

A View of
Telecommunications
in Zaire

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PERSPECTIVES ON TELECOMMUNICATIONS IN ZAIRE

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1.0 INTRODUCTION

The Republic of Zaire is the third largest country on the African continent with 2,345,000 square kilometers and one of the most populous countries with over 41 million inhabitants. For over a decade, the country has faced several serious economic and political challenges which have affected the prospects of this otherwise resource-rich country. In 1990, Zaire's Gross Domestic Product (GDP) was estimated at US\$211.93 million and its Gross National Product (GNP) per inhabitant was US\$194.

This chapter will discuss the development of Zaire's telecommunication sector. The state of telecommunications in Zaire as of the mid-1990's will be presented and the obstacles for further development will be assessed. The conclusion provides broad recommendations for improving the current state of telecommunications and for moving Zaire's telecommunications sector into the 21st century.

2.0 Colonial Period

Telecommunications technology was introduced during the colonial period solely

for the colonial power and its administration. The Belgian Congo was a region of intense economic activity, and because the productive units were scattered considerable resources were placed into telecommunications (relative to other African colonies). The telecommunications system linked the several production units within the Belgian Congo and the capital Leopoldville now called Kinshasa. The Belgians invested in infrastructure expecting the country to remain a colony. The events of 1959-60 went against all Belgian expectations.

3.0 Post-Independence

Zaire gained its independence in 1960. Telecommunications was placed under the administration of the National Office of Zaire for Post and Telecommunications (the ONPTZ). Having had no role in the development of the system, however, and no experience in technology or management, the newly independent nation and its citizens did not realize the importance of telecommunications for social and economic development. During the 1960s and the 1970s, for example, children were still making toys out of the wires used for telecommunications. Further, the lack of political stability during the post-Independence era resulted in a discontinuity of telecommunications development. Subsequently, there has been no strategy for thirty years, i.e., each administration restarted the same telecommunications projects. Since independence, ONPTZ has continuously

blamed the poor service on the antiquated and obsolete equipment it is forced to use. While this is partially true, other questions must be answered.

When the telecommunications data from 1980 to 1988 is examined, it is evident that while the network was antiquated, it was still underutilized. In 1985, the number of telephones was 38,845. By 1988, these figures had dropped dramatically except the number of major lines, which grew from 29,010 to 29,186. With respect to traffic volume, 1985 was the year with the greatest volume: for national calls, volume changed 786.3 % (1,604,000 more calls) over 1980; 598 % (or 1,549,000 calls) over 1982; and 343 % (or 1,400,000 calls) compared to 1988. Thus, there is considerable room for increased utilization of the current network. The Government invested an estimated US\$33.1 million in telecommunications infrastructure in 1988 and employed 6.75 (± 0.025)% of the population in the telecommunications industry. According to the ITU, the number of main lines in Zaire increased from 26,600 main lines in 1980 to 29,186 in 1988. Meanwhile, the number of Consumer Premise Equipment (CPE) connected jumped from an estimated 27,300 in 1980 to 38,845 in 1985, only to fall back down to 32,116 in 1988.

In the early 90's, the following telecommunications development projects were underway:

- a. installation of 8,000 lines for the town of Kinshasa, divided into four

digital telephone exchanges using system S 1240. (Financed by Belgium for a total cost of 350 million Belgian francs. Supplier: Alcatel-Bell telephone);

b. installation of two central telephone exchanges with 9,000 lines, one in Kinshasa with 6,000 lines and the other in Kisangani with 3,000 lines. (Financed by Italy with a US\$9.3 million fund. Supplier: Alcatel-Siette);

c. installation of a digital microwave system with large capacity (34 megabits per second) linking Kinshasa to the port of Matadi and serving the towns of Kasangulu, Inkisi, Mbanza Ngungu, Lufutoto, Tmba, Lukala, Kimpese, and Songololo. (Financed by France for a cost of 20.5 million French francs. Supplier: Alcatel-ATFH).

The following telecommunications projects were announced:

a. the construction of a trunk network associated with the four telephone exchanges mentioned above. (Financing by Belgium for 368 million Belgian francs of which 100 million was agreed on for the first phase. Supplier: Belca);

b. acquisition of exchanges and trunk networks in Bukavu, Gbadolite, and Goma. (Financing by Italy for US\$15.4 million. Supplier: Alcatel - Siette);

c. study of the reorganization of telecommunications at the national level. (Financing by the World Bank for US\$750,000. Execution agent: Tracte-Bell);

d. implementation of the completed studies for the restoration of the telecommunications network of the town of Kinshasa and the restructuring of the ONPTZ at a cost of US\$80 million.

In 1991, ONPTZ began using Intelsat's Planned Domestic Service to extend service to the rural areas via a 36 Mhz bandwidth leased transponder and 14 standard Z earth stations supplied by Telespace of France. Zaire's uses microwave relay links for as national trunks and international links to neighboring countries.

Microwave relay links were utilized along the following routes:

Kinshasa - Mbanza Ngungu - Matadi

Lubumbashi - Likazi Kolwezi (in good condition)

Goma - Bukavu - Uvira

Bukavu - Cyangugu (Rwanda)

Lubumbashi - Tshingolo

Kinshasa Brazzaville (Congo)

Kananga - Mbuji Mayi (in good condition)

Thus, by the early 1990's, ONPTZ was making some headway in improving and expanding telecommunications service. The political troubles of the early 1990s imperilled these projects. Demand was clearly shone: in 1993, for example, 10,420 were on the waiting list even as line capacity increased by over 70% from 30,000 lines in 1988 to 51,000 lines in 1991.

4.0 THE PRESENT

4.1 Domestic Telecommunications

Despite the improvements that have occurred, in the mid-1990s, it was still extremely difficult to make a call from Kinshasa to Bukavu--a distance of 2,000 kilometers, and telephone calling between Bukavu and Goma--only 200 kilometers away--was impossible.

Further, telecommunications continue to be plagued by the same problems that cripple the rest of the country's public sector: inflation and nonindexed salaries leads to personal entrepreneurship of individuals. For example, communications with Europe are often sold by individuals with access to a business line, by charging others for use of their phones. Similarly, some ONTPZ employees sell minutes or hours of international calls to private individuals. These calls are then undertaxed and the money is divided between the participating employees.

In 1993, Zaire's minister of telecommunications presented an urgent priority plan that concerned the city of Kinshasa, the ten regional capitals, the town of Gbadolite, some other important towns, and the PANAFTEL (Pan-African Telecommunications) project. In this program, the qualitative and quantitative objectives of the restoration and modernization plan for Zaire's telecommunications were defined as follows:

- a. attain 100,000 telephone lines by the end of 1995, compared to 34,000 at the end of 1993;¹
- b. attain 4,000 telex lines by the same date;
- c. link Kinshasa, the capital, with all the regional capitals through an efficient transmission system;
- d. link Zaire to all the neighboring countries by microwave relay links;
- e. improve the quality of service by installing new central telephone exchanges and some new cable networks to replace the antiquated ones;
- f. reorganize the satellite telecommunications service and build several terrestrial stations including a type A international station.

4.2 International Telecommunications

The state of Zaire's international telephone communications is little better than its domestic system. In the mid-1990s, for example, it had become extremely difficult to reach Kinshasha directly from Europe, sometimes requiring repeated attempts over several days to make a single connection. Officially, this situation is attributed to network congestion, but the actual problem is efficient routing. The only effective route for foreign calls is through an operator in Kinshasha. Even then, however, it is practically impossible for an international caller to reach Bukavu via Kinshasha. One way to contact Bukavu from Paris or Brussels is to

make a connection with a town like Cyangugu, on the border between Zaire and Rwanda, and hope that someone in Cyangugu will relay the message to Bukavu.²

ONPTZ has practically no control over receipts and the big departments of the state, which are the largest consumers of telecommunications, do not pay their bills. This, combined with the free fall of the local currency in the 1990s, meant that Zaire could no longer pay the bills for international communications. This situation reached drastic portions in 1993 when Intelsat threatened to disconnect Zaire because of failure to settle its accounts. In 1994, Zaire paid US \$1.2bn to Intelsat and averted having its international link to the world severed.

4.3 Solar-Powered TSF Stations

A project of the Belgian-Zaire Development Cooperation for the restoration and installation of 86 solar-powered TSF stations was in the execution phase in late 1993. Thirty-six stations were being installed before the breakup of Development Cooperation relationships between the two countries. Fifty other stations were still in the project phase in late 1993. Providing service to rural locations was one of the objectives of these stations.

Solar-powered technology is very adequate in a country like Zaire where distances are great and where intense solar energy exist in abundance. However, the technology is expensive, particularly when photocells are used. In addition, the

infrastructure can be stolen and/or vandalized very easily. An intermediate solution to these issues is to locate the solar-powered communications devices in protected areas and to use technology that is a bit less expensive than photocell- based solar energy.

4.4 Cellular Telephony

The ONPTZ was dealt a hard blow at the end of 1989 when TELECEL, a mobile carrier operating its own telecommunications system, was authorized by the government. TELECEL was launched in Kinshasa, but has plans to extend service to Lubumbashi, Goma, and other locations. TELECEL is linked to the MCI satellite network. The ministries, and the major companies who were clients of the ONPTZ were the first clients to subscribe to TELECEL. In 1992, TELECEL had 4,200 subscribers. While the quality of service improved, only the elite can afford to subscribe to the service. Subsequently, some argued that TELECEL observation is merely another manifestation of the inequity and centralization that has characterized Zaire's society. Further, it is ironic that much of the ONPTZ's low service quality resulted from nonpayment of telephone receipts by the state departments, exactly those who migrated to the new TELECEL -- in 1994, government ministers and officials owned 1,000 TELECEL accounts.³ However, as of 1993, TELECEL maintained a virtual monopoly over telecommunications as

ONPTZ's service was completely unreliable. In May 1995, the cellular operator had an estimated 6,500 subscribers using the service throughout the country.

Originally, TELECEL was allotted both the A and B bands; however, in 1994, there was new entry into the cellular market -- Comcell. Subsequently, TELECEL was ordered to cease transmission over the B band. TELECEL refused to move out of the B band, stating that it would require US\$30 million to restructure its services. In April 1994, armed men raided TELECEL transmitters, cutting cables -- causing the network to go down for 36 hours.

Comcell completed construction of its own earth station and is building its central exchange. In 1994, it had 1000 subscribers and a capacity for 3,000 simultaneous connections. Also, in 1994, Transglobal Telecom was poised to enter the wireless market. Thus, by 1995, we find a scenario, in which the PTT had ground to a halt and private companies are taking advantage of the situation to provide adequate communications to those who can afford this service, i.e., the elite.

The introduction of competition in the Zairian market is expected to result in lower airtime rates in short run. In a country where cellular telephony is used as a substitute to wireline telephony and where airtime rates are as high as \$6 per minute for international calls, competition is bound to have a positive effect on the market. In the future, as cellular phone service continues to spread to the mass

market, other wireless technologies will be increasingly used to provide communication to both the business and consumer markets in major cities like Kinshasa, Lubumbashi, Mbuji Mayi and Matadi. These include mobile satellite technology and wireless local loop technology, all of which need a commitment from the government to allocate spectrum.

A question remains about the type of technology that should be implemented in Zaire in order to address the bottom line: better quality, reliable, low cost, and profitable communications throughout the country. When social and business factors are taken into account, it is clear that there is a need for immediate voice and fax communications, and later data and Internet-type communications. When the geographic and economic factors are taken into account, it becomes evident that the cost and time-effective technology to be used in upgrading and extending Zaire's telecommunications network is wireless communications.

Specific wireless solutions include:

- Cellular and personal communications services (PCS) technologies: these should be implemented in a multiple carrier environment allowing the entire country to be covered and leveraging the entrepreneurial spirit of private parties. The

government could set directions by allocating the frequency spectrum and by suggesting a standard such as Advanced Mobile Phone System (AMPS) which is already used by TELECEL and Comcell. A standard like the Global Standard for Mobile Systems (GSM) should not be disregarded, but some consistency with existing systems is always desirable.

- Wireless local loop technologies: these are at the intersection of wireless and wireline technologies, and could be used to rapidly bolster the existing public telecommunications network. Alternatively, licenses could be given to private organization who would then compete with the PTT. Motorola, among other equipment vendors, has introduced its Wireless Local Loop system (WiLL) in several African countries already. The vendor could push its system through its existing channels in Zaire where it has a long standing presence.

- Satellite technology: already is used in Zaire to a large extent in public telephony and television, the technology could be extended in the form of mobile satellite services provided by private parties. COMSAT is coming up with its Planet 1 system which will offer competitive, ubiquitous communications for about \$3,000 per terminal and \$3 per minute. Iridium, a 66 low Earth Orbit (LEO) satellite system has made agreements with local service providers throughout Africa,

including Zaire.

- Private or Specialized Mobile Radio (PMR or SMR) systems: these trunking systems already widely used in Zaire, could be upgraded with the latest advanced technologies, including digital and encryption.

5.0 Conclusion

In 1994, Zaire's telephone penetration was estimated at .09 del per 100 inhabitants. Further, in 1992, it was estimated that in order to reach the goal of one data exchange line (del) per 100, a total of US\$600 million would have to be invested. Despite the tremendous needs of the telecommunications sector, by 1994, ONPTZ had ground to a halt. In 1992, ONPTZ's had more than 100 employees per 1000 main lines, which was among the highest in the world. As a result, salaries and fringe benefits accounted for 80% of ONPTZ's earnings. Additional expenses including "cream skimming" that occurred with the licensing of the several wireless providers and the shock of a US\$1.2 bn retroactive payment to Intelsat cut into funding that ONPTZ could have used to improve service.

It is imperative to extend the network beyond Kinshasa. Telecommunications must no longer be planned from Kinshasa whose centralized role is in any case slowly wearing away. Compared to Bukavu, Kinshasa is no

longer the geographic nor the economic center of Zaire. In fact, the political configuration that was being put into place in the mid-1990s will give a large degree of autonomy to Zaire's regions thus considerably reducing the level of political-administrative centralization in Kinshasa. In the 1980's, the political system was characterized by a federalist tendency that is hard to envisage given the current decentralizing framework. This framework will impose the need for a semiautonomous network.

The third goal for the sector is to define a more precise administrative framework by separating the postal service and telecommunications. These two sectors face enormous challenges that in many cases can no longer be encompassed by a single ministry or a single national office. Also, the two sectors are managed differently and have different human resources requirements.

The fourth goal of Zaire's future telecommunications policy will be to clarify issues at the organizational level, such as: the sector's operational structures; the responsibilities at different levels as well as the responsibilities assigned to the regions and to Kinshasa; and the delegation of powers.

Zaire's telecommunications accounting and financial system also needs to be revised. The tariff system, the collection methods, and the internal controls structure must be reviewed and adjusted as needed. Furthermore, the billing should be automated, and modern information technology should be employed to

facilitate management of the sector.

Finally, Zaire must develop a campaign for training and informing its population in the use and advantages of telecommunications. In a country where oral communication has historically been so important, the widespread adoption and effective use of the telephone and other telecommunications services would translate into very good business.

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Endnotes

1. Due to numerous factors including the failure of twisted pair wiring and attempts to transition to new technology, the number of lines decreased from 51,000 in 1991 to 34,000 in 1993.
2. Seeking an alternative to such haphazard methods of international communication, the authorities of the Catholic University of Bukavu opted in the 1990s for a private telephone line in Rwanda and a fax – avoiding Zaire's international telephone system altogether.
3. The telecommunications sector, however, was not the only victim of the spirit of privatization that pervaded Zaire's power structure in the late 1980s and early 1990s. The national airline, Air Zaire, was also sacrificed for "Scibe-Zaire," a new airline whose fares were inaccessible to the average citizen and whose planes were said by some to be simply Air Zaire craft with a new coat of paint.