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International Co-operation for
Telecommunications Industry in Africa
Arusha, United Republic of Tanzania
11-15 December 1989

REPORT*

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The following is a list of acronyms together with their meanings used throughout the text.

ADB:	African Development Bank
ARCT:	African Regional Centre for Technology
ECDC:	Economic Co-operation among Developing countries
ECOWAS:	Economic Commission of West African States
ESAMI:	Eastern and Southern African Management Institute
IDDA:	Industrial Development Decade for Africa
INRES-South:	Information Referral Service
INTIB:	Industrial and Technological Information Bank
ITU:	International Telecommunications Union
PATU:	Pan African Telecommunications Union
PTA:	Preferential Trade Area
R & D:	Research and development
SADCC:	Southern African Development Co-ordination Conference
TCDC:	Technical Co-operation among Developing countries
TIES:	Technological Information Exchange System
UAPT:	Union Africaine des Postes et Télécommunications
UDEAC:	Union Douanaire et Economique de l'Afrique Centrale
UNESCO:	United Nations Educational, Scientific, and Cultural Organization
UNIDO:	United Nations Industrial Development Organization
UNDP:	United Nations Development Programme

I. INTRODUCTION

Background

The telecommunications sector in Africa is characterized by an almost total dependence on the international market for the supply of required equipment since there is no major indigenous telecommunications industry in the region.

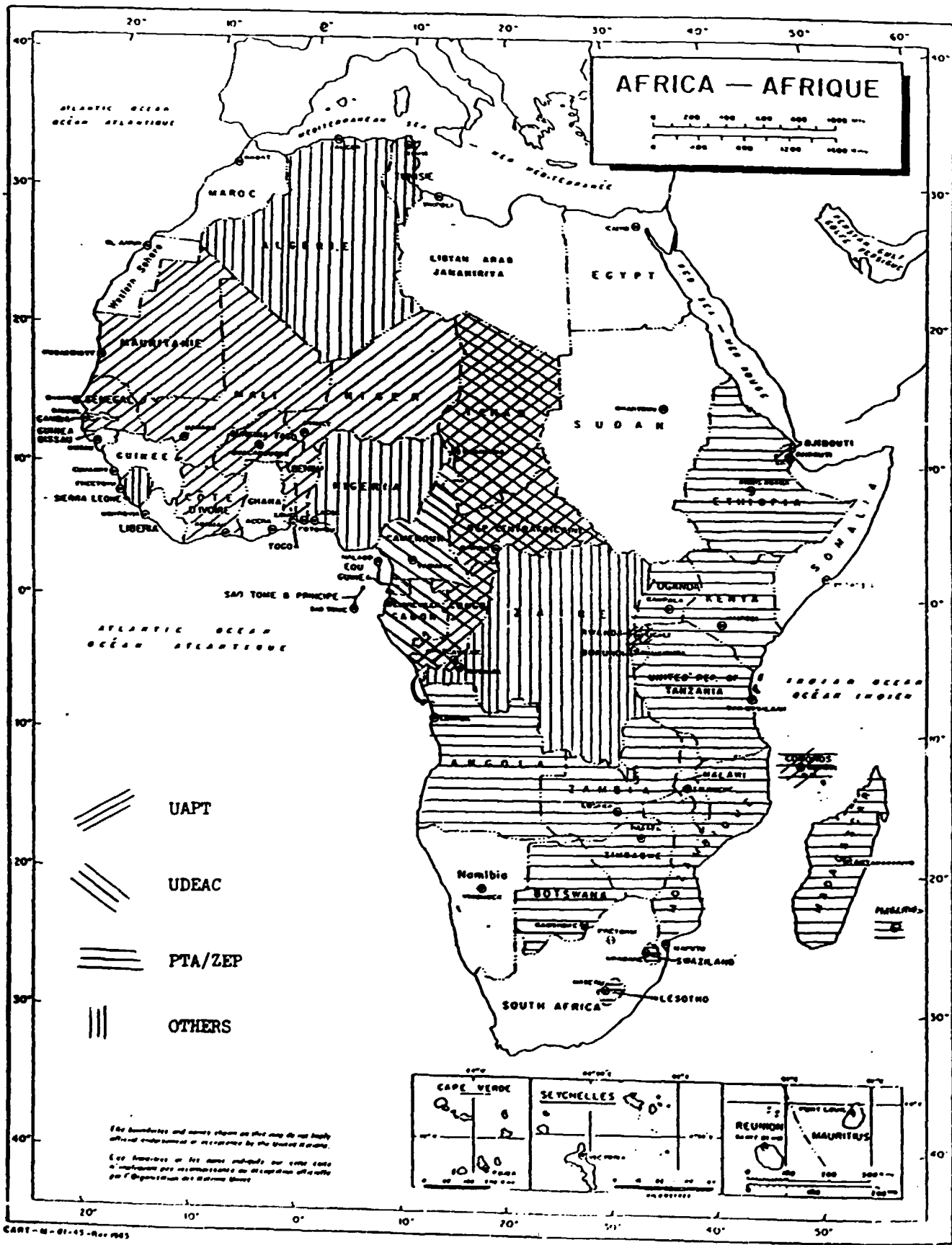
However, with a population of over 500 million and a surface area that is second only to Asia, Africa represents one of the biggest potentials for the expansion of the telecommunications industry. Africa's share in the world demand for telecommunications equipment is expected to increase at an annual rate of 8 per cent, reaching an estimated \$US 1 billion per year by the year 1992.

Despite this potential market for telecommunications equipment in Africa, due to the efforts to save on the huge foreign exchange investment required to expand and improve the telecommunications network, only a few African countries have embarked on the local production, on a modest scale, of a limited range of telecommunications equipment. There is therefore sufficient justification to promote the local manufacture of telecommunications equipment, components and spare parts in Africa, and considerable scope to improve and expand existing production.

Preliminary work in this respect started in UNIDO with a regional seminar on promotion and development of telecommunications industries in Africa, organized jointly with PATU in 1982. The prospects for the manufacture of telecommunications equipment in Africa were discussed in more concrete terms in a seminar organized in 1986 in Harare, Zimbabwe. Based on this work, an investors'/donors' forum was originally envisaged in the biennial programme of UNIDO for 1988-1989. In order to prepare for the forum, a technical preparatory meeting was organized by UNIDO, in co-operation with ITU and the Government of Brazil, in Sao Paulo, Brazil, in May 1989.

As a result of the preparatory meeting, it became clear that the time was more opportune to assist African countries in developing a policy and strategy framework and an integrated programme approach for the telecommunications industry, and to help them to exchange views and perspectives with a cross-section of potential donors and investors as well as international finance institutions and banks.

Figure 1: Geographical distribution of participation at Conference



The Conference was therefore organized in co-operation with ITU and PATU. Recognizing that any actions taken will require various levels of management skills in order to implement, the Eastern and Southern African Management Institute (ESAMI) with headquarters in Arusha, Tanzania, accepted to host the Conference.

Conference Objective

Based upon a systematic analysis of country studies and country information on the short- and long-term needs for telecommunications equipment, and assessment of the capacity, product range and existing technological infrastructure for the manufacture and maintenance of this equipment, as well as the related software needs, the objective of the Conference was to discuss and agree on mechanisms and a plan of action to help, support and promote this industrial subsector in Africa.

II. OPENING OF THE CONFERENCE

The Conference was attended by 42 participants including delegates from 20 African countries representing their telecommunication authorities or other Government departments, 3 regional African organizations, 1 Indian delegate, 3 international organizations as well as 15 participants representing private companies from Africa, India and other industrialized countries. A list of participants and a map depicting the geographical distribution is shown in Annex I and Figure 1 respectively.

Election of Officers

The delegates elected the head of the delegation of Tanzania, Mr. B. I. Mbakileki, as Chairman. Mr. S. Sene (Senegal) was elected First Vice-Chairman, Mr. S. D. Duma (Zimbabwe) Second Vice-Chairman, Mr. S. Ghanouchi (Tunisia) First Rapporteur and Mr. F. Dima (Central African Republic) served as Second Rapporteur.

Conference Agenda

The following agenda was proposed and adopted:

- Opening address;
- Election of officers;
- Adoption of agenda;
- Situation of telecommunications industry in Africa;
- Management and telecommunications (ESAMI);
- National strategies and policies for a telecommunications industry in Africa (Issue Paper I).

- Development of telecommunications in India;
- Development of the manufacture of telecommunications equipment in Africa - regional programme for the Governments of African countries, project document of feasibility study;
- Regional and international co-operation for a telecommunications industry in Africa (Issue Paper II);
- Economic and technical co-operation among developing countries to promote development of the telecommunications industry in Africa;
- Presentation and discussion of national papers;
- Contributions of international organizations;
- Company strategies, activities and policies;
- Presentation and discussion of prepared project proposals;
- Discussions of preliminary conclusions and recommendations;
- Adoption of conclusions and recommendations;
- Discussion of draft report;
- Adoption of draft report.

III. DISCUSSIONS OF PAPERS

Situation in Africa

To set the scene for the Conference, a UNIDO expert described the general situation of the telecommunication network in Africa. He gave a detailed analysis of main structural constraints at the root of the slow development of telephone installations, frequent malfunctions and the high level of tariffs (Figure 2). The complexity and inter-action of these constraints severely limit the positive impact of the multiplier effects of telecommunications on the national economy. Despite significant investment realised in the sub-sector in Africa during the last two decades, some countries still give relatively low priority to telecommunications in economic and social development plans. Furthermore specialized agencies, in general, also assign a similarly low priority to this important sector in their development programmes.

Taking into account all the socio-economic, technical, administrative, organizational, micro- and macroeconomic elements and actions required by Governments, administrations and entrepreneurs at national and subregional level to set up viable industrial units, the industrialization approach was considered, in principle, to be the solution. This solution properly integrated into an African programme of action could trigger a rapid and significant growth of national networks and improve their functioning on a lasting basis.

Local industry could supply adapted equipment, materials and spare parts for maintenance according to expansion needs and frequency of the demand of maintenance services.

However, taking into account the constraints on industrialization such as the present low demand of industrial goods by telecommunication administrations, the industrialization approach did not always appear to find practical support at the national level. Nevertheless, one can envisage regrouping the demand of several countries so as to create favourable conditions for local manufacturing industry.

In its present stage, the African manufacturing capacity in the telecommunication subsector that exists is very limited and represents less than 25 per cent of equipment needs. The majority of needs are therefore met by imports. The problems arising from this overdependence on foreign suppliers could adversely affect network planning, quality of services due to technical constraints and have negative financial and economic consequences.

The presentation showed that as things stood at present, investment on public telecommunication systems contributed in a very significant manner to the increase of the external debt of African states. The industrial development in the subsector would appear therefore to be an important contribution to the efficiency of national and subregional strategies aimed at reducing the pressure of the external debt on the African economy.

The practice of turnkey contracts used by a large majority of telecommunications administrations neither helped to generate the local added value nor to develop local expertise - even within the telecommunications administrations themselves. This practice does not take into account the possibilities of local manufacturing or subcontracting initiatives.

In the discussion, the integrated programme approach introduced by the UNIDO Secretariat in a paper on National Strategies and Policies for a Telecommunications Industry in Africa (Issue Paper I) was broadly accepted. The approach, in order to be effective, would have to be carried out at both national and subregional levels.

Also mentioned were the constraints on industrialization caused by high energy and transportation costs and over-reliance on long-term technical assistance from suppliers. The need to unpackage the technology offered in turnkey contracts was underlined. Standardization of equipment

purchased by telecommunication authorities was one approach but often proved difficult to impose on suppliers due to the low demand of equipment goods at the national level.

Expressed also was the desire to see Governments progressively disengage themselves from the industrial sector, thereby allowing private entrepreneurship, especially SMI's, to flourish. It was nevertheless felt that African Governments must support industrialists in their initial and growing phases by taking appropriate fiscal measures which would encourage investment and future growth.

Several delegates drew attention to additional constraints such as the economic crisis in Africa and the loss of control over both exports and imports and their industrialization programmes. It was however felt that the active and more systematic intervention of African subregional and regional banks would contribute greatly to the development of the telecommunications industry.

Indian Presentation

Considerable attention was given to the example and progress of India in developing its telecommunications and electronics equipment industry. In the Indian view, African telecommunications authorities must convince decision-makers that telecommunications is one of the most important components of infrastructure. India itself had moved telecommunications from a priority level of 63 out of over 260 to 5, the next priority after provision of drinking water. It was also noted that revenues covered 60-70 per cent of investment costs: telecommunications services that ran at a deficit should not expect Governments to provide investment funds. Since telecommunications services could not easily generate foreign exchange, the telecommunications supply industry had to generate the foreign exchange savings for its investment requirements. Africa, like India, would be advised to ignore the conventional criterion of telephone density in its planning, focussing instead on providing access to telecommunications systems to a large section of the population.

By the year 2000, every Indian village would have a public telephone, but the density would still be only 2 per cent. (The Indian delegation's assessment of Africa's telecommunication equipment requirements is reproduced in Annex IV.)

Delegates acknowledged that India's experience showed that it was not possible to develop a country without developing its telecommunications and ancillary industries. Under the aegis of a Technology Development Council, India began the transition to digital technology in 1982 and the establishment of R & D centres both at national and plant level. India had also protected its local telecommunication equipment suppliers with high import tariffs on finished goods, lower ones on components and low duty on raw materials. Local costs higher than the price of imported equivalent goods were initially accepted but brought down to equal them with a phased programme over three years depending on the level of development of the local mechanical engineering, plastics and other industries. Typically a new product may start with 75-80 per cent imported parts. Eventually this would be reduced to zero and the product sold at less than the foreign equivalent.

Much of India's development of electronics equipment, delegates noted, was in the hands of some 1,600 small-scale suppliers. Standardization, quality control and testing centres all over the country supported them with certification of their quality as suppliers to industrial users. The National Research and Development Corporation provides information and transfer of technologies, including telecommunications development, available from national R & D laboratories.

During the course of the Conference an invitation was extended to all African Governments to attend the "Electronics 90 - Exhibition and Conference on Electronics Industries" in New Delhi - India, 9-14 September 1990.

International Organizations

Turning to the international organizations activities to assist the development of an African telecommunications equipment supply industry, the Conference noted with satisfaction the results of the preparatory phase of a major regional feasibility study carried out in 1988 by ITU in consultation with UNIDO. The UNIDO expert, who was also the principal ITU expert for this preparatory phase, reported great interest shown by Governments in developing local manufacture of the materials and equipment required. Intergovernmental organizations, subregional and regional organizations and development finance institutions showed a similar interest and hoped to participate in the regional strategy to promote local manufacture of telecommunications equipment.

Unanimously expressed was the hope that UNDP would allocate the necessary funds, and ITU and UNIDO continue and reinforce their close collaboration for the implementation of subsequent phases.

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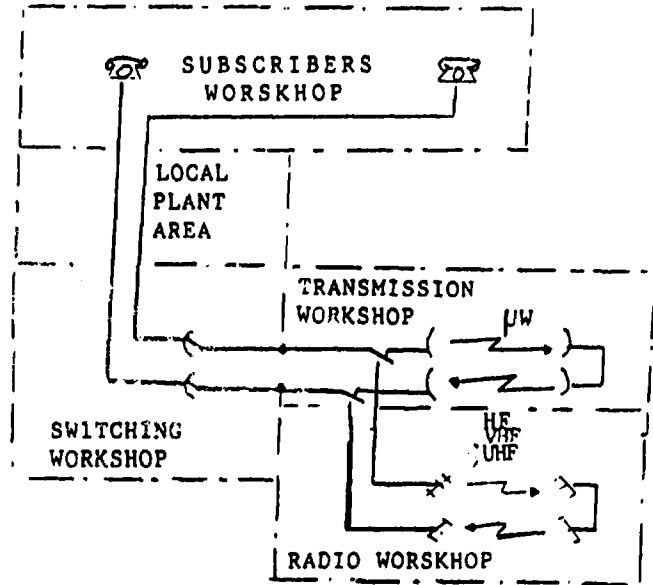
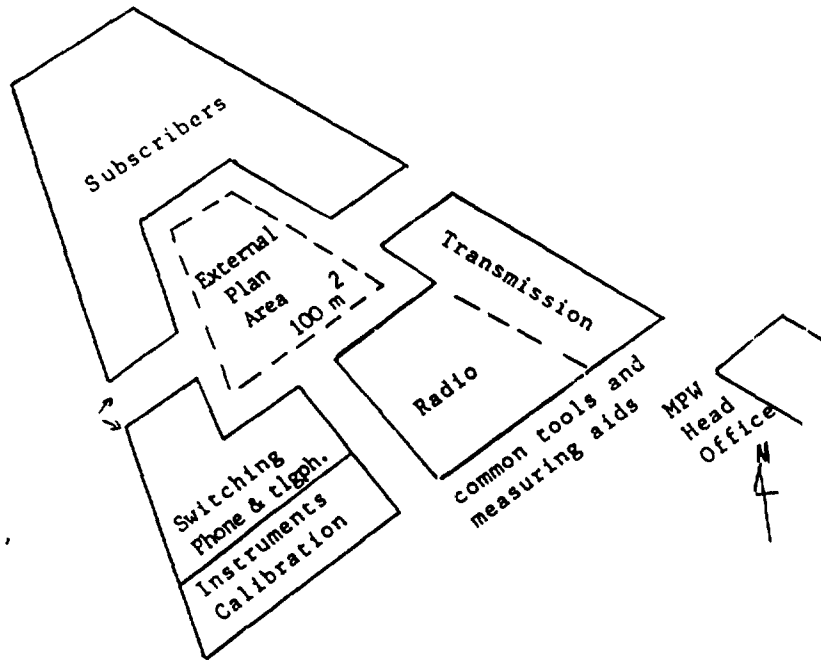
Its concept, methodology, strategy and activities, were outlined by the UNIDO expert and endorsed. Delegates noted that UNDP had already done much to promote telecommunications in Africa, for example in the realisation and maintenance of the PANAFTEL network. Nevertheless, the overall feeling was that more could and should be done by all international organizations.

National Papers

National papers (see list in Annex III) on the status and plans for the telecommunications and equipment supply industries presented by the delegates reflected many of the points made earlier by the UNIDO expert in his introductory remarks (Issue Paper I) and in the papers of the Indian delegation. They dealt with future development of telecommunications services and presented brief outlines of national strategies and policies. They also described the existence of and perspectives for local manufacturing, in particular production of spare parts, telephone sets, cables and local line plant accessories, switching equipment and rural radio equipment. Some national papers also highlighted the need to introduce appropriate and low-cost technologies. A number of presentations emphasized the training possibilities for other African countries, for example the training centre of the PTT in Tunisia, currently attended by trainees from 16 countries.

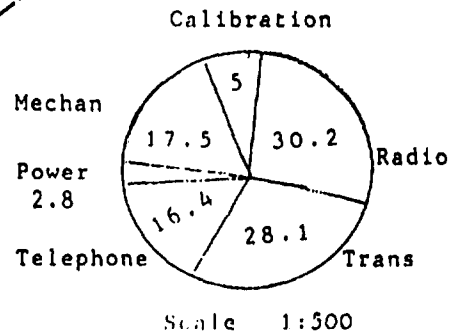
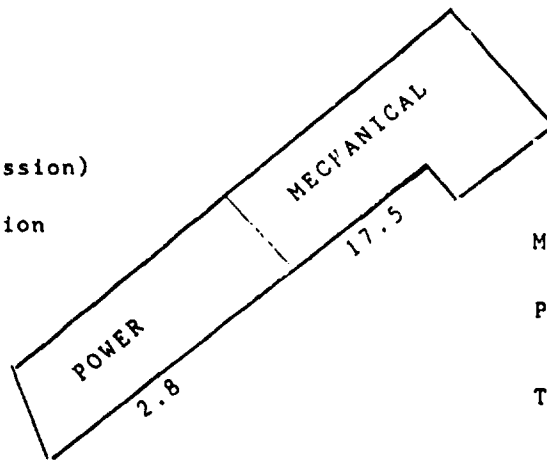
The national papers also contained a number of project ideas and proposals, for example, one to develop instrumentation in Tanzania. The UNIDO Secretariat complemented this with details of 15 proposed technical co-operation projects (see Annex II). Out of these 15 projects, four representative project proposals were presented and discussed by the Conference in detail: manufacture of telecommunications cables in Cameroon, a repair and maintenance centre in Ethiopia (Figure 3), research and development in and manufacturing of lightning protection system for telecommunications equipment in Madagascar, and manufacture of telecommunications cables for Senegal and other member countries of UAPT and ECOWAS. During subsequent discussions, several delegates indicated a strong interest either in participating in the projects or sharing in the results. Cable manufacture in particular, it was emphasized, had to supply a subregional market. Suggestions in that connection included the production in an industrial free zone, and foreign equity participation to compensate higher sales prices with a share of the profits.

FIGURE 3. ETHIOPIAN MAINTENANCE AND REPAIR CENTRE
 PROPOSAL FOR RELOCATION OF THE
 VARIOUS WORKSHOPS
 (ETA)



Advantages:

- initial cost - 12.2%
 (merging Radio and Transmission)
- possibility for easy creation
 of a testing network
 for workshops
 and Training Institute



PROPOSAL
 FOR TESTING NETWORK
 IN THE MULTIPURPOSE
 WORKSHOP
 (MPW)
 Pilot - Project ETHIOP1A

It was further noted that the need to be kept aware of existing technologies together with their transfer to African countries would be a prerequisite for the initial and further development of the telecommunications industry.

Responding to one comment on delays that frequently prevented multi-country projects from getting off the ground, the UNIDO Secretariat replied that cost-effectiveness had to be considered on a long-term basis. Feasibility studies would show when a new venture would become profitable, but the plant has to be operated and managed on a commercial basis. Attention was drawn to the availability of funds and the lack of submitted projects for funding to the African subregional and regional development banks. It was further noted that some national telecommunication authorities were unable to articulate and formulate their needs to the economic or planning commissions for submission to these development banks.

Introducing the possibilities and advantages of developing the telecommunications equipment industry by means of activities at regional and subregional organizations, the UNIDO Secretariat presented the elements of an integrated programme approach at this level (Issue Paper II). The application of an integrated programme approach at subregional level would facilitate the standardization of equipment and procedures, the adaptation of equipment to local environmental conditions through R & D and technology transfer, the group purchasing of equipment and spare parts as well as the establishment of joint manufacturing units in different ways.

ECDC - TCDC

The importance of all forms of South-South co-operation including their sharing of information and technical facilities was broadly supported. In this context, a member of the UNIDO Section for Economic Co-operation among Developing Countries (ECDC) drew attention to the conditions needed for successful industrial co-operation and the possibilities of bringing enterprises from different developing countries in the telecommunications equipment sector together to discuss potential co-operation agreements. Equally there was a potential for technical co-operation among developing countries (TCDC) to provide Governments, institutions, research and training institutions, and enterprises with access to low cost training facilities and expertise. Data banks already existing could help the African telecommunications and equipment industry; new ones could and should be developed.

Referring to the UNIDO regional plan for its assistance to African industry, attention was drawn to the low importance attached to the telecommunications sector in the OAU-ECA-UNIDO programme for the Industrial Development Decade for Africa. This could be remedied in the programme for the second Decade currently being formulated.

Subregional Organizations

The papers presented by the subregional organizations reflected the interest of those bodies in the development of an industrial infrastructure for telecommunications and electronics at a subregional level.

Initiatives by individual countries together with the support from subregional organizations and the assistance of international agencies in the realization of subregional projects in the fields of maintenance, research and development and industrial manufacturing have been raised briefly. Co-operation among member countries of the respective subregional organizations would be the way in which smaller African countries with their limited market sizes can expand their scope for efficient industrialization.

The representative of the PTA expressed the desire to have a closer co-operation with executing agencies in all activities dealing with PTA member states. Similar sentiments were expressed by the other subregional, regional and international organizations present at the Conference.

Private Companies

Presentations made by the representatives of private companies gave a brief outline of their development and production programme. The representatives of Indian companies highlighted the challenges in establishing a telecommunications and electronic industry in developing countries and offered their experience and association with the development programme. The representatives of international manufacturers stressed in particular their world-wide manufacturing approach, the importance of marketing and after-sales services as well as the high financial impact of R & D in the development of new products and in technology. Special emphasis was laid on the approach of establishing joint ventures in developing countries to reduce the risks, to monitor the gradual indigenization of manufacturing and to introduce new designs and technologies. Furthermore, their keen interest in being actively involved in furthering the telecommunications industry in Africa was a sentiment expressed by all manufacturers present.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

National and regional manufacturing potential in Africa is not well known. This means that even products that could be produced competitively by local electronics, electrical, metal working and plastics industries continue to be imported and paid for in foreign currency, which aggravates the foreign debt crisis.

The retarded growth of the telecommunications sector can be partially attributed to unstable network operations, low return on investment, high growth in foreign debt and insufficient skilled labour.

Comparing the situation with that of other regions, the Conference saw the need for greater self-sufficiency through a better balance between local manufacturing activities and the demand for telecommunications services.

It was concluded that a planned and integrated programme approach for the manufacture of telecommunications equipment was needed. This should contain the following main elements: assessment of the needs and market surveys; development of structural links between the telecommunications sector and other better-developed industrial sectors; unpackaging of turnkey projects; establishment of research and development centres; and industrial co-operation at subregional, regional and international levels. In particular, telecommunications master plans should be matched by corresponding industrial master plans.

It was also recognised that the implementation of an integrated programme approach depends on the active participation and strong will of Governments and telecommunication authorities. Governments would have to guide telecommunications, support and co-ordinate the plans and activities of their PTT authorities, existing industry and potential investors. The telecommunications industry would have to be included in national development plans and classified as a strategic industry with a higher priority. Elaboration and harmonization of legislation and investment promotion regulations would be needed to facilitate joint ventures to overcome market and manufacturing limitations. Relative to other infrastructural programmes, more funds would have to be allocated for investment in telecommunications services, with purchasing policies clearly evident in long-term master plans. Specific strategies would have to be developed to ensure subcontracting of certain activities to local companies and encouragement of small-scale industries.

Telecommunications authorities, together with their Governments, would have to decide on strategies to adapt their networks to technological and structural changes, for example to manage the transition from electromechanical to digital technology. Vis-a-vis the rapid growth of the telecommunications industry, the authorities should elaborate clear technical specifications and quality control standards and prepare local tenders to enable local manufacturers to meet their requirements and develop their own capacities.

Existing and potential telecommunications equipment manufacturers would need a two-fold approach for their manufacturing activities: (1) production of spare parts on a small scale; and (2) production of components and equipment on a large scale. Repair and maintenance facilities were recognised as a suitable basis for starting manufacture of spare parts in countries that had not established maintenance centres. These could be extended to multipurpose production units capable of repair and maintenance activities, production of common spare parts, staff training and expert services.

In addition to these essential actions at national level, it was agreed that, to remedy some problems, action would be necessary on several other levels. The appropriate economic groupings and technical organizations and international organizations such as ECA, ITU, OAU, UNESCO and UNIDO all have their respective roles to play. At present there was no co-operation among African countries in manufacturing activities related to telecommunications equipment. It was felt that since countries shared common problems, they could benefit greatly by cooperating in ways ranging from joint planning and manufacturing activities, common information systems, transfer of technologies between developing and developed countries, common training programmes, visits and technical assistance programmes.

Regional co-operation activities between developing countries initiated by existing regional and subregional organizations are limited in the telecommunications subsector. A major thrust at the subregional level would be, however, a UNDP-ITU-UNIDO regional programme for the Governments of African countries to develop the manufacture of telecommunications equipment in Africa.

Regional and subregional organizations together with development finance institutions would need to promote activities to strengthen co-operation between telecommunications administrations. In this connection, Governments and their telecommunications authorities should also take advantage of the

mechanisms and services of ECDC and TCDC programmes available both through the United Nations system and other organizations.

Referring to earlier proposals for a donors' conference to promote investment in Africa's telecommunications equipment industry, the Conference considered that an investors forum would be appropriate during the next two years.

Finally, the Conference recognised that international agencies can play an important role in assisting developing countries in establishing local telecommunication manufacturing units. It emphasized that co-operation among them for subregional projects in Africa was essential in order to avoid duplication. The meeting noted the lack of attention to the telecommunications industry in the OAU-ECA-UNIDO programme for the IDDA. It agreed that telecommunications should be recommended to Governments as a priority item for the second Decade.

Recommendations

The Conference recommends:

1. UNDP to continue its assistance to the regional programme for the Governments of African countries to develop the manufacture of telecommunications equipment in Africa, in particular by allocating funds to the regional project (RAF/87/170) for a feasibility study as soon as possible, i.e., by mid-1990. In this connection, the two agencies responsible for the execution of the project, ITU and UNIDO must maintain and strengthen their co-operation with a view to the rapid and efficient implementation of the project in the framework of an integrated programme of action.
2. African telecommunications administrations through their competent national Government authorities to urge UNDP to continue and to reinforce its assistance to the above regional feasibility study project by allocating the funds necessary for rapid implementation.
3. The African Governments to assign higher priority to the telecommunications sector and the development of an indigenous telecommunications manufacturing industry by:
 - (i) Adopting an integrated programme of action preceded by an assessment of needs and market surveys;
 - (ii) Developing structural links between the telecommunications sector and other industrial sectors;

- (iii) Discourage turnkey projects in favour of local participation;
- (iv) Establishing and reinforcing R & D centres;
- (v) Promoting industrial co-operation at subregional and regional and international levels.

4. African Governments as well as to ECA, OAU, subregional organizations and UNIDO, to take necessary measures so that the development of the telecommunications manufacturing industry be considered a high priority item in the programme of the Second Industrial Development Decade for Africa.

5. Relevant regional and subregional organizations as well as development finance institutions to promote activities:

- (i) To establish and strengthen co-operation between telecommunications administrations to increase their negotiating and purchasing power and pool their resources;
- (ii) To increase the access to and full utilization of available raw materials by local industries;
- (iii) To establish and strengthen the capabilities of telecommunications administrations in the area of repair and maintenance;
- (iv) To create more favourable conditions for use of local, subregional and regional sources of finance for investment programmes; and
- (v) To create conditions to stimulate local production and utilize their member countries' existing industrial capacity.

6. African Governments, together with UNIDO and ITU in close co-operation with ADB, to mobilize financial and other resources for finalization and rapid implementation of all projects conceived, prepared or presented for the Arusha Conference on National Strategies and International Co-operation for the Telecommunications Industry in Africa, taking into account the proposed integrated programme approach for the development of the telecommunications industry. In addition to taking the necessary steps to implement the projects, UNIDO and ITU are requested to report on their implementation to all African Governments.

7. UNIDO and ITU, subject to funding, to support technical and economic co-operation for the development of the telecommunications industry in Africa, specifically by:

- (i) Assisting African attendance and participation in the 'Electronics 90 - Exhibition and Conference on Electronics Industries in India', 9-14 September 1990, with a view to promoting technology transfer projects between the developing countries;
- (ii) Subsequent arrangement of ECDC industrial co-operation meetings at regional or subregional level; and
- (iii) Arranging with UNDP a sectoral TCDC programming meeting for Africa on telecommunications.

8. UNIDO, in particular its INTIB operations, in co-operation with international and appropriate African regional and subregional organizations, to reinforce its information activities concerning development of the telecommunications industry by;

- (i) Developing an ECDC telecommunications technology supply data base;
- (ii) Together with UNDP, strengthening the telecommunications aspects of the INRES-South institutional data base, developing countries' capacities in the area of training, and expertise; and
- (iii) Studying the possibilities of implementing an industrial telecommunications data base for Africa with easy access to a network of existing regional and subregional organizations.

In view of this UNIDO should look into the possibility of organizing a meeting of or contacting otherwise the appropriate organizations dealing with all different aspects of information handling in order to harmonize activities in this field.

9. UNIDO and ITU to assist African telecommunications authorities and their telecommunications equipment industries in their applied research capabilities to raise product quality of telecommunications equipment manufactured locally.

10. UNIDO, in consultation with ITU, and subject to availability of funds, to convene a donors' conference or investors' forum to promote international co-operation to develop the telecommunications industry in Africa towards the end of the regional feasibility study on telecommunications industry.

11. African Governments and their telecommunications administrations, to take steps to adopt appropriate management structures in order to increase efficiency and optimize revenues for reinvestment in the telecommunications sector.

V. PROGRAMME OF ACTION

The Conference on National Strategies and International Co-operation for Telecommunications Industry in Africa requested UNIDO Secretariat to prepare a follow-up programme of action taking into account the conclusions and recommendations of the Conference. The programme of action summarized in Table 1 consists of four inter-related actions each having several activities:

- (a) Action No. 1: ITU/UNIDO/UNDP regional feasibility study on the development of the manufacture of telecommunications equipment in Africa:
- Reinforcing co-operation and co-ordination between UNIDO and ITU for the promotion of the regional feasibility study by holding an interagency meeting within the next two months, where the roles of the respective organizations are defined;
 - Joint action by ITU and UNIDO with UNDP for the allocation of funds for the regional feasibility study in the first half of 1990;
 - Establishment of closer ties with subregional, intergovernmental organizations (ADB, CEEAC, ECA, ECOWAS, OAU, PATU, PTA and SADCC/SATCC), national telecommunications administrations and ministries of industries for the smooth execution of this project.
- (b) Action No. 2: Project promotion and co-ordination:
1. Promotion, co-ordination and implementation of industrial projects by UNIDO in co-operation with subregional, regional and international organizations based upon official requests submitted by African countries especially in the fields of:
 - Promotion and transfer of technology to reduce the widening gap in technology between the developing and industrialized countries due to the fast technological development in the telecommunications and electronics sectors, thereby helping to overcome the problems created by the transition from analogue to digital technology;
 - Multipurpose workshops for repair and maintenance activities and the production of required spare parts of various technological complexities to solve the pressing needs in keeping the telecommunication networks operational, thereby providing more improved and reliable services;

- Research and development with particular emphasis on the adaptation of imported technologies and the modification and testing of equipment and procedures suited to local environmental conditions;
 - Manpower training in specialized fields such as repair and maintenance activities, the production of spare parts and components as well as testing and calibration of imported and locally produced equipment;
 - Manufacturing at national and/or subregional level in the electrical and electronics industry, cable manufacturing, electro-chemistry, metallurgical, plastic, construction and woodwork industries.
- ii. Organization of seminars, in close co-operation with regional and subregional development banks, on the formulation of project documents and the preparation of investment projects.
- iii. Organization of donors/investors forum on telecommunications industry in Africa within the next two years.

(c) Action No. 3: Regional and international co-operation:

Strengthening of regional and international co-operation between countries from different geographical regions as well as with international organizations (ITU, UNESCO, UNDP, UNIDO) in the form of;

- Assistance in African participation in the 'Electronics 90 - Exhibition and Conference on Electronics Industries' in New Delhi, India, 9-14 September 1990;
- Monitoring ECDC industrial co-operation meetings on telecommunications for South-South co-operation;
- Arranging a sectoral TCDC programming meeting on telecommunications for Africa with UNDP to promote technical co-operation and assistance;
- Through the definition of topics for co-operation, the presentation of projects to interested parties and sponsoring of study tours ECDC/TCDC activities would promote technology transfer, enterprise to enterprise co-operation, joint investment projects, etc.

(d) Action No.4: Establishment/extension of information data banks:
Establishment and/or extension of information data banks, in particular to:

- Reinforce UNIDO's INTIB and TIES information systems giving greater coverage to the telecommunications sector;
- Strengthen UNDP-INRES-South institutional database as part of the TCDC activities on training, research and expert capabilities of African institutions;
- Establish ECDC-TCDC telecommunications technology supply database using the growing range of suitable technologies available in developing countries and providing low-cost, small-scale solutions to some of Africa's industrial problems;
- Study the possibilities of setting up a telecommunications database for Africa which would take into account the particular economic and geographical situation of African countries;
- Monitor technologies related to telecommunications and publication of these to increase the awareness of telecommunications to Governments, development banks, institutions and organizations.

Table 1. SUMMARY OF PROGRAMME OF ACTION

Objective	<u>Action No. 1</u>	<u>Action No. 2</u>	<u>Action No. 3</u>	<u>Action No. 4</u>
	Regional Feasibility study	Project Promotion and co-ordination	Regional and International Co-operation	Establishment/Extension of information Databanks
Intervention by	ITU/UNIDO/UNDP	African Countries/ subregional/regional/ organizations UNIDO/ITU	African countries UNDP/ITU/UNIDO/UNESCO Developed and other developing countries	African Countries/subregional/ regional organization UNIDO/ECDC/UNDP/ITU
Activities	1.1 - Co-operation and Co-ordination meetings between UNIDO and ITU within the next two months 2.1 - Allocation of Funds by UNDP 2.2 - Execution of Feasibility study	2.1 - Official requests in the field of: 2.1.1 Promotion and transfer of technology 2.1.2 - Multipurpose workshops for repair and maintenance 2.1.3 Research & Development 2.1.4 Training 2.1.5 Manufacturing 2.2 - Country Visits 2.2.1 - Mission reports 2.3 - Mobilization of Funds 2.4 - Implementation 2.5 - Report on Implementation to African Governments 2.6 - Results 2.7 - Seminars on preparation of investment projects 2.8 - Donors/Investors Forum (within the next two years)	3.1 - Assistance in African participation to "Electronics 90 Exhibition and Conference on Electronics Industries" in New Delhi-India Sept.9-14 1990 3.2 Definition of topics for co-operation 3.3 - Presentation of projects to promote technology transfer 3.4 - Sponsoring of study tours for transferring technology at regional and subregional levels 3.5 - Industrial Co-operation Meeting-arrangement by ECDC at regional and subregional levels 3.6 - Sectoral TCDC programming Meeting for Africa on Telecommunications	4.1 - Co-ordination 4.2 - Extension of existing data banks towards telecommunications and related industries UNIDO - INTIB - TIES 4.3 - ECDC telecommunications technology supply data base 4.4 - UNDP - INRPS South Institutional data base 4.5 - Establishment of Industrial telecommunications data base for Africa 4.6 - Monitoring of technologies related to telecommunication and publication of these for awareness purposes

ANNEX I

**CONFERENCE ON NATIONAL STRATEGIES AND INTERNATIONAL
CO-OPERATION FOR THE TELECOMMUNICATIONS
INDUSTRY IN AFRICA**

**ARUSHA, TANZANIA
11 - 15 DECEMBER 1989**

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Annex II

List of Project Proposals

1. **Cameroon:** Manufacture of telecommunications cables
Promotor: Cablerie Equatoriale
B.P. 411 Douala
2. **Cote d'Ivoire:** Manufacture of telephone instruments
Promotor: Société Africaine de Fabrication d'Equipments
Telephoniques
B.P. 4166 Abidjan 01
3. **Egypt:** Manufacture of electronic and microelectronic
components
Promotor: undefined (joint venture between foreign and
local partners)
4. **Egypt:** Manufacture of telecommunications cables
(diversification of production)
Promotor: Egyptian Electro Cables company
P.O.Box 208, Cairo
5. **Ethiopia:** Multipurpose Workshop for repair and
maintenance (pilot project)
Promotor: Ethiopian Telecommunications Authority
6. **Ethiopia:** Manufacture of telephone instruments,
materials and electronic equipment
Promotor: Ministry of Industry
7. **Madagascar:** Research and Development Centre for the
protection of equipment against lightning
Promotor: National Laboratory for Telecommunications
Research (LNRT) - Telecommunication
Administration
8. **Senegal/Member**
countries of UAPT: Manufacture of telecommunications cables
Promotor: Union Africaine des Postes et
Telecommunications (UAPT) and Banque Ouest
Africaine de Developpement (BOAD)
9. **Zambia:** Regional electronic repair centre
Promotor: Post and Telecommunication Corporation
10. **Zimbabwe**
Promotor: Repair workshop for digital technologies/
circuit cards
undefined
11. **Zimbabwe:** Manufacture of blank boards for PCB
Promotor: Post and Telecommunications Corporation
12. **Zimbabwe:** Manufacture of didactic systems for electrical
engineering
Promotor: University of Zimbabwe
13. **UDEAC:** Regional Centre for maintenance and repair of
telecommunications equipment
Promotor: UDEAC with ITU's co-operation
14. **UDEAC:** Prefeasibility and feasibility study for
manufacture of telecommunications equipment in
the Central African region
Promotor: UDEAC

15. **Mozambique:** Extension of telecommunications R & D Centre
Promotor: P & T Administration
16. **Senegal:** Maintenance and Repair Workshop
Promotor: SONATEL (Telecommunication Administration)
B.P.69 - Dakar
17. **Kenya:** Maintenance and repair workshop and R&D centre
Promotor: Kenya P & TC
18. **Togo:** Subregional Maintenance Centre
Promotors: UAPT, ECOWAS, PATU, Nigeria, Togo

List of Project ideas

- 19 **Zimbabwe:** Plastic manufacturing
Promotor: undefined
20. **Zambia:** Manufacture of telephone instruments
Promotor: undefined
21. **Zambia:** Multipurpose production workshop for repair
and maintenance
Promotor: ZPTCL
- 22 **Zambia:** Manufacture of telecommunications accessories
Promotor: undefined
23. **Chad:** Multipurpose workshop for repair and
maintenance
Promotor: Telecommunications administration
24. **Cameroon:** Assembling unit for magnetoscope and
microcomputer
Promotor: IEC
25. **Cameroon:** Test and quality control laboratory for
telephone instruments
Promotor: IEC
26. **Egypt:** Training programme for board mounting of
electronic components
Promotor: Egyptian Telephone Company (ARENTO)
27. **Egypt:** Creation of application centre of videoscope
technology for electronic consumer goods
Promotor: Egyptian Micro Electronics
28. **Nigeria:** Manufacture of telephone switches
Manufacture of telephone instruments
Manufacture of rural radio equipment
manufacture of spare parts for analogue
equipment
Promotor: NITEL and Private companies
- Subregional level: Manufacture of low cost radio and TV receiver
sets with solar cells
- Manufacture of equipment for news agencies and
print medias
Promotor: undefined, UNESCO/UNIDO assistance

ANNEX III

List of Documents

1. **Aide-Memoire (English & French)**
2. **Issue Paper I (National Strategies and Policies for a Telecommunication Industry in Africa) (English & French)**
3. **Issue Paper II (Regional and International Co-operation for a Telecommunications Industry in Africa) (English & French)**
4. **Background Paper to Issue Papers I & II**
5. **List of Projects**
6. **Project Document No. RAF/88/ - Regional Programme for the Governments of African Countries (ITU/UNIDO/UNDP)**
7. **Synthesis of Activities of Technical Preparatory Meeting on Telecommunications Industries in Africa**
8. **Mission Report on Telecommunications Industry in Egypt**
9. **Mission Report on Telecommunications Industry in Zimbabwe**
10. **Country Profile - Tanzania**
11. **Le Secteur des Télécommunications au Maroc**
12. **Etude nationale dans le domaine des industries des telecommunications - Tunisie**
13. **Country Profile - Nigeria**
14. **Etude nationale dans le domaine de l'industrie, des télécommunications - Cameroun**
15. **Presentation from Communication Systems of Zimbabwe Limited**

16. Presentation from Arab Republic of Egypt National Telecommunications Organization (ARENTO)
17. Abstract on Challenges of Establishing Telecommunication/Electronics industry in a Developing Country GCEL - A Reference for Africa
18. A Study on the Development of a Regional Manufacturing Strategy for the SADCC Region - by HN Engineering
19. Prospect for the Assembly/Manufacture of Telephones in Zimbabwe - by Posts and Telecommunications Corporation (PTC)
20. Contribution by Zambia Posts and Telecommunications Corporation Ltd.
21. Dossier de Contribution - Tchad
22. Memorandum sur la participation Rwandaise a la conference pour l'industrie des télécommunications en Afrique
23. Perspective de Developpement des Industries et Services des Télécommunications en Tunisie
24. Conference sur les Strategies Nationales et la Cooperation Internationale pour l'industrie des Télécommunications en Afrique - Union Africains des Postes et Telecommunications (U.A.P.T.)
25. UNESCO Paper for the UNIDO Conference on National Strategies and International Co-operation for Telecommunications Industries in Africa
26. Fiche de projet relative a l'implantation des unites de fabrication d'equipments de Télécommunications en UDEAC
27. The Tanzanian Telecommunications Industry: The R & D Institutional Outlook for Capability Building in the Sector. Tanzanian Industrial Research and Development Organization (TIRDO)
28. Point de vue de Secretariat Général de l'U.D.E.A.C. (Union Douaniere et Economique de l'Afrique Centrale)

29. Indian Country Paper - Y. L. Agarwal - Telecommunications Consultants India Ltd., New Delhi, India
30. African Regional Standardization Organization - Presentation
31. Electronics Industry in India: A Review prepared by R.K. Seivastava, Department of Electronics
32. Apercu de la Politique d'industrialisation des Télécommunications à Madagascar
33. Quelques Information sur l'Approche de la Direction des Télécommunications sur le developpement de Materiels de Télécommunications - Madagascar
34. Société Nationale des Télécommunications du Senegal - contribution SONATEL/Senegal
35. Presentation de Industrial Electronics Cameroun, IEC, Cameroun

ANNEX IV

ASSESSMENT OF TELECOM EQUIPMENT REQUIREMENTS
IN AFRICA OVER THE NEXT TEN YEARS

1. DIGITAL SWITCHING SYSTEMS

Present installed capacity	4.5 Million Lines
Rate of anticipated growth per annum	10%
Capacity at the end of 10 years	11.65 Million Lines
Increase in capacity expected	7.15 Million
Expected requirement of switching equipment :	
Less than 500 lines capacity (15% of total)	1.75 Million
Between 500 - 5,000 lines (25% of total)	2.91 Million
Above 5,000 lines (60% of total)	5.99 Million

2. EXTERNAL PLANT

Underground cable @ 12 ckm/line	85.8 Million ckm
Post material @ 3 posts/line	21.45 Posts
Drop Wire @ 0.2 km/line	1.43 Million km

3. TRANSMISSION SYSTEMS

i) **Terrestrial Systems :**

Rural

MARR 1,000 systems with average of 6 subscribers

VHF 8,000 hops

UHF 2,000 hops

Urban

34 Mbps systems 2,000 hops

140 Mbps systems 500 hops

ii) **Satellite systems :**

Rural earth stations of small capacity 1,600

Urban earth stations of medium/large capacity 200

iii) **PCM equipment :**

18,000 systems of 30 channel capacity with second and higher order MUX comprising 14,000 systems for long distance transmission and 4,000 systems for junctions for local telephone systems.

iv) **Subscribers apparatus :**

New Connections 7 Million

Replacements 3 Million

Total 10 Million

4. GENERAL REQUIREMENTS

- i) Power plant for telephone exchanges :
 - Small capacity 3,500 Units
 - Medium capacity 582 Units
 - Large capacity 1,000 Units

- ii) Power plants for transmission systems :
 - Small capacity 30,000 Units
 - Medium capacity 4,500 Units
 - Large capacity 1,000 Units

- iii) Broadcast TV and sound :
 - TV receive only terminals 1,000 Units
 - Direct receiving sets 10,000
 - Radio networking receive only equipment 2,000

- iv) Metrology :
 - Data collection platforms 1,000
 - Disaster Warning Systems 1,000

SOURCE: Indian Country Paper
prepared by Mr. Y. L. Agarwal
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