance/operation were set up everywhere. However, to attain the objective set, it will be necessary to implement in each of the African countries a national improvement and maintenance plan in respect of which exercise the project has prepared a guide.

As stated in paragraph 1.4.3, a few countries have prepared such a plan.

4. Training: Significant progress has been made in the field of training. Practically all African countries have a level 4 training centre. The basic training objective is about to be achieved. Level 3 is also satisfactory. Levels 2 and 1 are still inadequate.

The other specialized fields of training depend on the administrations and the possibilities offered.

5. Management: Management objectives include independence or autonomy of grouped telecommunications and maximum use of material, financial and human resources. Significant progress has been made but much remains to be done.

6. Planning: This objective concerns mainly the elaboration of a telecommunication master plan. Though all telecommunication administrations have planning units, very few however have a master plan. The existence and implementation of a master plan will enable each telecommunication administration to have a better mastery of planning.

7. Rural telecommunications

The objective of 1 public telephone booth per 10,000 inhabitants for all African countries is far from being achieved. Nevertheless, telecommunication administrations have become aware of the need to develop rural telecommunications. This objective will be achieved only with the implementation of the RASCOM project.

8. Telecommunication industries

This is the most difficult objective to achieve. Everything has to be done as far as this area is concerned.

The Decade programme has undoubtedly contributed a lot towards the results achieved in the field of telecommunications. Projects included in the two phase programme of the Decade are relevant to the objectives referred to above. Projects for which funding has been secured constitute the direct contribution of the Decade programme to achievements in the field of telecommunications.

However, the proclamation of the Transport and Communications Decade in 1977 aroused great interest in African governments and donors. Telecommunications received special attention and a degree of mobilization on the international plane. This led, among other things, to the establishment in Nairobi in 1982 of the ITU Conference of Plenipotentiaries, the Independent Telecommunications Development Commission also known as the Maitland Commission, the convening by ITU of the World Conference on Telecommunications Development in Arusha in 1985, at the end of which the Arusha Declaration was issued, and the establishment of an International Centre for the Development of Telecommunications with its headquarters in Geneva. Thus, since the proclamation of the Decade, the telecommunication sub-sector has received greater attention on the part of donors and African governments. It can be said therefore that the results achieved outside the Decade programme can be indirectly attributed to the latter.

232 projects in all were included in the programmes of the first and second phases. The estimated cost of these projects was US\$3,077,860,000. Funding obtained for the over all programme of the two phases amounted to US\$615,100,000, representing 10.4% of the estimates. This shows the low level of results achieved.

3.4.1. Total cost of projects included in the programmes of first and second phases

Table of costs of projects included in the first and second phase programmes.

COSTS OF PROJECTS INCLUDED IN THE PROGRAMMES OF
FIRST AND SECOND PHASES

Phase	Number of projects	Estimated cost in millions of \$	Funding obtained in millions of \$
I	92	initial 676.55	153.59
II	216	initial 2609.55	461.52
Projects transferred from the first phase to the second phase	76	447.607	
Total Decade projects	232	initial 3077.86	615.11

3.4.2. Funding sources for projects included in the programme

The following table gives the funding sources and their contributions:

<u>Funding sources</u>	<u>Contributions in millions of \$</u>
1. <u>Individual financing</u>	
PNUD	9.66
ITU	0.06
African Development Bank (ADB)	16.76
Norway (NORAD)	0.63
France (CCCE)	28.57
UNIDO	0.13
ECOWAS	2.68
IBRD	8.37
FRG	3.15
BADEAC	1.12
EDF	3
Italy	10.05
Sweden	1.25
Holland	0.54
Foreign Banks in Liberia	17
ACDI	18.15
USAID	1
FADES	8
UNESCO	0.05

(continued)

2. <u>Cofinancing</u>	<u>Contributions in</u> <u>millions of \$</u>
EDF/ECOWAS	
IBRD/Italy	6.50
IDA/Netherlands	6.50
ADB/BADEAC/OCPT	3.53
France/Holland/IBRD/OECF	5.30
IBRD/BOAD	1
BOAD/SIFIDA	12.58
France/Holland	7.50
NORAD/SIDA	2.40
ADB/BOAD/France/EIB	18.60
IDA/UNDP/France	48.74
ADB/CBK	9
ECA/ITU/OAU/ADB	0.10
UNDP/ITU	0.50
<hr/> TOTAL	<hr/> 470.32 <hr/>

As can be seen the funding sources are very diverse and have contributed a total of US\$470,320,000. Contributions from individual funding sources amounted to US\$221,010,000, representing 47% of external financing and the major contributors are France (US\$28,570,000), ACDI (US\$18,750,000) and ADB (US\$16,760,000). Co-financing amounted to US\$249,310,000, representing 53% of the financing secured. At the top of the list of the co-financing groups are: IDA/UNDP/France: US\$48,740,000, ADB/BOAD/France/EIB: US\$18,600,000 and BOAD/SIFIDA: US\$12,580,000

3.5 Evaluation of over all development of telecommunication in relation to the Decade objectives

The insignificant results achieved during the Decade do not reflect the real efforts made during the Decade period. Indeed, the results are much more important than is indicated in the evaluation of the Decade programme. Even if it is difficult to make a quantitative evaluation of all the results achieved during the Decade through the implementation of all the projects of the sub-sector included or otherwise in the Decade, some appraisal is still possible. Table 1 in Annex 1 and Table 7 in Annex 6 clearly show the evolution of some parameters in the various subregions.

3.5.1 Development of national networks

A. North Africa

The 5 North African countries are among the African countries which have the most developed telephone networks. The telephone penetration varied between 1.05 and 1.95 during the Decade. The telephone penetration has therefore practically doubled. The objective of 1 telephone per 100 inhabitants was achieved at the time of the take-off of the Decade. Each of the 5 countries achieved that objective in 1986. Morocco with 0.79% and Egypt 0.92% of telephone penetration at the beginning of the Decade, and 1.09% and 1.84% respectively in 1986, have already achieved the objective set before the end of the Decade. The growth rate of telephone lines is 13.70% for the entire subregion, a little less than the 14% objective set by the Decade. Egypt has witnessed the highest development during the Decade with 27.1%. The lowest development was achieved by Tunisia and Algeria with only 7%. No information is available on Libya which already had a relatively high penetration of 4.11% in 1978 and might have increased that percentage during the Decade.

B. West Africa

The West African subregion is one of the most undeveloped subregions as far as the development of national networks is concerned. At the time of the take-off of the Decade, the telephone penetration was 0.137% as against 0.4% for all the African countries. At the time, the countries with the lowest telephone penetration were Mali and Burkina Faso with 0.06% and Nigeria with 0.07%, while those with the highest penetration were Cape Verde, Liberia and Cote d'Ivoire with 0.55%, 0.40% and 0.38% respectively. In 1986, the telephone penetration for the entire subregion increased to 0.25%, that is a little less than twice the penetration in 1978. Only Cape Verde exceeded the 1% target, followed by Gambia with 0.85%, Guinea Bissau 0.78% and Cote d'Ivoire 0.66%. Burkina Faso and Mali are at the bottom with 0.09%. The growth rate of telephone lines was 12.6% in 1986 for the entire subregion compared to the 14% objective set by the Decade. Mauritania and Cape Verde have the highest growth rates with 25% and 15% respectively while Ghana has the lowest rate with 0.7%.

C. Central Africa

Central Africa is also a very underdeveloped subregion as far as the development of national networks is concerned. At the time of the take-off of the Decade in 1978, the telephone penetration for the entire subregion was 0.198%, almost half the penetration of the entire continent. Only Gabon exceeded the 1% target in 1978 with a 1.7% telephone penetration, followed by Sao Tome and Principe with 0.75%, Congo 0.53% and Angola 0.52%. Countries with the lowest penetration were Rwanda and Chad with 0.06%.

In 1986, the entire subregion had a penetration of 0.23%, less than West Africa and a little less than 1/3 of the telephone penetration of the whole of Africa which is 0.65%. Two countries, Sao Tome and Principe and Gabon

have exceeded the target with 1.85% and 1.66% respectively, followed by Congo and Angola with 0.56%. The telephone growth rate for the entire subregion was 4.44% between 1978 and 1986. It is the lowest growth rate of all the subregions. It is below the average growth rate of the continent which is 12.09%. Countries with the highest telephone growth rates are Sao Tome and Principe, 20% (above the Decade objective) and Gabon, 12.11% (below the objective). Congo had the lowest growth rate with 3.5%.

D. East and Southern Africa

At the time of the take-off of the Decade in 1978, the telephone penetration of the subregion was 0.271%, the highest after that of North Africa. Two countries, Seychelles and Mauritius had the highest telephone penetration with 4% and 2.19% respectively and therefore exceeded the target set, followed by Djibouti, Botswana and Swaziland with 0.78%, 0.77% and 0.74% respectively. Countries with the lowest penetration were the Comoros, Madagascar, Lesotho and Somalia with 0.04%, 0.15% and 0.16% respectively. In 1986, the entire subregion had a density of 0.42%, the highest after that of North Africa but less than half of the penetration fixed for the whole continent. Seychelles, Mauritius, Swaziland, Zimbabwe and Botswana have attained the objective set with 10.2%, 4.27%, 1.28%, 1.24% and 1% respectively. The telephone growth rate for the entire subregion is 9.26%, far below the target set for the Decade. Kenya has the highest growth rate with 12.33% and Uganda the lowest with 3.3%.

At the time of the take-off of the Decade in 1978, the telephone penetration for the entire continent was 0.4 telephone lines for 100 inhabitants. It increased to 0.65 telephone lines at the end of 1986, with an annual growth rate of 12.09%. A year to go before the end of the Decade, it can be estimated that the target of 1 telephone per 100 inhabitants is far from being attained. However, on the whole the telephone growth rate is satisfactory, even if the 14% annual target is not achieved. With these results one should have been close to the objective set. Unfortunately, as the telephone growth rate increased, Africa's population growth rate also increased in the region of 2.38%. If the population growth rate had remained static, the telephone penetration would have attained 0.8 telephone lines per 100 inhabitants.

3.5.2 Pan-African Telecommunications Network (PANAFTEL)

It should be recalled that the objective of the Pan-African Telecommunication Network is to establish automatic telephone links among all African countries without passing through countries outside Africa.

A. North Africa

All North African countries are linked up with reliable earth and satellite automatic links. However, the micro-wave link between Tripoli and Cairo is not operational for reasons other than technical ones. Besides, each of the countries is equipped with an International Transit Centre and an automatic telex exchange.

B. West Africa

The installation of the earth network is almost complete. Only the following links are remaining:

Nouakchott - Selibay - Kayes
Bamako - Siguiri - Conakry
Bissau - Conakry

All these links feature in ECOWAS Intelcom. B programme. The Conakry-Freetown-Freetown-Monrovia links have been established but are not operational. The Togo-Ghana link is also not operational for want of multiplex equipment in Togo. All the countries of the subregion are equipped with at least one earth station and one Transit Centre, except Guinea Bissau. It would have been possible therefore to link up all the countries automatically if transit and tariff agreements had been concluded.

C. Central Africa

Central Africa has a very small number of earth links. Links that were established and which are operational are as follows:

Yaounde-Libreville
Kigali-Bujumbura
Bukavu-Kinshasa (by satellite)
Kinshasa-Brazzaville

The links to be established are:

N'djamena-Yaounde (to be made operational)
Yaounde-Malaba (to be rehabilitated)
Yaounde-Bangui
Yaounde-Libreville by 600 channel microwave links
Bangui-Brazzaville (transhorizon microwave terminal to be built)
Yaounde-Libreville by 300 channel microwave links
Libreville-Brazzaville
Pointe Noire-Cabinda
Kigali-Bukavu
Kigali-Kampala
Kigali-Bujumbura with 960 channel microwave links
Kinshasa-Bangui
Kalemie-Kigoma
Aba-Juba
Luanda-Cabinda

As can be observed, most of the links among the countries of the subregion are still to be established. All the countries of the subregion, with the exception of Chad whose station has been out of use since 1979 and Equatorial Guinea, have at least one earth station. The Central African Republic, Chad, Sao Tome and Principe and Equatorial Guinea have neither International Transit Centres nor Telex Exchange.

The Central African subregion is indeed far from attaining PANAFTTEL objectives. Considerable efforts are needed to make up for lost time.

D. Southern and East Africa

This subregion has practically established automatic links among all its 18 members. However, the following links should be established to improve the network:

Tanzania-Uganda
Zimbabwe-Mozambique-Malawi
Mozambique-Tanzania
Sudan-Ethiopia
Sudan-Kenya
Ethiopia-Somalia
Mbeya-Dodoma by alternate link
Addis Ababa-Djibouti by alternate link

All the countries of the subregion with the exception of the Comoros have at least one earth station, one international transit centre and an automatic telex exchange.

Under these circumstances and in order to attain the PANAFTTEL objective, it would be necessary to:

- Complete the missing links which were not established, particularly in Central Africa;
- Ensure that African countries establish the largest number of links possible among them, particularly by building where necessary subregional interconnections among them;
- Conclude tariff and transit agreements at continental level.

3.5.3 Training

The Decade training objectives were geared towards ensuring that each African country should meet at least its basic training requirements (Level 4 - technician), that courses for other levels of training be provided in national or multinational African institutions and that specific programmes and courses be provided to the staff to improve their technical know-how, as well as to instructors.

Table 2 gives the breakdown of the training centres for the whole continent. It can be observed, with the exception of about 5 countries, that all African countries have a training centre for at least the basic level (level 4). The Comoros, Seychelles and Cape Verde are indeed small countries for which it would perhaps be too costly to create national schools. In any case, centres established in all the African countries can really meet all the basic training needs (level 4) of African countries.

A. North Africa

Apart from Libya, all the North African countries have at least training schools for level 2 (senior technicians). Algeria has a training school for level 1 (professionally trained engineers).

In the North African subregion therefore, the training objectives have been, on the whole, attained.

B. West Africa

All the West African countries with the exception of Liberia and Guinea Bissau have at least basic training centres (level 4). The Rufisque and Dakar multinational schools provide training courses to level 3 technicians (controllers in all specialized fields) and level 2 (switch and network senior technicians) from West African French-speaking countries and some countries from Central Africa. The training of transmission senior technicians is still provided at the Toulouse Centre.

English speaking countries are self-sufficient up to level 3. Training for level 2 is provided in Nigeria and partially in Kenya and Zambia, in East Africa. Training for level 1 can be provided in Nigeria.

The lusophone countries have the possibility to train their technicians in Angola up to level 3 (controllers). Possibilities however seen very limited. There is still need to create a multinational training centre for the lusophone countries to provide training up to level 2 (senior technicians).

Other specialized training or retraining courses are done according to needs, ongoing projects and possibilities offered. There are no systematic and pluri-annual training programmes.

C. Central Africa

All the Central African countries with the exception of Sao Tome and Principe have at least basic training centres. Cameroon, Gabon, Chad and Zaire have schools which can provide training for level 3 (controllers). The school in Cameroon can train level 2 technicians (senior technicians). However, possibilities are still too limited to meet all the requirements of the subregion with respect to training courses up to level 2. There is need therefore to establish a multinational school of telecommunications for the Central African countries to train technicians up to level 2 (senior technicians).

Specialized in-service training and retraining courses are done on the basis of immediate needs and specific projects and not according to systematic pluri-annual programmes.

D. East and Southern Africa

As in the other subregions, all the East and Southern African countries with the exception of the Comoros and Seychelles have basic training centres (level 4).

The Malawi Multinational Telecommunications Centre provides training to level 3 technicians. The STC in Nairobi, Kenya, also provides training for level 3 and part of level 2. The STC at Ndole, Zambia, also provides training up to level 3. The full training courses for levels 2 and 3 are provided either in Nigeria or the telecommunications schools of developed countries. As in the case of the West African and Central African subregions, specialized in-service training courses are done in the light of immediate needs and specific projects and not according to systematic pluri-annual programmes.

3.5.4 Management

Management is one of the weak points of African telecommunications administrations. As stated in paragraph 1.4.4, sound management will be possible only through the use of modern management methods based on computerization, control panels, organization charts, performance indicators etc., and on the separation of the post and telecommunications entities. Some countries like Cote d'Ivoire, Senegal and Burkina Faso have separated the two bodies without problem. However, it appears that most of the African countries continue to operate with the old structures which are sometimes reorganized to give telecommunications greater budgetary autonomy.

3.5.5 Operation and maintenance

The operation and maintenance objectives have practically been achieved as far as the North African countries are concerned. With regard to the countries South of the Sahara, these objectives have not yet been achieved despite the considerable progress made in recent years. No country has implemented a national improvement and maintenance plan and almost none of the countries concerned have not yet completed the elaboration of such a plan. As stated earlier in paragraph 1.4.3 the implementation of national improvement and maintenance plans by the various countries will require substantial financial resources which must be sought.

3.5.6 Planning

As stated in paragraph 1.4.5, planning is one of the indispensable tools in modern telecommunications. The elaboration of a master plan is necessary for every telecommunications administration. So far, very few administrations have such a plan and a large number is preparing one.

3.5.7 Rural telecommunications

As stated earlier, not much has been achieved in the field of rural telecommunications which can only be truly developed through the implementation of the RASCOM project, the feasibility study of which is underway.

3.5.8 Telecommunications industries

As stated in paragraph 1.4.8, this objective is the most difficult to achieve. Africa's requirements in the field of rural telecommunications are vast and no result has practically been achieved during the Decade. There is an obvious lack of initiative in this field. It will perhaps be necessary that feasibility studies on the manufacture of some materials be undertaken by ECA in co-operation with ITU, UNIDO and UNDP for African countries which request them.

This brief analysis of the development of telecommunications in Africa clearly shows that considerable progress has been made, particularly with regard to the establishment of PANAFTTEL and the national networks. However, the results are inadequate, compared to the objectives set and also considering that the continent is seriously lagging behind as far as the telecommunication sub-sector is concerned.

The Decade is certainly not a failure, in so far as it has aroused awareness to the need for rapid development of the transport and telecommunication sector to ensure the continent's development. However it will be necessary to concretize the results through another Decade which should be better prepared.

3.6 Key factors that affected the success or failure of the implementation of the programme objectives

Factors that have contributed to the implementation of the projects include bilateral financing and supplier's credits.

Factors that have impeded the implementation of the Decade programme are many and varied. The most important include:

1. Low level of resources mobilized for the implementation of the programme, due to indifference on the part of the donors and the extremely difficult prevailing economic and financial situation;
2. Inconsistency between the projects to be implemented and the objectives set by the Decade;
3. Poor planning and co-ordination of the Decade objectives;
4. Difficulties of many governments in providing reliable information on the execution of the Decade programme in their countries;
5. Existence of several autonomous structures such as ECA, the Regional PANAFTTEL Office and PATU, all responsible for telecommunications development in Africa, and absence of project follow-up mechanisms;
6. No follow-up at the level of the ECA, subsequent to the pledges made by the donors;
7. Low importance accorded to transport and communications by certain governments and differences in priorities between national plans of African countries and the Decade programme;

8. Inadequate studies on some projects which did not make it possible to secure the commitment of donors;
9. Lack of co-ordination and interest on the part of many countries in regard to the implementation of regional and subregional projects;
10. Absence of regional and subregional agreements on transit and tariff systems, or their non-implementation by the countries where they exist;
11. Inadequate personnel in the Co-ordination Unit and unsuitable nature of the Unit's structures which seriously hampered performance. The Unit should have been assigned a more active role in specific project planning and elaboration, assessment of objectives, programme follow-up and establishment of effective co-ordination mechanisms, to supplement the purely advisory role of the Inter-agency Co-ordinating Committee;
12. Inadequate preparation of the Decade resulting in the short-time lapse between the proclamation of the Decade in 1977 and the beginning of its implementation;
13. Lack of experience on the part of ECA, the organizations of the United Nations system as well as African intergovernmental organizations in the execution of a programme of this magnitude within such a short time limit;
14. Serious under-development of most African countries in the field of telecommunications and project planning cycles which often cover a period of eight years make a single Decade usefully inadequate for a real take off of the projects and their effective implementation;
15. Low indebtedness capacity of most African countries which makes it difficult for them to have access to substantial bank credits to implement all their projects;
16. Lack of strictness on the part of ECA in the selection of projects submitted by governments and the fact that the telecommunications programme was overly ambitious.
17. Lack of effective system for collecting data and information

CHAPTER IV

LESSONS TO BE DRAWN FROM THE DECADE IMPLEMENTATION

The implementation of the Decade programme has made it possible to draw a number of conclusions.

1. The Transport and Communications Decade in Africa is the first of its kind in the entire United Nations system. Even if the results achieved fell below expectations, the Decade was a unique occasion to focus African and international public opinion on the weaknesses of transport and communications systems in Africa which seriously limit the development possibilities of African countries;
2. Despite the fact that it was not possible to achieve the objectives set, at least some degree of awareness has been aroused in African countries to the need to develop these specific sectors;
3. The regular biennial convening of the Conference of African Ministers of Transport, Communications and Planning aimed at providing guidelines and supervising the Decade has made it possible to recognize the very important place transport and communication sectors occupy in national development plans, thanks to the participation of Ministers of Planning of all African countries in the above-mentioned Conference;
4. Though the Monrovia Strategy and the Lagos Plan of Action emanated from the ECA revised Master Plan, the proclamation of the Decade made it possible to secure therefrom the solemn commitment of African Heads of State and Government to fully achieve the Decade objectives. It is the best guarantee that henceforth transport and communications will be given the important place they deserve in national planning programmes, even if sometimes lack of resources and certain situations dictate otherwise;
5. The proclamation of the Decade has made it possible to take stock of the state of transport and communications, and to identify objectives and priorities in these two sectors. More particularly, in the telecommunications sub-sector, the identification of the objectives and priorities and the implementation of concrete actions in all the fields made it possible to make very significant progress. Admittedly, no objective set by the Decade has been attained. Nevertheless, the progress achieved augurs very well for the future;
6. No development programme can be successfully implemented without adequate mobilization of funds based on a dynamic and effective fund mobilization policy;
7. Efforts geared towards sensitizing African governments and intergovernmental organizations were woefully inadequate;

8. Reliable and detailed information on the execution of the programme in the various countries should be available;
9. Adequate resources should have been provided to RCA as lead agency of the Decade to enable it to carry out its responsibilities;
10. Better mechanism for co-ordination, collaboration and project follow up with the PANAFTTEL Regional Office and intergovernmental organizations would have made it possible to ensure the greater success of the Decade programme;
11. The Decade has highlighted the importance of inter-State projects and the difficulties encountered in ensuring their financing;
12. The PANAFTTEL network has been a very great success even if its objective has not been fully achieved. It can be considered as ready for the subregions of West African and Southern and East Africa even if the interconnections have not been built. Central Africa needs a lot of assistance to complete its network;
13. The attainment of the public telephone bank for 10,000 inhabitants set for rural telecommunications is still very remote and will require the implementation of the RASCOM project, the feasibility study of which is underway;
14. The RASCOM project feasibility study was undertaken and will be an indispensable asset for the development of telecommunications in Africa;
15. Special emphasis was placed on personnel training. Though it is difficult to quantify these objectives and measure the progress made, it is a fact that with a few exceptions, all African countries have centres to meet at least their basic training requirements. Public opinion has in fact been alerted to the need to give special importance not only to basic training but also to specialized training with a view to ensuring a better mastery of new techniques;
16. The attention of the Decade was also focused on human and material resource management. Even if most telecommunications administrations face difficulties resulting from the heavy system inherited, the process for change has begun and there is reason to believe that it will be successfully carried out in all the African countries;
17. It has not been possible to develop rural telecommunications despite the existence of adapted technology. though rural telecommunication projects are not viable from the financial point of view, African governments should be alerted to the need to include telecommunications in any rural development programme.

CHAPTER V

RECOMMENDATIONS

The Decade evaluation with respect to the telecommunications sub-sector has revealed that, notwithstanding certain loopholes, results have been achieved and the Decade has promoted an unprecedented development. Under these circumstances, there is every reason to believe that difficulties can be overcome and that it is possible, not only to attain the Decade objectives, but also to make more significant progress so that the objectives set out in the Monrovia Strategy and the Lagos Plan of Action can be achieved by the year 2000.

A. General Recommendations

The Decade has been the occasion to take stock of the vast telecommunications requirements of African countries. Even if no objective was fully achieved, at least a great leap has been made, which should be consolidated and improved upon. The great merit of the Decade is that it helped identify the requirements for the development of the telecommunication sub-sector. What is needed now is to find ways and means of meeting those requirements. Account will be taken of the Lagos Plan of Action which sets the year 2000 as the landmark for the attainment of the major development objectives.

Recommendation 1

A ten-year plan covering the period 1991 to 2000 should be implemented with a view to attaining the transport and communications objectives within the context of the Lagos Plan of Action.

Recommendation 2

The period 1988-1990 will be used to ensure adequate preparation and planning towards the full implementation of the ten-year plan.

Recommendation 3

The Conference of Ministers of Transport, Communications and Planning will continue to meet every two years as in the past as the supreme body for the implementation of the ten-year plan.

Recommendation 4

The Conference of Ministers of Transport, Communications and Planning scheduled for Kinshasa in March 1988 should charge the Inter-agency Co-ordinating Committee to prepare the terms of reference and the mechanisms to be set up for the conception and implementation of the ten-year plan.

Recommendation 5

ECA will, as in the past, play the role of lead agency for the ten-year plan and should use the experience already acquired during the Decade in playing a much more active role in the implementation of the programme.

Recommendation 6

The co-ordination mechanisms of the PANAFTTEL Co-ordinating Committee should be reviewed and improved with a view to ensuring the highest performance rate and the best follow-up possible.

Recommendation 7

The telecommunication ten-year programme should be based on a master plan, the components of which should be drawn from the PANAFTTEL programme to be strengthened by adapting it to the global strategy of the Lagos Plan of Action and followed by all intergovernmental and United Nations agencies involved in the development of telecommunications in Africa.

B. Recommendations on PANAFTTEL

Special attention should be paid to the least developed countries with the aim of promoting the development of their networks. Many countries have a telephone penetration of 0.1 direct exchange lines per 100 inhabitants and very few exceed 0.5 direct exchange line per 100 inhabitants. Several PANAFTTEL network links, especially in Central Africa, were not established.

Recommendation 1

Steps should be taken to ensure that at the end of the ten-year programme no African country has telephone penetration below 0.5 telephone lines per 100 inhabitants.

Recommendation 2

All the earth links provided for in the PANAFTTEL project should be completed. In this connection, the Central African subregion which is seriously lagging behind compared to the other subregions should be given special assistance to enable it to catch up.

Recommendation 3

Contacts initiated by the PANAFTTEL Co-ordinating Committee with ITU and INTELSAT with the aim of promoting better relations among the various African earth stations should lead to complementarity between these stations and earth links.

Recommendation 4

In view of the fact that interconnections of the different national networks are done through interface mechanisms which are sometimes incompatible, it will be necessary that neighbouring countries demonstrate a greater spirit of co-operation and set up, wherever problems exist, bilateral technical committees to ensure the establishment of interconnections and the effective co-ordination and operation of the system.

Recommendation 5

In order to attain the objectives set by PANAFTEL which aim at integrating the various national networks into a single pan-African network that makes calls within and between African countries possible by automatic operation subscriber to subscriber, it will be necessary to implement subregional and interregional transit programmes so as to ensure a better flow of traffic and facilitate effective exchange of traffic among African countries and the rest of the world.

Recommendation 6

In view of the fact that international transiting should be done through African countries, it will be necessary to equip the international centres with competent personnel very conversant with international procedures and and fluent in the required international languages.

Recommendation 7

The tariff structures of African countries should be reviewed and harmonized with a view to promoting inter-African traffic, taking into account the cost of the different equipment set up to establish the links. The assistance of PATU, OAU, ECA and ITU will be required to enable the various African countries to conclude and implement intergovernmental tariff agreements.

Recommendation 8

In order to attain the objectives set by PANAFTEL, it will be necessary to mobilize resources by appealing to banking institutions and seeking the assistance of the Telecommunications Development Centre, other development institutions as well as subregional and intergovernmental organizations which will have a primary role to play in the implementation of the programme.

C. Maintenance and rehabilitationRecommendation 1

Existing links should be significantly improved so as to bring them closer to international standards generally recommended by CCIR, particularly by rehabilitating defective links and ensuring good maintenance service.

Recommendation 2

Telecommunications administrations of African countries should elaborate and implement, pursuant to the principles enshrined in the improvement and maintenance guide prepared by the Co-ordination Bureau of project RAF/81/018 on aintenance based in Ouagadougou, their national improvement and maintenance plans with a view to ensuring maximum utilization of their networks and making the Pan-African network effective. Assistance will be sought from intergovernmental organizations as well as ECA, ITU and UNDP in the elaboration and implementation of the national improvement and maintenance plans.

D. PlanningRecommendation 1

Each telecommunications administration should prepare and implement a medium and long term national telecommunications master plan. This master plan should aim at the priority objectives of the administration, taking into account the strategy for the implementation of the ten-year programme.

Recommendation 2

In view of the problems posed by the primary sources of supply to stations far from microwave links which constitute the basic links of PANAFTEL (difficulties of supply, frequent breakdowns), telecommunications administrations should try to improve the situation by envisaging, among other things, the possible use of solar energy.

Recommendation 3

A task force should be set up within each telecommunications administration to monitor telecommunications development activities, to prepare general specifications, investment plans and capital requirements for possible financial assistance.

E. TrainingRecommendation 1

African countries should continue to develop their training centres with a view to meeting their requirements up to level 3 (controllers).

Recommendation 2

Agreements should be concluded with countries with centres for training senior technicians and professional engineers so that the greatest part of academic training is done in Africa.

Recommendation 3

Training courses at all levels should be organized for the staff to enable them to improve their skills in technical, administrative and financial fields.

Recommendation 4

Staff salaries and allowances should be made attractive to serve as incentive.

F. Management

Recommendation 1

Current management practices should be improved, especially by applying methods based on job descriptions, filling of vacant posts through competitive exams, implementation of specific and special programmes for the improvement of personnel training in all fields, use of quality service parameters and indicators, and gradual introduction of computer management systems.

Recommendation 2

Telecommunication administrations should work towards full budgetary autonomy leading in the shortest possible time to their separation from postal services and the merging of national and international telecommunications.

Recommendation 3

The system of recovering fees owed for services provided by telecommunication administrations should be improved significantly so as to enable the latter to have enough resources to cover current expenses and self-finance their development projects.

G. Manufacture of telecommunications equipment

Recommendation

African countries should elaborate and implement projects for the manufacture of common telecommunications equipment with the aim of meeting the greatest part of their requirements. The assistance of ECA, OAU, ITU, UNDP and UNIDO will be needed for the elaboration and implementation of such projects as well as the conclusion of inter-State agreements on the creation of regional and subregional markets.

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Table 1: Telephone penetration in Africa

Country	Population 10 ⁶		Direct exchange lines 10 ³		Telephone penetration per 1000 inhabitants		Telephone growth	
	1978	1986	1978	1986	1978	1986	68/78	78/86
NORTH AFRICA	85.014	101.344	394.895	2 000	1.05	1.97	7.6	13.7
Algeria	18.5	22.2	196.1	573	1.06	2.58	7.6	7.8
Egypt	39.2	46.7	362.0	861.1	0.92	1.84	n.a	27.3
Libya	2.444	3.742	100.495	n.a	4.11	n.a	15.0	n.a
Morocco	18.906	22.06	149	240	0.79	1.09	2.9	8
Tunisia	5.964	7.4	87.2	216	1.46	2.9	9.1	7.0
WEST AFRICA	139.918	171.048	186.331	406.85	0.137	0.25	0.137	12.6
Benin	3.197	3.3	5.4	12	0.17	0.36	10.0	8.3
Burkina Faso	5.938	7.97	4.0	7.9	0.07	0.09	11.0	8.0
Cote d'Ivoire	7.188	9.0	27.6	59.6	0.38	0.66	11.21	12.07
Cap Verde	0.273	0.32	1.49	3.95	0.55	1.23	10.5	15
Gambia	0.494	0.656	1.47	6	0.30	0.85	8.0	n.a
Ghana	10.0	12.6	36.1	38.4	0.36	0.3	6.1	0.7
Guinea	5.143	6	6.6	14.1	0.13	0.24	n.a	13.0
Guinea Bissau	0.791	0.8	2.0	6.23	0.25	0.78	n.a	11.3
Liberia	1.5	2.262	6.0	8.5	0.4	0.4	n.a	n.a
Mali	5.697	8.2	3.30	7.3	0.06	0.09	1.0	7.4
Mauritania	1.318	1.74	2.677	4.08	0.2	0.23	n.a	25
Niger	5.246	6.5	5.2	8.0	0.10	0.12	12.0	6.1
Nigeria	80.0	98.5	58.7	204.7	0.07	0.20	5.0	13.7
Senegal	4.436	6.5	15.2	23.5	0.34	0.36	4.5	4.24
Sierra Leone	3.33	3.6	7.0	13.3	0.21	0.38	n.a	5.0
Togo	2.371	3.1	5.6	8.8	0.24	0.28	12.0	7.4

Table 1: Telephone penetration in Africa (cont'd)

Country	Population 10 ⁶		Direct exchange lines 10 ³		Telephone penetration per 1000 inhabitants		Telephone growth	
	1978	1986	1978	1986	1978	1986	68/78	78/86
CENTRAL AFRICA	56.326	66.38	107.339	150.56	0.198	0.23		4.44
Angola	6.2	8.18	32.3	46	0.52	0.56	6.4	n.a.
Burundi	3.87	4.9	3.389	6.6	0.09	0.13	7.0	8.0
Cameroon	7.664	10.4	19.8	31.6	0.25	0.3	12.8	9.0
Central African Republic	2.256	3	2.2	2.9	0.1	0.1	n.a.	n.a.
Chad	4.0	45	2.4	2.26	0.06	0.05	5.3	n.a.
Congo	1.3	1.81	6.9	10.3	0.53	0.56	2.4	3.5
Gabon	0.526	1.29	19.9	1.71	1.66	n.a.	12.11	n.a.
Equatorial Guinea	0.31	0.401	1.0	n.a.	0.32	n.a.	9.9	n.a.
Rwanda	4.8	6.275	2.7	n.a.	0.06	n.a.	9.9	n.a.
Sao Tome & Principe	0.1	0.108	0.750	2.0	0.75	1.85	n.a.	20.0
Zaire	25.3	33	26.9	29.0	0.1	0.09	8.8	n.a.
EAST AND SOUTHERN AFRICA	130.869	157.8237	354.997	650.75	0.271	0.42		9.26
Botswana	0.767	1.05	5.9	10.5	0.77	1.0	11.0	8.0
Comoros	0.37	0.48	0.14	0.21	0.04	0.05	1.8	5.55
Djibouti	0.3	0.43	2.35	4.05	0.78	0.94	6.9	7.0
Ethiopia	30.017	44.7	60	103	0.20	0.23	8.7	2.0
Kenya	14.875	20.3	65.3	118.4	0.44	0.58	8.5	12.33
Lesotho	1.156	1.5	1.8	8.96	0.16	0.6	8.3	15
Madagascar	8.41	9.7	15.1	22.2	0.15	0.23	3.5	n.a.

Table I: Telephone penetration in Africa (cont'd)

Country	Population 10 ⁶		Direct exchange lines 10 ³		Telephone penetration per 1000 inhabitants		Telephone growth	
	1978	1986	1978	1986	1978	1986	68/78	78/86
Malawi	8,41	9,7	15,1	22,2	0,15	0,23	3,5	n.a
Mauritius	5,744	7,3	13,4	20,6	0,23	0,28	8,0	5,97
Mozambique	0,91	0,99	19,9	42,3	2,19	4,27	6,8	10,12
Seychelles	11,76	13,6	29,3	37,6	0,25	0,28	9,5	n.a
Somalia	0,062	0,0657	2,47	6,1	4	10,2	30,5	8
Sudan	3,241	5,4	5,076	9,1	0,16	0,17	12,5	n.a
Swaziland	18,656	n.a	43,541	n.a	0,23	n.a	3,4	n.a
Tanzania	0,529	0,69	3,9	8,23	0,74	1,28	8,2	10,6
Uganda	17,5	21,7	35,02	53,8	0,2	0,25	10,0	8,7
Zambia	11,172	14,9	22,0	26,8	0,20	0,18	8,3	3,5
Zimbabwe	5,4	6,5	29,8	45,3	0,66	0,7	5,6	n.a
	6,30	8,54	n.a	106,2	n.a	1,24	n.a	4,0
Total	409,127	496,613	1 545,488	3 228,2	0,38	0,65	8,7	12,09

Table 2: Telecommunications Training Centres in Africa

Countries	Level 1	Level 2	Level 3	Level 4	Remarks
Algeria	x	x	x	x	
Angola			x	x	
Benin			x	x	Levels 2 and 3 at EMT Ruffisque and Dakar, Senegal
Botswana					Level 3 at MCTC Blantimere, Malawi. -Special courses at CTS, Nairobi, Kenya
Burundi				x	
Cameroon		x	x	x	
Cape Verde					
Central African Republic			x	x	Special level 3 courses at Ruffisque and level 2 at Dakar Senegal
Chad			x	x	Level 3 special courses at Ruffisque and level 2 at Dakar, Senegal
Comoros					
Congo					Level 3 special courses at Ruffisque and Bangui, Central African Republic
Egypt		x	x	x	
Equatorial Guinea			x		
Ethiopia		x	x	x	
Gabon			x	x	
Gambia				x	
Ghana			x	x	

Table 2: Telecommunications Training Centres in Africa

Countries	Level 1	Level 2	Level 3	Level 4	Remarks
Guinea		x	x	x	
Guinea Bissau					
Cote d'Ivoire					Level 3 special courses at EMT Ruffisque, Senegal
Kenya		x	x	x	Level 2 is incomplete. Only some courses are available
Lesotho				x	Level 3 at MCTC Blantyre, Malawi. Special courses at CTS Nairobi, Kenya
Liberia					
Libya					
Madagascar		x	x	x	
Malawi					
Mali			x	x	Some level 2 special courses at Dakar, Senegal
Mauritius			x	x	

Table 2: Telecommunications Training Centres in Africa (cont'd)

Countries	Level 1	Level 2	Level 3	Level 4	Remarks
Mauritania					Level 3 at Ruffisque and level 2 at Dakar, Senegal
Morocco		x	x	x	Preliminary study being undertaken regarding level 1 capability
Mozambique				x	
Namibia					Level 4 at STC Ndola, Zambia
Niger				x	
Nigeria	x	x	x	x	
Uganda		x	x	x	Part of level 3 at CTS Nairobi, Kenya
Rwanda				x	
Sao Tome et Principe					
Senegal		x	x	x	
Seychelles					
Sierra Leone				x	

Table 2: Telecommunications training centres in Africa (Cont'd.)

Country	Level 1	Level 2	Level 3	Level 4	Observations
Somalia			x	x	
Sudan		x	x	x	
Swaziland				x	Level 3 in MCTC Blantyre in Malawi special course at CTS in Nairobi, Kenya
Tanzania			x	x	Part of level 3 at CTS in Nairobi, Kenya
Togo			x	x	Part of level 3 in Rufisque at level 2 in Dakar, Senegal
Tunisia		x	x	x	
Zaire			x	x	
Zimbabwe			x	x	

Table 3: Progress in the implementation of PANAFTEL

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
West Africa							MT20 became operational in 1983
Benin	MT20- Digital (A.S.A.M)	112	50 Nb 5 Cotonou - Abidjan Cotonou- Dakar	Abomey - Cabi 4	Submarine cable A	Atlantic P	The station became operational in 1984
		62 R2	- "Niamey - "Lome - "Lagos - "Fada-N'Gourma	FH -960 FH-960 FH -966 GH-120/900			The submarine cable became operational in 1982-ACDI Cotonou -Lome in 1977 Cotonou-Lagos in 1976 Cotonou-Fada-N'gourma in 1986
Burkina-Faso Ouagadougou in 1977 Abidjan	Janus- Semi Electronic FH-930	712	78 Nb5 76 R2 65 Other	Ouagadougou-Bamako Ouagadougou-Abidjan A	FH -960 FH-960	Atlantic	CIT became operational in 1978
			- "Accra - "Lome - "Koupela-Niamey - "Dori- Niamey - "Mopti-Bamako - "Fada-Ngourma - "Porga	FH-960 FH-300 FH-960 FHL20 FH-960/120/960 GH-960			Operational in 1977 1987 1977 1983 ACDI 1 1987 LG 1987 LG 1987 CEDEAO 11

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Gambia Banjul	E-10-Digital (A.S.A.M.)	48 Nb5 80 32R2	Banjul-Dakar "Ziguinchor Bissau	FH-300 FH	Banjul B	Atlantic MI	Put into operation in 1987 FH-Banjul-Dakar put into operation in 1977Ziguinchor-Bissau put into operation in 1988
Ghana Accra	MT20- Digital (A.S.A.M.)		Accra-Abidjan -"Bolgatanga -"Ouagadougou -"Accra-Lome	FH-960 FH-960 FH-960 FH-960	Nkutunse A	Atlantic P	MT20 put into operation in 1987 FH Accra-Abidjan put into operation in 1987 1987 Ouagadougou 1987 Accra-Lome 1987
Guinea Conakry	MT20 (A.S.A.M.)	141 81 Nb5 60 R2	Conakry-Bissau Dakar	FH-960 FH-960	Wonkifong A	Atlantic MI	MT20 put into operation in 1987 All the links became operational in 11987 except Conakry-Abidjan which will be operational in 1988

Table 3: Progress in the implementation of PANAFTEL

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Cape Verde	(A.S.A.M.) Siemens -Digital (A.S.A.M.)	30 Nb5	Praia-Dakar	SAT-SCPC	Varzea B		CITI became operational in 1985 The earth stations became operational in 1983
Praia							
Cote d'Ivoire			Abidjan-Monrovia	FH-960/500	Abidjan A	Atlantic M1	CCCT became operational in 1975
Abidjan	CCC x/Ear (A.S.A)	620 995 Nb5 1089	Abidjan-Monrovia Abidjan-Monrovia Conakry	FH Transhorizon 600/120 FH-960	Abidjan 2	Atlantic P	MT20 became operational in 1987 FH Abidjan-Monrovia became operational in 1986
Abidjan	MT20-Digital	88 R2	-Bamako Ouagadougou Accra	FH-960 FH 960 FH 960			Via MT Nimba will be operational in 1988 FH Transhorizon became operational in 1979 Via MT Nimba will be operational in 1988 Abidjan-Bamako became operational in 1987 ECOWAS Ouagadougou in 1975 Accra in 1986 Submarine cable Abidjan - Lagos in 1981 Abidjan -Dakar in 1976 Cotonou - 1982 (via Lagos)
			Lagos Dakar Cotonou	Submarine cable 480 Submarine cable 480 Submarine cable 480			

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Guinea Bissau Bissau	MT20	141	Bissau-Winguinchor -Conakry	FH-300	UHF-60		Link UHF 1978 FH-Bissau-Zinguinchor in operation in 1987 ECOWAS projects Phase II under study
Liberia Monrovia	ARM20 X/Br (A.S.A.M.)	40 Nb5 106 12-R2 54 other	Monrovia-Freetown Monrovia-Conakry -Abidjan	FH-600/960 FH-600/960 FH-Transhorizon	Sinkor B	Atlantic M1	Monrovia-Freetown 1980 Monrovia-Freetown Abidjan 1986 Monrovia-Freetown Transhorizon 1979 Monrovia-Conakry 1988
Mali Bamako	MTLJ-Digital (A.S.A.M.)	78-Nb5 300 200-R2	Bamako-Nouakchott Bamako-Nouakchott Conakry Bamako-Abidjan Bamako-Dakar -Sikasso-Ouagadougou -Mopti-Ouagadougou -Gao-Niamey	FH960 FH 960 FH-960 FH-960/120/960 FHL20	Sulyman Bougou IB Sulyman Bougou2 B	Atlantic M Atlantic P	ECOWAS projects Phase II under study Bamako-Abidjan 1987 Dakar 1983 Sikasso-Ouaga 1983 Mopti 1987 L G Ouagadougou-Gao Niamey 1987 L.G
Mauritania Nouakchott	MT20-Digital (A.S.A.M.)	180 90-Nb5 50-R2	Nouakchott-Dakar Nouakchott-Dakar- Bamako	CC +FH360/600	Toujoumine A	Atlantic P	CC between Nouakchott and FH Dakar Rosso 1978 ECOWAS project II understudy

Table 3: Progress in the implementation of PANAFTEL (Cont.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Niger	CCIR x/Bar	96 Nb5	Niamey-Koupela	FH-960	General P	Indian P	Niamey-Koupela-Ouaga 1983 ACI
Niamey	Renta Conta	300 96 R2 80 other	Niamey-Gao-Koupela Niamey-Tera- Niamey-Cotonou Niamey-Lagos	FH-120 FH-120 FH-960 FH-300	Karma A	Atlantic M1	Tera Ouaga -1987 Tera -Ouaga-1987-Lile Niamey-Cotonou-1983 ACI Niamey-Lagos 1987 ECCAS Gao 1987 L.G.
Nigeria Lagos	AFRIS semi-electronic NIC Project under study	3000 900 Nb5 2500 1080 R2	Lagos-Cotonou Lagos-Niamey (Sokoto)	FH-960 FH-960	Lantate 1 A Lantate 2 A	Indian P Atlantic	Not in service Project under study
Kaduna Enugu	(A.C.A.M)	800 Nb5 2500 100 Nb5	Lagos-N'Djamena Yaounde Abidjan ...N'Djamena-Port Harcourt-Douala Lagos-N'Djamena Niamey (via Maradi)	FH FH CSM 480 CSM	Kojima 1 A Kojima 1	Atlantic M1 Atlantic M2	Project under study Lagos-Cotonou 1975 Niamey ...-Abidjan CSM 1981
Senegal	CSM Renta-Conta (A.C.A.M)	x/Bar 414	Dakar-Nouakchott Dakar-Prai Dakar-Kaolack- Banjul -Bamako -Conakry -Casablanca -Abidjan (via Lagos) -Cotonou (via Lagos) -Banjul -Ziguinchor-Bissau	CC + FH-600/360 SAT-SCPC FH-300 FH-960 FH-960 CSM-840 CSM-490 CSM-4 FH UHF-60 FH-300	Gamboul A	Atlantic P	Dakar-Nouakchott 1975 and 1976 -Kaolack-Banjul 1977 -Bamako 1983 ACI -Conakry 1987 -Casablanca 1977 -Abidjan 1978 -Cotonou 1982 -Banjul 1987

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Sierra Leone	MF-20 Digital	36 Nb5	Freetown-Conakry	FH-960	Wilberforce B	Atlantic M1	Not of the routes is operational
Freetown	(A.S.A.M)	84 48 R2	Monrovia	FH-960/600			
Togo	CCCT x 7/Bar	300 52-Nb5 132 R2	Lome-Accra Ouagadougou Lome-Cotonou	FH-960 FH-960	Cacavelli A	Atlantic P	Lome-Ouagadougou 1977 Lome-Cotonou Accra 1987
Central Africa	X/Bar	82	Luanda-Cabinda	FH-transhorizon	Cacuaco 1 A	Atlantic P	Earth station spade operated
Angola	SA		Cabinda-Pointe Noire*	FH	Cacuaco 2 B	Atlantic M1	
Luanda			Luanda-Kinshasa*	FH			Only Luanda-Cabinda 1981 is operational
			Luanda-Lusaka*	FH			Routes understudy
Burundi	Penta-Conta 2 Bar	18	Bujumbura-Kigali	UHF-24			Bujumbura-Kigali ORF 1922
Bujumbura	(A.S.A.M,		Bujumbura-Kigali-Kigali	FH-300+960			Bujumbura-Kigali-Bukavu
			Bujumbura-Kigali-Bukavu	UHF-24 48			UHF 1980 1s section
			Bujumbura-Kigali-Dar-es-Salaam	FH-960			Bukavu-Kinshasa by satellite
Cameroon	Penta-Conta 2 Bar	348	Yaounde-N'Djamena	FH-500	Zamenga A	Atlantic P	Yaounde-N'Djamena 1980 not operational
Yaounde	(A.S.A.M)		Yaounde-Lagos	FH-600/960	Donala A	Atlantic P	Yaounde-Lagos 1980 not operational
			Yaounde-Malabo	FH-Transhorizon			Yaounde-Malabo 1975 not of service
			Yaounde-Banjul	FH-600			Yaounde-Banjul 1975 out of service
			Yaounde-Libreville	FH-Transhorizon FH 600			Yaounde-Libreville Transhorizon in service (Douala-Kribi) route under service

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Central African Republic	M	36	Bangui-Yaounde Bangui-Brazzaville	FH-500 FH-960	Mpoko B	Atlantic M1	Bangui-Yaounde installed 1973 but not operational Bangui-Brazzaville installed 1979 Terminal de Bangui not yet installed
Equatorial Guinea		17	Malabo-Yaounde	FH-Transhorizon	Bata B	Atlantic P	FH transhorizon intalled in 1974 is out of service
Chad		38	N'Djamena-Lagos	FH	Gondil B	Atlantic M1	FHN N'Djamena-Lagos is out of service since date of installation 1980
N'Djamena			N'Djamena-Yaounde	FH 950			FH N'Djamena-Yaounde idem
Congo Brazzaville	CGCT N/Bar	45	Brazzaville Libreville Brazzaville-Bangui Brazzaville-Kinshasa Brazzaville-Pointe Noire Pointe-Noire-Calinda	FH-960 FH-Transhorizon Moundou A FH-20 FH-960 FH 960		Atlantic P	Routes under study Brazzaville-Bangui constructed upto the border with CAR section Brazzaville-Pointe Noire 1982 Brazzaville-Kinshasa 1981 Brazzaville-Kinshasa 1981
Gabon Libreville	Renta-Orta 1/Bar	276	Libreville Yaounde Libreville - Yaounde Libreville - Brazzaville	FH FH-Transhorizon 36/120	N'Holtang 1 A N'Koltane 2 B Francaville A	Atlantic P Atlantic M1 Atlantic P	Route under study FH-Transhorizon Brazzaville Libreville 1973

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Rwanda Kigali	NEC-Electrorique	30 12-Nb5 18 -R2	Kigali-Bukavu* Kigali-Kampala Kigali-Bujumbura Kigali-Bujumbura* Kigali-Dar es Salaam	FH FH-24/120 UHF-24 FH-960	Kucikiro B	Indian P	Routes under study Kigali-Bujumbura UHF-1972 Kigali-Kampala not operational Rehabilitation planned
Sao Tome & Principe Sao Tome					Sao Marcel B	Atlantic P	
Zaire Kinshasa	X/Bare	500	Kinshasa - Brazzaville Kinshasa -Luanda Kinshasa-Lusaka Kinshasa-Lusaka Kinshasa-Bangui* Bukavu-Kigali* Bukavu-Bujumbura Goma-Kampala* Kalemie-Kigoma* Aba-Juba	FH-120 UHF-24 +48	N'sele A	Atlantic P	*Routes under study Kinshasa-Brazzaville 1981 Kinshasa Luanda (section Lubumbashi- Kinshasa-Lusaka (Goya delayed UHF Bukavu-Bujumbura 1980

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits		Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Eastern & Southern Africa				Gaborone - Francistown	FH-480	Kigale B	Atlantic M1	Gaborone-Francistown 1986 34/MB
Botswana Gaborone	AXE-Digital (A.S.A.M.)			Francistown-Bulawayo	FH-960			Francistown-Bulawayo 1984
Comoros Moroni				Moroni-East Africa				Under study
Djibouti	COCE X/Bar	325	180-Nb5	Djibouti-Addis-Ababa	UHF-24	Ambouli B	Indian P	Djibouti-Addis Ababa (UHF-1982)
Djibouti	(S.7A)		145-R2	Djibouti-Addis Ababa				Djibouti-Hargeisa-1986
				Djibouti-Assab	FH-960			Djibouti-Cairo 1986
				Djibouti-Hargeisa				
				Djibouti-Cairo	CSM			
Ethiopia	Ethiopia X/Bar	106	50 Nb5	Addis Ababa - Khartoum*	FH	Sululta 1A	Atlantic P	Addis Ababa-Khartoum (Route)
Addis Ababa	(S.A.M.)		46-R2	Addis Ababa-Hargeisa*	FH	Sululta 2B	Indian P	Gederef-Gonder delayed
	AXE-10 Digital	3000	300 Nb5	Addis Ababa-Nairobi	FH-960			*Under Study
			150 R2	Assab-Djibouti	UHF-24			Addis Ababa-Nairobi 1986
				Assab-Djibouti	FH-960			Assab-Djibouti FH 960-1986

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Kenya	Fugitau X/Bir		Nairobi-Addis Ababa	FH-960	Longonot 1A	Indian P	Nairobi-Addis Ababa 1981
Nairobi	(A.S.A.M.)	1000 145 Nb5	Nairobi-Libi	FH-34 M/Bite	Longonot 2 A	Atlantic P	Nairobi-Libi-1986
Nairobi	Axe-10 Digital (A.S.A.M)	36 other	Nairobi-Kampala	FH-960			Nairobi-Kampala 1974
		1000 500 Nb5	Nairobi-Dar-es Salaam	FH-960			Nairobi-Dar es Salaam (Mombassa)1974
		510 R2	via Mombasa				Nairobi-Dar es Salaam (Arusha) 1974
			Nairobi-Dar es Salaam (via Arusha)				Nairobi-Dar es Salaam (Arusha) 1974
			Nairobi-Lokichaggio (Juba route)	UHF-120			
Lesotho	AXE-10-Digital	748			Ha-Sofonia B	Atlantic M2	
Maseru	(A.S.A.M)						
Madagascar	(CGCT X/Bai	48	Antananarivo-East Africa		Philbert Tairanana	Indian	By Satellite
Antananarivo							
Malawi	NXE-70SPC Analogical	256 108 Nb5	Lilongwe-B				
			Blantyre	FH-960			To be operated in 1980
		60 -R2	Lilongwe-Dar es Salaam	FH-34M/Bite			
Blantyre			(Mzuzu-Mbaya)				
			Mbaya		Kanjedze 1 B	Indian P	
			Lilongwe-Lusaka	FH-960			
			Blantyre-Beira*				
			(Via Tete)	FH-34M/Bite			
			Blantyre-Harare*				
			(Via-Tete)	FH-34 M/Bite			

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Mauritius Port-Louis	GE Electronic		Port-Louis-East Africa		Cassie B	Indian P	Satellite circuits under study
Mozambique Maputo	7x2-10-Digital (A.S.A.M.)		Beira-Blantyre via Tete Beira-Lusaka Beira-Dar es Salaam Maputo-Mbabane Beira-Harare Beira-Harare Beira-Maputo Victoria-East Africa	FH FH FH FH-960 UHF-60 FH FH	Boane A	Atlantic P	Beira-Blantyre to be operational in 1983 Beira-Lusaka (Section Zambia completed Beira-Dar es Salaam Tanzania Part completed in 1972 remaining Mozambique part Beira-Harare and Beira-Maputo under study UHF-Beira-Harare 1986 Satellite circuits
Seychelles Victoria	7x2-10-Digital				Bon espoir B	Indian P	
Somalia Mogadiscio		15	Hargeisa-Addis Ababa* Addis Ababa* Hargeisa-Djibouti Mogadiscio-Liboi*	FH FH-960 FH-UHF	Kaaraan B	Indian P	Route postponed (Hargeisa Addis Ababa) Mogadiscio-Liboi to be operational Planned for 1988 Hargeisa-Djibouti 1986
Sudan Khartoum	Teletre DINI (A.S.A.M.)	776 500 No5 578-R2	Khartoum-Cairo Khartoum-Port-Sudan (Jeddah) Khartoum-Addis Ababa* Juba-Abu (Zaire) Juba-Lokichoggio	FH K FH-960/500 FH FH UHF-12	Umm Heraz 1 A	Atlantic P	* Under study
					Umm Heraz 2 A	Atlantic M1	Khartoum-Port-Sudan 1979 under rehabilitation

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Swaziland Mbabane	Hitachi-C-400	73	Mbabane-Maputo	FH-960	Ezulwini B	Atlantic M2	FH in 1984
Tanzania Dar es Salaam	Fujitsu X/Ber (A.S.T.M)	355	Dar es Salaam-Nairobi (Mombasa) Dar-es-Salaam Nairobi (Arusha) Dar-Bujumbura* Dar-Kigali* Dar-Lusaka Dar-Lilongwe Dar-Maputo* Dar-Kampala*	FH-960 FH FH FH-960 FH-34 M Bite FH Transhorizon FH-960/60	Mwenge 1. B	Indian P	*Routes studies Dar es Salaam-Nairobi 1974 Dar es Salaam-Nairobi 1982 Lusaka 1982 Lilongwe 1987 Maputo will be completed after 1987 ... "Kampala and Kigoma-Kalemie were under study

Table 3: Progress in the implementation of PANAFTEL (Contd.)

Country and location	System of International Transit Centre	Number of circuits	Routes	System and capacity	Earth and standard capacity	Satellite location and path	Remarks
Uganda Kampala	Fujitsu-FX 800 (A.S.A.M.)	348 70-Nb5 13 -R2 1 Other	Kampala-Nairobi Kampala-Nairobi-Kigali* Kampala-Kigali (via Bukua)* "Dar-es-Salaam"	FH-960 FH FH	Mpeme A	Atlantic P	Kampala-Nairobi 1974 *Routes under study
Zambia Lusaka	ARM X/Bar (S.P.M)	669 50-Nb5 50 other	Lusaka-Harare* Lusaka-Dar-es Salaam Lusaka-Lilongwe Lusaka-Maputo* Lusaka-Livingstone Lusaka-Chingola Chingola-Lubumbashi* Livingstone-Bukwayo Chingola-Zambezi	FH FH 960 FH960 FH FH-1800 FH-960 FH-960	Mwembeshi A B Mwembeshi 2 B or A 1	Indian P Atlantic P	Lusaka Harare planned for 1988 Lusaka-Harare-Mapoto and Chingola-Lubumbashi under-study Dar-es-Salaam 1982 Lusaka-Dar es Salaam 1985 Lusaka-Lilongwe 1986 Lusaka-Chingola 1986 Zambezi-Chingola 1986 Lusaka-Livingstone 1974 Bulawayo 1984
Zimbabwe Harare	AXE-1J-Digital (A.S.A.M)	3000 113Nb5 5260ther	Harare-Bulawayo Tete* Harare-Beira Kariba Kariba-Lusaka* Bulawayo Francistown Bulawayo-Livingstone Harare-Blantyre	FH-1920-1260 FH UHF-60 FH-960 FH FH-960 FH-960 FH			Harare-Tete, Harare-Blantyre Kariba-Lusaka are SATOC projects not yet implemented Harare-Bulawayo 1969-1984 Harare-Beira 1986 Bulawayo-Francistown 1984 Bulawayo-Francistown Livingstone 1985