

UNITED NATIONS ECONOMIC and SOCIAL COUNCIL

Distr.
LIMITED
E/CN.14/TEL/8
18 February 1972
Original: ENGLISH



50513

ECONOMIC COMMISSION FOR AFRICA

OPERATIONAL EFFICIENCY AND CURRENT DEVELOPMENT IN TELECOMMUNICATIONS IN THE ECA REGION

1. This paper presents an assessment of the efficiency of telecommunication services in Africa. In the absence of adequate statistical information this effort will be confined to a general review of the efficiency without detailing the various areas where improvement might be considered necessary.

Fixed Service

2. Developing countries are under pressure to develop their telecommunication services; and this is made more obvious on examining the few figures that can be gleaned from situation reports on some of the existing services. The table below gives such a picture for the year 1969.

Table 1

Country	No. of Direct Exchange lines (D.E.L.)	Total No. of Telephones	No. of Telephones No. of D.E.L.
Ethiopia	28,000	41,106	1.5
Kenya	33,569 ^{a/}	72,277	2.1
Mauritius	10,595	16,793	1.6
Tunis	42,365	68,908	1.6
Swaziland	1,988 ^{a/}	4,822	2.4
Zambia	20,454 ^{b/}	47,735	2.3

Source: P.T.T. Administrations' Annual Reports.

^{a/} 1970 figure. ^{b/} 1968 figure.

^{c/} Kenya Ministry of Finance Economic Survey, 1971.

3. The ratio of total number of telephones to the direct exchange lines is very high for all the countries shown on the table. This is possibly common to the majority of the countries of the region. Such high ratios of extension lines require very high switching capacities in the main exchanges, the lack of which causes congestion and loss of calls.

Table 2 - Telephone Installed and Waiting List 1969

Country	Number of Telephones	Waiting list	Percentage of waiting applicants to no. of telephones in use
Botswana	3,536	300	8.4
Burundi	3,155	26	0.8
Cameroon	5,000	-	-
Congo	9,812	900	9.2
Ethiopia	41,106	706	1.7
Ghana	45,850 ^{a/}	-	-
Madagascar	25,258	70	0.3
Malawi	11,519	202	1.8
Mauritius	16,793	990	5.8
Morocco	153,662	1,000	0.6
Swaziland	4,822	462	9.5
Tunisia	68,908	1,395	2.0
Zambia	47,735	4,148	8.6

Source: P.T.T. Administrations.

^{a/} 1968 figure - - figures not available.

4. The waiting list based on the actual number of applications for telephones pending at the end of 1969 as indicated by PTT Administrations is shown in Table 2 above. The average unsatisfied demand is about 5 per cent. In practice, the demand is much higher as most potential subscribers will not apply for telephone connexions until they are sure they have a reasonable chance of getting one. The ratio of the waiting applications to the total number of telephones is an indication of the disappointment of businessmen and the general public who wait patiently, in many cases for years, for telephone service.

Table 3

Country	No. of Telephones	No. of Tele- phones in principal cities	No. of local calls 1000	Percentage of city to total	No. of calls per telephone
Algeria	169,188	101,024	141,335	60	830
Burundi	3,415	3,415	5,751	100	1,600
Cameroon	5,852	-	5,467	86 ^{b/}	930
Congo	9,812	9,298	8,415	95	850
Ethiopia	41,106	33,326	62,535	81	1,500
Gabon	6,694	-	3,061	-	450
Gambia	1,586	682	1,161	43	730
Ghana ^{a/}	45,850	37,347	32,578	81	710
Ivory Coast ^{a/}	24,811	21,623	25,500	87	1,000
Kenya	72,277	52,390	87,890	72	1,200
Libya	34,790	27,360	31,311	79	930
Madagascar	25,258	15,618	23,840	62	940
Niger	3,298	2,440	3,115	74	940
Nigeria	81,440	46,353	88,730	57	1,000
Rwanda	1,433	-	1,122	-	780
Senegal	29,264	-	19,982	-	680
Swaziland	4,822	2,117	3,695	44	760
Tanzania	31,587	13,726	34,449	43	1,000
Togo	4,567	-	5,212	-	1,100
Uganda	27,666	17,028	39,290	62	1,400
Upper Volta	1,398	1,153	2,097	82	1,500
Zaire	22,092	10,425	149,358	47	6,700

Sources: P.T.T. Administrations and the World's Telephones.

^{a/} Only 1968 figures available. ^{b/} 1968/69 figure based on the annual bulletin of statistics from the Ministry of Posts and Telecommunications.

5. From Table 3 may be seen that in 1969 the proportion of telephones in the big cities, in relation to the total number in the country in most countries of the region on which information was available, was very high. The percentage varied between 43 and 100, and averaged about 70. From the point of view of harmonious development of the whole country a 50 - 50 distribution in urban and provincial areas is considered a satisfactory target.

6. The potential for long-distance service, both domestic and international is great. The relative quickening of the pace of industrialization, as well as expansion in agriculture and trade, have been largely responsible for the growing demand but there seems to be shortage of channels for long-distance service. The position as at the end of 1969 is reflected in Table 4 below.

Table 4

Country	No. of trunk calls per telephone	No. of calls per trunk	No. of calls per trunk per average working day
Burundi	1,327	-	-
Cameroon	27	-	-
Congo	878	200,450	668
Ethiopia	68	-	-
Ghana ^{a/}	178	7,046	23
Madagascar	32	2,137	7
Malawi	50	1,162	4
Mauritius	327 ^{b/}	-	-
Morocco	1,231 ^{b/}	-	-
Swaziland	266	107,378	358
Tunisia	359	24,283	81
Zambia	1,119	156,676	522

Sources: P.T.T. Administrations and the World's Telephones.

a/ 1968 figures. b/ including local calls.

7. It is hazardous to generalize in the absence of adequate information: it could however be said that the figures of calls per trunk, on the whole, indicate congestion in a substantial number of the countries about whose services some information was available. This congestion may well be representative of the majority of countries of the region.

8. Long distance service is very remunerative in terms of revenue yield in relation to investment. Provision of backbone routes and the introduction of subscriber trunk dialling STD may well meet existing demand, generate sufficient revenue to justify investment and maximize the utilization of the network. The extent of investment for each country can only be judged after proper study of the traffic. The ultimate solution may be by planned extension of network capacity all over the country up to the stage when the inevitable STD system can be introduced. The earlier the stage is achieved, the better it is for the financial health of the telecommunications authority and for the economic development of the country.
9. In a number of countries of the region, the telegraph service is quite important and extensive. Generally, however, its development over the last decade has been much slower than the telephone service. This is understandable in less literate societies, where the spoken word dominates. This difficulty is aggravated by the lack of some service in the national language. The poor delivery systems and the need for extensive automation also contribute to the lack of popularity of the telegraph services generally. More extensive development of the teleprinter would help the growth of the telegraph service: at present the teleprinter service is available only at the large centres and on a point-to-point basis.
10. A telex network is a natural off-shoot of the telephone network since telex channels are multiplexed off telephone voice channels. And like the telephone service, telex services in the countries of the region have been showing considerable expansion. Table 5 shows telegraph and telex development for the few countries of the region from whom information of some reliability were obtained. The relatively encouraging development of telex is not unexpected in view of the clear advantages of telex for organizations such as national banks, nation-wide businesses, and airlines. Apart from its economy, its continuous 24 hours a day service is an attraction. A higher rate of growth of the telex service in each country with the expansion and efficient operation of domestic telephone networks should be expected.
11. The H.F. link continues to be the dominant mode of communication between remote areas of the same country for some countries of the region. In most countries however, for special services such as civil aviation, the military and police, it is still the main means of long distance communication. Many of these H.F. links are being replaced by SHF, UHF and VHF systems except for areas with sparse traffic and or difficult accessibility. Similar development may be expected in the future for intra regional traffic with the introduction of the pan African network. The advent of the fixed service satellite for inter continental traffic, has also pushed the HF communication link to secondary status. The replacements of these HF links in the countries that still depend on them as primary communication channels must be subjected to long-term and careful planning if the change over is to be most beneficial.

Table 5 - Telegraph and Telex Development

Country	No. of telegrams		No. of telex exchanges and subscribers				% increase of telegrams	% increase of telex subscribers
	1968	1969	1968		1969			
			Exchanges	Subscribers	Exchanges	Subscribers		
Cameroon	-	334,372	-	151	-	166	-	10
Ethiopia	-	-	-	131	-	153	-	17
Madagascar	68,061	695,858	160	67	180	94	2.3	40
Morocco	849,870	863,053	-	701	980	786	1.5	12
Swaziland ^{a/}	72,826	85,428	-	27	-	34	17	26
Tunisia	406,039	453,407	-	-	481	241	12	-
Upper Volta ^{a/}	76,650	99,545	-	25	-	34	30	36
Zambia ^{b/}	11,629,998 ^{c/}	14,202,270 ^{c/}	206	117	236	192	22	64

Source: P.T.T. Administrations.

a/ Figures are for 1969 and 1970.

b/ Figures are for 1967 and 1968.

c/ Number of words.

Broadcasting Service

12. With the advent of national television transmission networks some countries in the tropical areas of the region, whose primary nationwide sound broadcasting services are based on HF, are beginning to give serious thought to VHF sound broadcasting networks in preference to both HF and MF. In addition to the better quality broadcasting, there is the advantage of better utilization of manpower to be gained by co-siting VHF sound and television transmitters. However, until the cost of the VHF receiver can compare favourably with current prices of medium wave or HF/MF domestic receivers, the rate of change over to VHF sound broadcasting cannot be expected to be significant. The introduction of microwave links, with adequate provision for music circuits, has improved the techniques and quality of broadcasting in countries where advantage has been taken of these facilities to introduce broadcast programmes from sources outside the studios into the general daily fare. In countries of the region where the broadcasting engineering and the telephone national organizations are separate entities, there is an obvious need for closer co-ordination of development, if unnecessary and costly duplication of facilities is to be avoided. It is generally estimated that a saving of as much as twenty to thirty per cent of investment costs can be achieved in a well-co-ordinated and engineered national telecommunication network common to all user national organizations.

13. For international and inter-continental sound broadcasting, HF will continue in strength as there seems to be little prospect of sound satellite broadcasting ever taking off in view of more important claims by other services including television, for scarce frequencies.

14. There is an obvious need for a regional telecommunications organization in which all national telecommunication organizations operating fixed broadcasting and other major services will be represented for the expressed purpose of co-ordinating plans not only of terrestrial pan African network but also, for example, of satellite broadcasting.

Financial Efficiency

15. Financial efficiency in a telecommunications organization is as equally important as technical efficiency. Telecommunications organizations usually give good returns on investments if managed efficiently. In the region at present most telecommunication organizations are operated as rigidly as government departments, and with financial control vested elsewhere. The accounting systems used are essentially simple, of the non-business-like type, and generally not giving enough information of use for assessing profitability.

16. Table 6 shows net revenue in relation to total expenditure and capital invested for some countries of the region for the year 1969. Regrettably, the available figures are not adequate enough to deduce any general comprehensive picture of financial management.

Table 6

Country	Total expenditure in US\$	Excess of revenue over expenditure in US\$	Capital invested in US\$	Percentage of net revenue to expenditure	Return on capital invested
Congo	4,364,881	4,335,645	-	99	-
Ethiopia ^{a/}	5,847,770	1,659,525	7,750,936	28	21
Morocco	20,312,125	8,346,651	-	41	-
Madagascar	16,022,198	902,000	-	6	-
Mauritius ^{a/}	676,922	340,048	-	50	-
Tunisia	2,565,496	1,248,411	-	49	-
Zambia ^{b/}	10,827,066	2,814,997	28,143,676	26	10

Source: Post and Telecommunication Administrations.

a/ Figures exclude posts. b/ Figures are for 1968.

17. Without some corresponding information on the telecommunication tariff imposed by the authority the net revenue gives no indication of financial efficiency of the operation. There are no tariff figures available at present but these are known to be generally high for most countries of the region.

Administrative Structures

18. Government undertakings are generally less sensitive to public needs, and are slow of development because of the tendency to administrative rigidity and statutory financial control. In view of the fact that monopolistic public utilities such as telecommunication services need to operate efficiently and with regard to public needs, it is advantageous for them to be organized into autonomous public corporations with authority to raise funds and with complete administrative and financial control over all expenditure. This autonomy may, however, be qualified by the provision of a safeguard for the supervision of public funds.

19. A national telecommunication corporation of this kind should include all national telecommunications services such as the fixed services (telephones and telegraphs) broadcasting (radio and television engineering) among others, and should be entrusted among other responsibilities with providing communication channels for other users. Administrative and financial autonomy of the kind advocated is essential for a national single telecommunications authority because of the need for long-term planning of services.

Training

20. The science of telecommunication is increasing in complexity, and it is becoming ever more urgent that all the important fields of telecommunications services should be staffed with qualified engineers and technicians. To ensure maximum efficiency, training is required in administration, management, and financial control. Except for a very few countries of the region, existing training is predominantly elementary. There are plans for upgrading levels of courses in the relatively few training establishments to the intermediate grade but much is required to be done to improve training techniques, attract and retain some of the good products of the few higher colleges, and introduce advanced courses in the new communication technologies. Side by side with stepped-up efforts at personnel development, assistance should be sought through such agencies as the United Nations in providing for field missions of experts to assist in improving maintenance and operational techniques and in laying down basic standards and norms for fault control and maintenance.

21. As can be seen from Table 7, large numbers of personnel are still employed in telecommunication organizations.

Table 7 - Staff Employed in Telecommunication Organizations in Some Countries of the Region (1969)

Country	Technician and Artisan level		Engineering and Managerial		Operative, accounting and administrative		Total per 1000 telephones
	Total	Per 1000 telephones	Total	Per 1000 telephones	Total	Per 1000 telephones	
Ethiopia	-	-	-	-	-	-	74
Mauritius	322	19	10	0.6	143 ^{b/}	9	28
Morocco	-	-	-	-	-	-	35
Swaziland	36	7	1	0.2	92 ^{b/}	19	27
Tunisia	-	-	-	-	-	-	27
Upper Volta ^{a/}	-	-	-	-	-	-	365
Zambia ^{a/}	-	-	-	-	-	-	43
							3,036
							475
							4,362
							129
							1,886
							510
							2,111

Source: Post and Telecommunications Administrations.

^{a/} Including postal services. ^{b/} Excluding accounting and administrative staff. * 1968 figures.

22. From the available information, it may be seen that in some countries of the region the numbers of personnel of all categories per 1000 telephones is as high as 365. Would there had been more information forthcoming on the relevant categories of staff and their system of classification; the feeling however is that the total staff strengths contain a high percentage of operatives, accounting and administrative staff. It need hardly be stressed that although this state of affairs can be rationalized away, in developing countries bothered by unemployment problems, there is the need to be reasonable with limits of underemployment . Phased automation - not mere introduction of a computer service for the calculation of bills - can help upgrade operational efficiency and profitability.

- - - - -