

**Information and Communication Technologies
and Social Development in Senegal:
An Overview**

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Introduction

Given the development of infrastructure and telecommunications services, the proliferation of private radio stations, the diversification of the audiovisual landscape, with packaged satellite programming, connections to the information superhighway, and the growing use of information and communications technologies in different segments of the society, Senegal can be said to have entered the information society in the early 1990s. Since then, it has been faced with an “information revolution,” with its attendant social, as well as political, economic and cultural consequences. Thus, along with technological progress, we are witnessing the foundations for a societal revolution. A careful study of the causes and effects of this phenomenon must be made, in order to ensure that social development continues to be a concern of the highest priority.

Senegal’s entry in the information society is occurring against a particularly difficult economic and social background. The productive structure is dominated by services sector, providing 59.3% of GDP in 1998, while the primary sector, which employs 60% of the population, contributes only 17.4% to the formation of national wealth. Notable as signs of the worsening crisis are the following facts: informal sector workers continue to represent an increasing percentage of the population; the urban unemployment rate is 29%; the annual income of the average Senegalese is US\$530; and 33% of the population lives below the poverty line. Although macroeconomic balances improved following implementation of the 1993 emergency plan and the devaluation of 1994, with a marked growth rate of 6.1% in 1999, Senegal is burdened with a large external debt (US\$3 billion 865 million) and ever greater social deficits.¹

The country’s population, currently 8.6 million, is increasing at the rapid annual rate of 2.7%. The population is composed of a large proportion of young people and women: 58% of the population is under 20 years of age, with women comprising 52% of the total population. Forty-five percent of the population currently lives in the cities, but with the high rate of urbanization, projections suggest that this figure will reach 63% by 2025. There is also a severe imbalance in the spatial distribution of the population, with Dakar (which comprises 0.3% of the national territory) is home to 22% of the population. Rapid demographic growth, the low average age of the population, fast-paced urbanization, and the high proportion of women, create intense social demands that remain largely unsatisfied.² Entire segments of the society are deprived of access to basic services, such as education, health, running water, electricity, etc., against the backdrop of widespread unemployment, with the supply of jobs unable to keep pace with the rising demand for jobs. Thus, in 1998, the rate of school enrollment was 65.1%, with a 65.4% illiteracy rate among adults. Health conditions are a source of concern: the country has high maternal and infant mortality rates; poor health coverage, according to standards recommended by WHO; a 52-year life expectancy at birth; and only 51% of the population with access to drinking water. Though women, who constitute a majority of the population, are heavily involved in agriculture in rural areas and in informal-sector work in urban areas, they are more vulnerable to poverty, disease, and illiteracy than any other group, since the allocation of funding and tools for economic and social development generally benefits others, to the detriment of women. In addition, women have

¹ The figures cited here come primarily from the document “Senegal at a glance,” International Finance Corporation, September 1999, <http://www/ifc/org/sn.htm>.

² Ministry of Economy, Finance and Planning. Planning Office: Programme national de lutte contre la pauvreté: Stratégies et éléments de programme d’actions. Dakar, April 1997, p. 11-20.

virtually no role in policy making, despite the fact that they constitute a majority of the electorate.

Strong demographic pressures and the declining standard of living among broad segments of the population are not without their environmental consequences. In urban areas, problems of household waste management, water pollution from household or industrial waste and environmental sanitation are everyday realities. In rural areas, over-exploitation of natural resources, along with environmental degradation due to climatic and human factors, are causing profound changes in the land – a situation which, in turn, is resulting in significant migration to urban centers.

Since the early 1980s, a variety of factors – a rapidly increasing population; poor economic performance of long standing; a large external debt; stagnation, or even a decline, in investment rates; a low savings rate; and degradation of environmental resources – have left Senegal with a crisis that considerably weakens the State's ability to respond to social demands. One illustration of the level of social problems is the human development index (HDI) established by UNDP, which places Senegal 153rd out of 174 countries for 1998.³

Despite these realities, developments in media and in telecommunications and information technology infrastructure and services have been quite impressive, compared to many African countries. In Senegal, the telecommunications sector, which accounted for 2.6% of gross domestic product (GDP) for 1996, is one of the more highly developed sectors of the economy.⁴ There is, however, a virtual absence of systematic discussion -- either in intellectual and policy circles or among the general public -- concerning the technical, political, economic, cultural and social choices facing the country, or on the forms, rules and values Senegal should adopt, as it comes to play an increasing role in the information society. Indeed, the prevailing attitude appears to be that the introduction and use of information and communications technologies⁵ are natural, intrinsically positive phenomena – a “normal” part of the modernization of society, which therefore calls for no particular thought or debate. In such a context, it is most often technical personnel who make the choices that affect both policy makers and the public at large. The absence of genuine national debate at the time *Sonatel*, the national telecommunications operator, was privatized illustrates the way in which the intellectual and political communities, organized labor, and the public are left on the sidelines in designing and implementing policy regarding information and communications technologies.

The current development of the Internet is taking place under very similar conditions. Without any real strategy, or even an overall policy based on a reasoned choice by the public, the State seems content to repeat, in its official speeches, its goal to make Senegal a “service country,” without giving a rationale or indicating how this is to occur. Further, the political, economic, cultural and social realities of this new society are not being addressed, nor is there discussion of how it will affect the people, in terms of the quality of daily life. There is no more than

³ UNDP: Monitoring human development: Enlarging people's choices... UNDP, Washington, 1999, p. 137.

⁴ International Telecommunications Union: Etude de cas sur l'évolution de l'environnement international des télécommunications: Senegal, ICEA, Paris, February 1998, p. 9.

⁵ Information and communications technologies is used, as in the definition of Cees J. Hamelink, to mean the ensemble of technologies that makes possible the processing of information and facilitates different forms of communication between human beings, between human beings and electronic systems, and between electronic systems, and which have in common the use of digital data (cf. HAMELINK, Cees J.: New information and communication technologies, social development and social change. Discussion paper 86, UNRISD, Geneva, June 1997, p.3.).

cursory debate regarding the protection of privacy and individual freedom, use of cryptography, censorship, the preservation and promotion of cultural patrimony and values, universal access to telecommunications services, the effect on labor conditions and on individual and social relations, the gap between those with access to information and those who lack such access, rural issues, issues regarding the country's diversity of languages, gender and other issues.

The problem is not a lack of thought on these issues, but rather the fact that it is too individualized and too fragmented to provide a basis for a fundamental discussion in the most natural venues – namely, institutions of higher education and research, political parties, labor unions, civil society and the media. It is therefore imperative to mobilize a critical mass among those involved in research programs and institutions, capable of initiating substantive discussion within these arenas and within the society as a whole, to increase the awareness, among as many people as possible, regarding information and communications technologies and the questions they entail. What has, to date, been a monologue on the part of technocrats and specialists must give way to other imperatives – above all, the democratic imperative. Too often, policy making in this area is based on personal preferences, special interests or ideology – a system that must be changed, in order to provide a prior opportunity for serious assessment of possible alternatives and consideration of the implications of policy choices.⁶

Science and technology are tools that serve political, economic and social forces, creating social projects whose consequences for ordinary citizens can be highly positive or disastrous. Indeed, as Manuel Castells has said, while technology does not, in and of itself, determine the direction of history and social change, its presence (or absence) affects the capacity of societies to transform themselves, as well as the uses to which – in a process that inevitably involves conflict – they decide to dedicate their technological potential.⁷ In this respect, the research project launched by UNRISD represents a valuable opportunity for the social sciences research community to create a dynamic atmosphere for multidisciplinary research on the impact of information and communications technologies in our society, promoting options that maximize the potential of the people, rather than isolating them from the process.

⁶ MELODY, William H.: The strategic value of policy research in the information economy, in *Information and Communication Technologies: Visions and Realities*, edited by William H. Dutton, Oxford University Press, 1996, p.304.

⁷ CASTELLS, Manuel: *The rise of the network society*, Vol. 1: *The information age: economy, society and culture*, Oxford, Blackwell Publishers, 1996, p.7.

Issues and methodology

The present study was prepared as a part of the research project on information technology and social development sponsored by the United Nations Research Institute for Social Development (UNRISD), aimed at providing a foundation for future research in this area. Specifically, the study attempts to present, in summary fashion:

- the history of the development of information technologies in Senegal, as well as the contribution of such technology, along with the modernization of telecommunications and of the media, to the formation of the modern Senegal;
- legal and regulatory changes in the information technology sector, as well as an analysis of national information technology policy;
- the development and funding of infrastructure, and related issues;
- information technology and the public sector;
- information technology and the business world, particularly as related to the use of information technology in production, e-commerce and export;
- information technology and democratic reforms, particularly decentralization;
- problems and challenges associated with the use of information technologies in the education and health sectors;
- the experiences of community and private telecenters, and other approaches intended to expand access to means of communication;
- sociological studies regarding the impact of new technologies on family and gender relationships, community power structures, etc.;
- the role of information technologies in the development of economies and societies;
- debate on the information society in Africa generally, and in Senegal, in particular.

In addition to examining the situation in different sectors, this study takes note of earlier studies that have served as a source of information, describing their particular biases or viewpoints. It also points out gaps that exist in the literature, in order to highlight unexplored areas requiring study. The final section addresses a number of problems that could be the focus of future research.

The fact that this work was possible is due primarily to the ability to draw on personal documentation accumulated over the years, as well as on participation in studies, colloquia, seminars, workshops, and personal contacts. It relies on documents that are part of what is known as the “gray” or “underground” literature which, though rarely confidential, are often difficult to access. Senegalese press reports have also been a significant source of information, as well as documents available on the Internet, the work of academics, articles in scientific journals, and other published work.

1. The development of information and communications technologies in Senegal

Information and communications technologies were first introduced in Senegal during the colonial period. More precisely, this began in 1859, with the construction of the first telegraph line between Saint-Louis, which was then the capital, and Gandiole, a major crossroads for trade, located 15 kilometers to the south. In 1862, the Saint-Louis–Gorée line was completed, and Senegal’s telegraph network was linked with France via an underwater ocean cable stretching from Saint-Louis to Spain. As military resistance to colonial conquest was overcome, the network expanded, and was completed in 1900 with the linkage of Sédhiou and

Ziguinchor.⁸ In 1911, a new stage was begun, with the implementation of the French West African radio telegraph network (AOF). Used strictly for administrative and military purposes, this wireless telegraph network was designed for public communication between ships and the coast, and between the telegraph stations distributed along the West African coast. In the first phase, lasting from the second half of the 19th century to the late 1920s, the foundation for a modern telecommunications infrastructure was established. This system was integrally related to the needs associated with colonial domination, namely, the network of administrative and military posts, placed to preserve firm control over the territory and over particular points that played a key role in producing wealth, so as to facilitate the economic exploitation of the country. In 1928, pursuing the implementation of telecommunications infrastructure, the colonial administration created the wireless telegraphy center at Dakar, including the “Dakar Coast” post for communications with ships at sea, and the “Dakar Interior” post for communications with other French West African posts and, via Morocco, with the rest of the world. Several years later, in 1932, the Dakar TSF inter-colonial post was put into service. Designed to improve communications between France and Senegal, this testing station was particularly important for receiving news bulletins from metropolitan France.

Only in 1939, with the establishment of the Radio Dakar station, did radio, as a mass medium, make its appearance in Senegal; at the same time, radio, which was also used to monitor communications for the army, continued to play a military role. Beginning in 1946, five news programs were produced and broadcast from metropolitan France for the French West African colonies, and beginning in 1952, the first locally produced programs began to be broadcast from Saint-Louis. Radio, at the time, played a role somewhat similar to the role of the Internet in today’s world. The overwhelming majority of broadcasts were conceived by the French, and their content, form of broadcast and audience were primarily targeted to the needs of the Europeans, and to what at the time were referred to as the more “developed” segments of the population. Radio was essentially an urban phenomenon, limited almost exclusively to Dakar. Thus, in 1952-53, 27 of the 32 businesses that sold radios were in Dakar, comparable to today’s situation vis-à-vis the Internet, in which 12 out of 13 internet providers are located in Dakar. Between 1960 and 1964, the number of radios grew from 125,000 to 180,000, following the elimination of the radio tax in 1962. An important detail, largely forgotten in the collective memory, is that, beginning in 1962, more than 145 collective listening posts were installed in the seven regions of which the country then consisted. These were supervised by teams of volunteers, including teachers, nurses, rural coordinators, or war veterans, and were regarded as “tools for the stimulation and education of the population.” This system could be considered the predecessor of the community telecenters, interspersed to provide internet access to the less advantaged inhabitants of rural areas or outlying urban areas. There are now two national radio stations – the international station, which broadcasts in the intermediate frequencies, at 1305 kHz, and the domestic station, which broadcasts in the intermediate frequencies, at 765 kHz, and on short-wave at 4890 kHz.

In addition to foreign radio stations broadcasting on short-wave frequencies, such as *Radio France Internationale (RFI)*, the *Voice of America*, *Radio Moscow* and the *BBC*, some Senegalese have had access, since 1970, to *Radio Syd*, a private commercial station broadcasting from Banjul, the Gambia. In December 1990, at the Dakar International Fair (FIDAK), a Senegalese station broadcast for the first time on FM. This station, called *Dakar*

⁸ SY, Jacques Habib: Telecommunications dependency: the African Saga (1850-1980), Alternative Communications Inc., Dakar, 1996, p.74-75.

FM, broadcasts at 94.8 and 96.9 and, in the words of Sophie Ly,⁹ came into being somewhat “by accident.” With continuous musical programming, interspersed with hourly news flashes and advertising, it quickly gained considerable success with listeners and managed to attract unexpected ad revenues, turning a mere experimental into a permanent station. In 1991, *RFI* began broadcasting on FM (at 92 FM), as part of a so-called “bi-cultural” station, with *RTS* providing 6 hours of daily programming and *RFI* broadcasting for the remaining 18 hours. Beginning in December 1992, *Africa No. 1* began broadcasting at 102 FM.¹⁰ Meanwhile, proposals for private broadcasting ventures by Senegalese were blocked, with authorities refusing to approve such proposals on the pretext that there was a lack of available frequencies. In November 1993, the Minister of Communication finally released to the public the list of requirements for future privately-owned radio stations. This included a requirement that broadcasters observe a “one-third/one-third/one-third rule” in order to “guarantee pluralism.” Thus, in regard to political information, broadcasters were required to dedicate one third of the time to the government, one third to the parliamentary majority, and one third to the opposition,¹¹ while the State media were not bound by of any such provision and served as the mouthpiece of the party that was in power. The real purpose of this provision was to reduce, as much as possible, the amount of air time given to opposition parties, attempting thus to limit pluralism on the airwaves.

The country’s first private radio station -- *Sud FM*, part of the press group *Sud Communication*, which publishes the newspaper *Sud Quotidien* -- began broadcasting on July 1, 1994, ushering in the reality of pluralism on the airwaves. Operating with a 250-kilowatt transmitter, broadcasting on 98.5 FM and covering a radius of 100 kilometers, *Sud FM* invested nearly 80 million CFA francs to launch its operation.¹² In 1995, *Sud FM* extended its network by creating *Sen Radio Nord* (Louga, Saint-Louis, Podor, Matam and Linguère), *Sen Radio Centre* (Thiès, Diourbel and Kaolack) and *Sen Radio Sud-Est* (Tamba, Kédougou, Bakel, Ziguinchor and Kolda).¹³ On December 24, 1994, *Dunya FM* began broadcasting on 88.9 FM at 5 kilowatts, covering a radius of 200 kilometers. Six months later, on July 15, 1995, *Nostalgie-Dakar*, a subsidiary of the French station of the same name, began broadcasting on 90.3 FM, covering a radius of 200 kilometers. Then, in December 1997, *Walfadjri FM*, part of the press group that publishes the daily newspaper *Walfadjri*, began broadcasting on 99 FM. The station *7 FM* appeared at the end of December 1998,¹⁴ broadcasting at 97.3 FM, and *Diamono FM*, a station providing economic and social news,¹⁵ joined the roster of private radio stations in October 1999.

Thus, there are now six privately-owned stations. These, however, were created and launched with considerable difficulty, since the allocation of frequencies is made by the board of directors of *RTS*, which has a vested interest in these matters and also acts as a decision-making entity.¹⁶ Worse still, private stations were initially required to pay royalties to *RTS*, thus subsidizing their competitor. The proliferation of private stations has seriously hurt the government station, gaining not only listeners, but advertising revenue at its expense. Furthermore, each new station that is created strengthens the diversity of views expressed on

⁹ Panos Institute; West African Journalists Union: *Le pluralisme radiophonique en Afrique de l’Ouest*. op. cit, p. 119.

¹⁰ *Le Soleil*, January 5, 1993.

¹¹ *Le Soleil*, November 23, 1993.

¹² *Le Soleil*, June 23, 1994.

¹³ Recréer des Sud FM locaux dans les régions. *Radio Actions* No. 6, April 1996, p. 7.

¹⁴ *7 FM* is a part of the group *7 Com*, which publishes the daily *L’Info 7*.

¹⁵ *Sud Quotidien*, September 22, 1999.

¹⁶ *Sonatel* is responsible for technical management of the spectrum.

the air and further weakens the government's grip on the media and, hence, on the minds of the citizenry. The government station is considered by many Senegalese to be "his master's voice" and, according to various polls, is progressively losing listeners.¹⁷

Community radio stations, called "*radios associatives*" in Senegal, find themselves in a difficult situation, since they lack official status. The requirements and agreements applicable to these stations, though created by consensus among officials in the Ministry of Communication and representatives of various NGOs at a workshop held in February 1997, have never been officially approved by the government.¹⁸ Thus, community stations are authorized on a case by case basis. The first to have taken advantage of this "privilege" is *Radio Penc Mi*, a station managed by a federation of three rural organizations in the *arrondissement* of Fissel-Mbadane (near Thiès). Supported by Oxfam/Great Britain, it was approved and received permission to broadcast in November 1995,¹⁹ though the initial proposal was made in 1993.²⁰ For a long time, *Radio Penc Mi* was the only authorized community station in Senegal, since only in 1999 was the National Council for Rural Coordination (CNCR), with support from the *Agence de la Francophonie*, able to establish community stations broadcasting within a 60- to 80-kilometer radius in Joal, Keur Momar Sarr, Koumpentoum, Bakel, and Bignona.²¹ In addition to these rural stations, there are two stations in the Dakar suburbs: *Oxyjeunes*, in Pikine, which is essentially a music station, and *FM Santé*, in Guédiawaye, which specializes in health issues and in medical/social news.²²

In 1996, the World Bank estimated that Senegal had 141 radios per 1000 inhabitants, with 3 million radios projected by 2000.²³ While demographic coverage was 100% in 1998, radio coverage was 90%.²⁴ Technological change, however, is making it possible for stations to increase their coverage dramatically, whether via the Internet or through satellite transmission. In January 1997, *Sud FM* took advantage of the opportunity to be heard throughout the world via internet, and *Nostalgie-Dakar*, *RTS*, and *Walfadjri FM* followed suit in December 1997.²⁵ In this way, Senegalese radio stations target, above all, the "elite" of Senegalese living abroad (students, staff of international organizations, diplomats, expatriate cadres, etc.) generally located in the developed countries (France, United States, etc.). On September 20, 1999, the Worldspace project, which is an effort to broadcast audiovisual programs via satellite in digital format, introduced the satellite option in Dakar. The Worldspace network will be made up of three geo-stationary satellites, the first of which, "AfriStar," was launched on October 28, 1998. With the launching of AsiaStar and AmeriStar in 2000, the system will have coverage of more than 80% of the world's population, and will offer more than 80 radio stations. In Senegal, *Sud FM* is already available on the network, and *7 FM* plans to launch a music-only project.²⁶ Though Africans have the distinction of being

¹⁷ Thus, according to *Walfadjri*, September 21, 1999, *Walf FM* was the station preferred by listeners (41.4%), followed by *Dunya FM* (29.2%), *Sud FM* (14%), *7 FM* (10.4%), *Oxyjeunes*, a community station in Pikine (6.7%), *Nostalgie* (4.7%), the national *RTS* station (3.9%) and *RTS's Dakar FM* (2.4%). Another interesting phenomenon is that since the advent of privately owned FM stations, foreign stations are listened to less, with *RFI* having only 2.2% of listeners, and *Africa No. 1* and *BBC* having 0.1%.

¹⁸ Panos Institute: *Cahier des charges et convention applicables aux radios communautaires au Sénégal*. Panos Institute, Dakar, March 1998, p. 3.

¹⁹ Il ne reste qu'une signature. *Radio Actions* no. 8, August 1996, p. 11.

²⁰ *Gouvernance locale*, No. 6, October 1997, p. 17.

²¹ Radios rurales en série. *Radio Actions* no. 18, October-December 1998, p. 4.

²² *L'Info 7*, September 27, 1999.

²³ World Bank: *World Development Report 1999/2000*, Washington, 1999, p. 266.

²⁴ Current rate of coverage <http://www.primature.sn/rtsp/prog.htm>

²⁵ De l'utilité de s'installer sur Internet. *Radio Actions* no. 15, December 1997, p. 8.

²⁶ *Le Soleil*, September 21, 1999.

the first to use this system, the vast majority of those benefiting from it will certainly not be Africans, given that the price of receivers will be between 175,000 CFA francs and 25,000 CFA francs²⁷ -- ten to fifteen times more expensive than an ordinary radio.

As the radio was slowly becoming a common consumer item, a new technological leap brought national television onto the scene in 1973, following an experimental stage that lasted from 1963 to 1973. *Radiodiffusion Nationale* was renamed the Office of Radio and Television Broadcasting of Senegal (ORTS). Two years after the launch of the television operation, according to UNESCO, there were 35,000 televisions, or 8 televisions per 1,000 inhabitants, while the number of radios rose to 286,000, or 66 per 1000 inhabitants. In considering these figures, however, it should be borne in mind that much of television watching occurred in groups, at the homes of those few fortunate enough to own televisions. More than twenty years later, in 1996, the number of televisions was estimated at 350,000,²⁸ or 41 per 1,000 inhabitants,²⁹ and broadcasting facilities made possible 55% geographic coverage and 70% demographic coverage of the country.³⁰ For a long time, the audiovisual landscape in Senegal consisted of one television channel, a situation that only began to change in the early 1980s. In 1991, in addition to the national channel, an international pay-TV channel, *Canal Horizon*, emerged. The newcomer was a subsidiary of the French-owned *Canal Plus*.³¹ Subsequently, a private Senegalese group, *Excaf Télécom*, began using MMDS³² to broadcast (free of charge, initially) the signals of ten international television channels.³³ As of July 1999, all channels offered by this private promoter, with the exception of *TV5*, *CFI* and *Saudi TV*, have been encrypted, and consumers must buy a decoder and pay a monthly subscription fee to gain access to programming.

The situation with regard to television is clearly echoing the difficulties that private radio stations faced earlier. After one foreign channel was authorized to broadcast, and a private Senegalese group was restricted to transmitting foreign channels, private television promoters had to wait for permission to invest in the audiovisual sector. As before, the real issue concerned protecting the last bastion of resistance to pluralism of information, though the familiar arguments were raised regarding the availability of frequencies and the financial soundness of those seeking authorization. With the advent of independence, radio, and then television -- which had originally been used exclusively as tools to further colonial interests -- became the instrument serving the exclusive interests of the government, under the pretext of promoting development and nation building. With the *Union Progressiste Sénégalaise* (UPS), later known as the Socialist Party (PS), holding control of the government since independence, a shift occurred, whereby radio and television not only became “State media,”³⁴ but also—and more importantly—became government media serving the party in power. Faced with repeated criticism from the opposition, which denounced the State media’s partisanship in dealing with political and social news -- particularly during election periods -- the government decided to create a legal and regulatory framework to guarantee pluralism.

²⁷ *Sud Quotidien*, September 21, 1999.

²⁸ ITU: African telecommunications indicators 1998, p. 102.

²⁹ World Bank: World Development Report 1999/2000, op. cit.

³⁰ Current rate of coverage <http://www.primature.sn/rtts/prog.htm>

³¹ This channel does not broadcast news, but limits itself to sports, film, animation and entertainment.

³² The Multipoint Multichannel Distribution System makes it possible, with cable, to simultaneously carry several television channels on one main wireless carrier.

³³ The proposed channels include *TV5*, *CFI*, *CNN*, *RTP*, *LBC*, *2M*, *Saudi TV*, *MBC*, etc.

³⁴ The official phrase “State media” says more than many speeches on the role and conception of news prevalent among these press organizations.

It was against this background that the Senior Council of Radio and Television (HCRT) was created, through Decree 91-537 of May 25, 1991, which dealt with respect for pluralism on the part of public radio and television. With the official objective of “strengthening the democratization of audiovisual media and ensuring that the basic rules concerning pluralism in broadcast media henceforth enjoy a legislative guarantee, rather than depending on the provisions of a mere decree,”³⁵ Law 92-57 was passed on September 3, 1992, to provide a legislative basis for the existence of the HCRT. This entity was comprised of nine members, of whom eight were chosen by the President of the Republic and one was appointed by the President of the National Assembly, with all serving three-year terms renewable for a single term. The organization’s mission was to guarantee access by political parties to public radio and television, as well as to monitor compliance with the rules on pluralism in news coverage.³⁶ Some years later, however, the HCRT was eliminated and replaced by the Senior Audiovisual Council (HCA), extending the authority of this administrative entity to cover all audiovisual media, regardless of their legal status.³⁷ The nine members of the HCA are appointed under the same terms as the members of its predecessor, but the term of office was changed to six years, and is not renewable.³⁸ While the HCRT, and then the HCA have theoretically been responsible for guaranteeing pluralism of information and ensuring opposition party access to public audiovisual media, they have, in fact, been characterized by partisanship favoring the party in power, sending repeated warnings to private media organizations suspected of being overly favorable to the opposition, as well as to opposition parties accused of criticizing the regime in what are deemed to be “improper” ways. Meanwhile, the public media continue, with complete impunity, to exclude parties, unions, NGOs, and persons from civil society who, in one way or another, oppose the party in power. On the institutional front, the ORTS was dissolved in December 1991, and became the national company *Radiodiffusion Télévision Sénégalaise (RTS)*.³⁹ This new status, far from reflecting a government intention to end its tight control over television, was simply the result of a policy of financial disengagement. *RTS* was given management autonomy and the legal authority to conduct all types of commercial, industrial, real estate and financial operations needed to carry out its mission,⁴⁰ and was required to keep pace with private management, while being subject to high-level oversight by government officials. It should also be noted that both radio and television long suffered from the failure to provide complete coverage of the national territory, under a system known as “deficient coverage.” This meant that there were so-called “land-locked” or “peripheral” areas—in reality, the majority of the country, geographically speaking—where coverage was slight, bad, or simply non-existent, thus excluding a large segment of the population from access to national and international news.⁴¹ However, since the advent of the Communication Satellite (COMSAT) project, which required an investment of 13 billion CFA francs, this situation is but an unpleasant memory.⁴² Thus, *RTS* ensured television and (FM) radio coverage of the entire country, thanks to a set of

³⁵ Explanatory memorandum to Law 92-57, September 3, 1992.

³⁶ Art. 3 of Law 92-57, September 3, 1992.

³⁷ Explanatory memorandum to Law 98-02 of March 1998.

³⁸ Art. 11 of Law 98-02, March 1998.

³⁹ Law 92-02, December 16, 1991.

⁴⁰ Panos Institute; West African Journalists Union: *Le pluralisme radiophonique en Afrique de l’Ouest*. vol. 1, L’Harmattan, Paris, 1993, p. 113.

⁴¹ The account of the introduction of radio, and later television, in Senegal, is based primarily on the thesis of Saidou Dia: *De la TSF coloniale à l’ORTS: Evolution de la place et du rôle de la radiodiffusion au Sénégal (1911-1986)*, graduate thesis, Université de Bordeaux III, 1987, 2 volumes, 660 pp.

⁴² *RTS* assumed responsibility for it. The cost of renting the satellite is approximately 200 million CFA francs per year.

ground-based relays⁴³ allowing listeners to receive *RTS* broadcasts (television and radio) without satellite dishes. It is expected that future satellite coverage will include Africa, Europe (as far as Russia) and the Mideast (as far as Jedda).⁴⁴

Along with the implementation of a telecommunications network (to be considered further, below) and then, of a radio and television broadcast infrastructure, the process of introducing information and communications technologies within the different sectors of Senegalese society took on another dimension in the 1960s, with the use of initial computer applications at the Ministry of Economy and Finance. A decade later, in 1972, in response to the importance of computer technology, the government created the National Information Technology Committee (CNI),⁴⁵ reporting to the President of the Republic. The CNI has been responsible for formulating and coordinating national information technology policy.⁴⁶ Prior to 1983, there were fewer than 100 computers in the country, but from 1984 to 1998, this number grew rapidly, particularly in 1989, when 900 computers were sold. According to estimates from a 1996 study, there were 1000 minicomputers and large systems, and 50,000 microcomputers, with an increase of approximately 2,500 units per year,⁴⁷ while the World Bank estimated that there were 11.4 computers per 1,000 inhabitants in 1997.⁴⁸ Since 1996, however, the annual growth has been between 15% and 20%, with 10,000 to 12,000 computers sold each year.⁴⁹ A total of 21 billion CFA francs was spent on computer equipment in 1998. Most of the large computer manufacturers (IBM, Compaq, Bull, Apple, etc.) have a presence in Senegal, and there is a dense network of distributors and of companies providing computer engineering and services.⁵⁰

In 1988, *Sonatel* put a X25 data packet transmission network into operation under the name *Senpac*. It provides access to data banks and connections to foreign networks at 19,200 bps. It targets businesses and, to a lesser extent, institutions of higher education and research. Though its speed has been increased, since 1997, to 64,000 bps for both national and international connections, it will never have more than 1,000 subscribers, and will remain part of a fairly limited market, having been unable to offer low-cost service tailored to the general public.

As is true in other parts of the world, the Internet will play the most important role in pushing information and communications technology to the forefront. The Internet first reached Senegal in the late 1980s, when a node of the RIO network,⁵¹ owned by ORSTOM,⁵² was implemented using the UUCP protocol, followed by a *Fidonet/Greenet* node at the headquarters of the NGO, Enda Tiers-Monde. At that time, the Internet was the concern of no more than a few dozen people. E-mail and file transfer were the main services carried out using, respectively, *Senpac*'s

⁴³ These land-based relay stations were installed in Tambacounda, Kédougou, Ziguinchor, Kaolack, Bakel, Kolda, Thiès, Louga, Podor, Matam, Linguère, Vélingara, Richard-Toll, Goudiry, Koumpentoum, Saint-Louis, Dakar and Rufisque.

⁴⁴ *Le Soleil*, September 27, 1999.

⁴⁵ Decision No. 8543/PM /SGG, August 2, 1972.

⁴⁶ Commission for Informatics Development. Ministry of Science and Technology Research: Plan d'actions suite aux directives relatives à l'informatique et aux nouvelles technologies de l'information et de la communication, Dakar, 1997, p. 3.

⁴⁷ Internet documents: Afrique de l'Ouest. Paris, Aupelf-Uref, 1996.

⁴⁸ World Bank: World Development Report 1999/2000, op. cit.

⁴⁹ Office of External Economic Relations: Le secteur informatique au Sénégal. Dakar, June 1999, p. 4.

⁵⁰ *Technopolis*, No. 2, April 1998, p. 13.

⁵¹ Intertropical computer network.

⁵² ORSTOM was subsequently named the Institut de Recherche pour le Développement, or IRD [Institute of Research for Development].

lines⁵³ and Senegal's telephone lines. There was no national domain name scheme, and service providers generally used electronic addresses ending in ".ca," ".fr," and ".org." In 1992, however, in collaboration with ORSTOM, the computer engineering department of ENSUT⁵⁴ became the manager of the ".sn" domain under the purview of internet authorities, whereupon the first ".sn" addresses began to appear. In late 1993, this became a regional focal point for West Africa, with the launching of the RINAF project (Regional Informatics Network for Africa) in Dakar in February 1992, under the auspices of UNESCO. The project provided e-mail at the National Center for Scientific and Technical Documentation (CNDST) and, later, at the computer laboratory of the *Ecole Normale Supérieure*, the Office of Forecasting and Statistics, the Commission of Scientific and Technical Affairs, the library of the Université Cheikh Anta Diop de Dakar, and the library of the Université Gaston Berger de Saint-Louis. In October 1994, users of the SYFED Center⁵⁵ in Dakar and of SYFED outposts run by AUPELF-UREF gained access to e-mail – provided, in this case, by Minitel. Despite these advances, however, there are still no internet providers registered and authorized to market internet access, and only certain NGOs, administrative services, and institutions of higher education and research have internet access. In the absence of an internet protocol (IP) governing Senegal's connection to the Internet, the prevailing technique was to bundle IP packets within X25 networks, which allowed AUPELF-UREF, in November 1995, to make available a ground-breaking internet connection.

In the mid-1990s, when the Internet was beginning to be deployed in Africa, controversy erupted between those who stressed its potential negative consequences, and those who argued that it would provide important opportunities. In *Internet Nord-Sud*, created by *Le Monde Diplomatique* in February 1996,⁵⁶ as well as in various meetings, those who cast a critical eye on the Internet emphasized, among other concerns, the following particular points:

- the Internet symbolizes the political, economic, and cultural hegemony of the United States;
- it serves large financial and commercial monopolies;
- there is a risk that it will isolate the Internet-connected elite from the rest of the population;
- the information it provides is primarily in English;
- it represents a danger to African cultures;
- it is based on telecommunications infrastructure that reproduces North-South inequalities;

Those on the other side of the controversy emphasized positive factors, such as:

- increased possibilities for communications;
- low communications costs;
- the possibility of disseminating African cultures and points of view;
- the need to connect Africa to avoid further marginalization.

Two sometimes contradictory factors -- the urgency of finding lasting solutions to problems of education, health, and food self-sufficiency for the majority of the population; and the understandable desire to be a part of global advances by investing in technologies that may be seen a useless, or even indecent luxury – would appear to leave the African countries with a

⁵³ *Senpac* is the country's X25 data packet transmission network.

⁵⁴ *Ecole nationale supérieure universitaire de technologie*, subsequently *Ecole supérieure polytechnique* (Esp).

⁵⁵ The Syfed-Refer center on the campus of the Université Cheikh Anta Diop de Dakar is a document centre that is the focal point of the Syfed network (Système Francophone d'Édition et de Diffusion), created by the Agence francophone pour l'enseignement supérieur et la recherche (Aupelf). With the advent of the internet, the Syfed network was completed by the Réseau Electronique Francophone de l'Enseignement et de la Recherche (Refer).

⁵⁶ The complete archives can be consulted at: <http://www.ina.fr/CP/MondeDiplo/Forum>.

dilemma. Nevertheless, in weighing the pros and cons, there are those who believe that Africa should be connected and incorporate this technology in order to overcome the existing gap between the information-poor and the information-rich.⁵⁷ While acknowledging that connecting to the information superhighway carries a risk of increasing the inequalities between rich and poor countries and, within countries, between rich and poor, it is believed that neglecting to do so would constitute a further obstacle to economic progress and social development.⁵⁸ Attention is being drawn to the fact that if this connection is to be made, it is important that Africa, and the southern countries in general, must become producers of information services and products, rather than be relegated to the status of consumer – a far less enviable and profitable role.⁵⁹ In addition to the area of information technology itself, there is emphasis on the need to develop applications that contribute to improving health, education, training, culture, etc., so that Africa can be an active “driver” on the information highway, rather than a mere hitchhiker.⁶⁰

In March 1996, following the signing of an agreement between *Sonatel* and the American company, MCI, Senegal officially connected to the Internet via a 64 Kbps link, and in April, *Télécom-Plus* began to market internet access. In May 1997, Senegal tripled its bandwidth, with the inauguration of two new 64-Kbps lines to Canada, underwritten by a partnership between *Sonatel* and *Télé globe*. The Canadian connection was increased to 1 Mbps in November 1997, and to 2 Mbps in September 1999, offering better conditions for users.⁶¹

Sonatel, several private companies and NGOs, and public entities now sell internet access. Technically, it is possible to connect permanently by dedicated lines, either intermittently through the national telephone network, through the integrated digital services network (ISDN), or through the *Senpac X25* connection. *Sonatel* has decided to limit itself to the role of operator for internet access, leaving its subsidiary *Télécom-Plus* to sell internet access, but it has reserved its monopoly on selling dedicated lines. For a long time, only 64-Kbps dedicated lines were available, but 128-Kbps and 256-Kbps connections were established in February 1999. The cost was high, but fell 40% on March 1, 2000,⁶² after repeated complaints by internet access providers, telecommunications service providers, computer professionals, and users' groups. In addition to these dedicated lines, *Sonatel* offers ISDN and X25 connections. ISDN connections offer a completely digital network billed according to the amount of time spent on line.⁶³ It allows data transmission at a minimum speed of 64 Kbps, making it highly attractive for multimedia applications, since these speeds are much higher than those of the switched telephone network.⁶⁴ Local telephone network access is provided by a dozen ISPs, of which six are private-sector companies (*Télécom-Plus*, *Métissacana*, *Arc Informatique*, *Cyber Business Center*, *Point Net*, and *WAIT*), four are public or semi-public (Office of the Prime Minister, Université Cheikh Anta Diop de Dakar, Université Gaston Berger de Saint-Louis, and *Trade Point Senegal*), while one is from the associative sector (*Enda Tiers-Monde*) and one is an

⁵⁷ SAGNA, Olivier: *Les réseaux TCP/IP en Afrique: Intérêt, enjeux et espoirs*, in *Quarterly Bulletin of the International Association of Agricultural Information Specialists*, 1996, Vol. 41, No. 2, p. 170.

⁵⁸ SAGNA, Olivier: *Le rôle des inforoutes dans le rééquilibrage des échanges d'informations Nord-Sud*, in *Argus*, Spring-Summer 1997, Volume 26, No. 1, p. 8.

⁵⁹ Ibid. p.6.

⁶⁰ SAGNA, Olivier; DENIS, Jean-Pierre: *L'Afrique, les inforoutes et la francophonie*, in *Documentaliste-Sciences de l'information*, May-June 1996, Vol. 33, No. 3, p. 147.

⁶¹ What is involved is the installation of a 2-Mbps link with France.

⁶² Monthly rates for these connections, which were 996,000 CFA francs, 1,550,000 CFA francs and 2,765,000 CFA francs thus became 600,000 CFA francs, 996,000 CFA francs and 1,659,000 CFA francs (Cf. *Le Soleil*, February 10, 2000).

⁶³ Installation of an ISDN connection costs 150,000 CFA francs, plus a bimonthly fee of 40,000 CFA francs, and communications costs at 50 CFA francs per two minutes.

⁶⁴ Generally speaking, it is rare to work at speeds above 28.8 Kbps, even with a 56-Kbps modem.

international organization (AUPELF-UREF). Prices for unlimited connections range from 9,600 CFA francs to 15,000 CFA francs per month, while the price of connection via telephone lines is based on a single rate of 50 CFA francs per two minutes, regardless of the specific place in the country from which the connection is initiated.⁶⁵ While Senegal's rates (monthly fees plus telephone charges) are, along with South Africa, among the cheapest in Africa,⁶⁶ they are still high for Senegalese users, representing 17.6% of per-capita GDP,⁶⁷ as compared with 1.2% in the United States.⁶⁸ Furthermore, the competition among internet access providers takes place on an unequal playing field, since *Télécom-Plus*, a subsidiary of *Sonatel* and *France Câble et Radio (FCR)*, created in 1991, not only benefit from *Sonatel*'s personnel, technical expertise, and infrastructure, but also have a direct internet connection, because of *Sonatel*'s internet presence. This gives *Télécom-Plus* users clearly superior connections to those provided by other companies, which are forced to use the dedicated lines provided by *Sonatel*. An August 1997 survey of ISPs indicated that none of the companies in this sector had begun to show a profit and they were only able to survive as a result of other activities in which they were involved.⁶⁹ Although there have been some problems – primarily regarding the *Sonatel* monopoly – the Internet has developed at a fairly rapid pace. In January 2000, the Internet Software Consortium estimated that there were 306 servers connected to the Internet,⁷⁰ while the number of users was close to 11,000.⁷¹

The relatively rapid development of information and communications technologies described below is largely the result of the quality and quantity of human resources available. According to the World Bank, Senegal had 342 computer engineers and 467 advanced technical personnel per million inhabitants in the mid 1990s.⁷² The training of these human resources is largely carried out at the local level – at universities, and public and private institutions of higher education. Existing training facilities include:

- the computer engineering department of the *Ecole Supérieure Polytechnique (Esp)* of the Université Cheikh Anta Diop de Dakar for the training of computer technicians and engineers;
- the School of Science and Technical Studies of the Université Cheikh Anta Diop de Dakar, and the applied mathematics and computer science training and research division at the Université Gaston Berger de Saint-Louis, which grants the following degrees in computer science: a Diploma of General University Studies (DEUG), a *Licence* (given after three years of post-Baccalaureate study), a Masters, and a Diploma of Advanced Studies (DEA);
- the Center for Information Science and Technology Research at the Université Cheikh Anta Diop de Dakar, and the Institut Supérieur des Sciences de l'Information et de la Communication (ISSIC) for professionals in the field of social communication;

⁶⁵ So as to make connection possible, without having to go through Dakar, *Sonatel* plans to place secondary nodes in the country's principal regions.

⁶⁶ COCHRANE, Jeffrey A.; BUNNER Jake: Africa and the Internet Superhighway Checkpoints, p. 380, in VEIT Peter: Africa's valuable assets: a reader in natural resources management, World Resource Institute, 1998.

⁶⁷ According to World Bank figures, per capita GDP was US\$550 in 1997.

⁶⁸ International Telecommunications Union: Challenges to the Network, Internet for Development, Executive summary, Geneva, February 1999, p. 6.

⁶⁹ WILSON III, Ernest J.: Wiring the African Economy, CIDCM Working Research Paper Series, Telematics for Development Program, University of Maryland, College Park, August 1998, p. 9.

⁷⁰ Internet Software Consortium: <http://www.isc.org>

⁷¹ Figure provided in April 2000 by a *Sonatel* official, following a study by the company.

⁷² *Technopolis*, op. cit.

- The School for Archive and Documentation Librarians (EBAD), at the Université Cheikh Anta Diop de Dakar, for information technology professionals;
- the *Ecole Supérieure Multinationale des Télécommunications* (ESMT) for telecommunications technicians and engineers.

The importance assumed by information and communications technologies has also given rise to commercial and scientific enterprises, such as the Salon international de l'informatique, de l'électronique et de la communication (SINEC), held, for the fourth time, in June 1999, at the site of the Dakar International Fair (FIDAK), and the African biennial conference on science and technology, AFRISTEC, which brought together scientists from throughout Africa and was held, for the third time, from November 22 to 26, 1999.

2. National policy

The telecommunications infrastructure in 1985 was of poor quality. With 23,000 main telephone lines, the density of telephone lines was 0.5 per 100 inhabitants; the network was entirely analog, inefficient, and often out of service, while the sector's sales revenue was 16.5 billion CFA francs. It was at that point that the government, in the context of the first telecommunications reform, decided to devote priority attention to developing the sector. One result of this effort was the creation of the Directorate of Posts and Telecommunications (OPT), as well as the formation of two separate companies, the *Office des Postes et de la Caisse d'Epargne*, (OPCE), and the *Société Nationale des Télécommunications* (Sonatel), which from that point onward consolidated various telecommunications ventures, including the international communications activities previously managed by *TéléSénégal* and implementing of an emergency plan to restructure the national telecommunications network.⁷³ In the late 1980s, government officials also began to recognize the importance that information and communications technologies would inevitably play in economic and social development. Thus, in 1989, the authors of the report, "Prospective Study: Senegal 2015" noted, under the category of "trends that have affected and will affect Senegal," that "the coming of a communications society, based on the development of information technologies and creating even greater global interdependence, will influence life styles and modes of production."⁷⁴ They also write, in addressing "probable and possible changes," that "the progress of information technologies will most likely promote the dissemination of Western cultural models and values, and will thus hasten the decline of traditional values, primarily in urban settings and among young people (i.e., in the dominant urban culture)." They go on to warn, "But the risk is great that these technologies will benefit only a privileged minority (with access and skills), accentuating inequalities in a dual, splintered society with a privileged minority, while the masses are excluded from growth."⁷⁵ Though it is clear from this that Senegalese officials are aware of the risk of marginalizing the disadvantaged, it remains unclear how this central issue will be addressed: the authors are content to propose, as a remedy, in a section entitled "Outline of strategies for escaping the trend," a strategic objective consisting simply of "strengthening and facilitating access to information, and promoting social communication."⁷⁶

⁷³ Government of Senegal: Déclaration de politique de développement des télécommunications sénégalaises (1996-2000), Dakar, March 1996, p. 1.

⁷⁴ Ministry of Planning and Cooperation: Etude prospective "Sénégal 2015," Dakar, June 1989, p. 34

⁷⁵ Ibid. p. 37.

⁷⁶ Ibid. p. 105.

With the “second telecommunications reform,” in 1996, the government presented a “Policy Statement on the Development of Senegalese Telecommunications (1996-2000),” setting, as objectives for the year 2000:

- to raise the telecommunications sector share of GDP from 2.4% to 3.5%;
- to triple the availability of telephone service, increasing the number of lines to 250,000, thus attaining a density of 2.5 telephone lines per 100 inhabitants;
- to equip more than 50% of small local centers with at least one telephone line each, while providing that everyone in the country will be within 5 kilometers of a telephone; and
- to promote the development of a local telecommunications equipment industry.⁷⁷

In 1997, with publication of the Ninth Economic and Social Development Plan (1996-2001), a strategy aimed at “strengthening and facilitating access to information” was proposed. Stating that “information and communications technologies are no longer considered a luxury for the elite, but rather an absolute necessity for development,”⁷⁸ and with a view to making Senegal a services economy, the following major recommendations were made:

- “ensure a continuous flow of information and communication, by supporting initiatives designed to improve resources and other related initiatives, as well as initiatives to increase knowledge that could be used for creating new information networks, with high value added, in different sectors of the society, such as education, health, employment, culture, the environment, trade, finance, tourism, commerce;
- “to strengthen the nation’s information and communications network, making communications reliable, and available at reasonable cost, using domestic and international providers;
- “to take optimal advantage of information, encouraging the implementation of systems that reach a broad range of individuals, businesses, NGOs, and the public sector. This objective could be furthered by creating an autonomous institution dealing in statistics;
- “to improve coordination between businesses and private individuals, and foster mutually beneficial relationships, through establishing connections that promote information exchange among various segments of society;
- “to provide access to information resources for every student, village, government body and business;
- “to promote new generations of Senegalese capable of using information and communications technologies, and speed development by improving educational systems and enhancing human resources needed to implement, maintain, and exploit state-of-the-art information and communications technologies;
- “to link Senegal with the rest of the world by permitting the entry of new technologies and exporting intellectual products and services;
- “to create an environment that encourages the development of information and communications technologies by providing incentives to the private sector to assume a dominant role in the provision of services;
- “to encourage the use of information and communications technologies in government, and to create national data bases in the key sectors of economy and public administration;
- “to adopt expeditious measures to promote the creation of affordable local internet services that are widely available and provide local news;

⁷⁷ Government of Senegal: Déclaration de politique de développement des télécommunications sénégalaises (1996-2000), Dakar, March 1996, p. 3.

⁷⁸ Ministry of Economy, Finance and Planning. Planning Office: Plan pour le développement économique et social 1996-2001 (IX^e Plan) compétitivité et développement humain durable. Dakar, February 1997, p. 130.

- “to eliminate or reduce tariffs and import duties for information and communications technologies.”⁷⁹

While these measures are clearly intended to expand and facilitate access to information, there are no concrete proposals to guard against the risk of marginalizing the most disadvantaged segments of the population, which, by the end of the 1980s, had been identified. Rather than taking account of citizens and their rights, the scenario instead focuses on individuals and their purchasing power. The question of how to utilize information and communications technology in government is being addressed, but the issue of service to the public, and the rights and benefits that citizens—particularly, the poor—derive from such service is not being factored into the equation.

Beyond its general vision for the future, the government, faced with this reality, has no real strategy for introducing and utilizing information and communications technologies in a way that overcomes Senegal’s economic and social development problems. Thus, the document produced by the Ministry of Communication in 1997, entitled “Senegal’s strategy for dealing with the information superhighway”⁸⁰ is more a survey of conceptual approaches and current initiatives than an actual strategy document. The Ministry of Science and Technology Research implicitly acknowledged this weakness in an April 1998 document that addressed the question of how to increase the capacity of the people to utilize information and communications technologies. This document stressed the need to create or strengthen existing institutional mechanisms capable of taking appropriate action “in the context of a comprehensive, coherent, and well-defined policy implemented by an entity with a mission and with the authority and prerogatives to bring about improvements in information and communications technologies.”⁸¹

The principal problem is that the centers of decision-making are numerous and unstable. This multiplicity is due primarily to the fact that a number of different entities are responsible for dealing with the information and communications technology sector. These include:

- the National Telecommunications Coordinating Committee, which was created in 1960 and reports to the President of the Republic;
- the National Information Technology Commission, created in 1972, which also reports to the President;⁸²
- the Commission for Informatics Development, created in 1987;⁸³
- the Ministry of Communication, which regulates the telecommunications sector through the Directorate of Postal and Telecommunications Management and Research, created in 1994;⁸⁴

⁷⁹ Ministry of Economy, Finance and Planning. Planning Office: Plan pour le développement économique et social 1996-2001 (IX^e plan) compétitivité et développement humain durable. op. cit. p.130-131.

⁸⁰ Ministry of Communications: La stratégie du Sénégal face aux autoroutes de l’information, Dakar, 1997, 16 pp.

⁸¹ Commission for Informatics Development. Ministry of Science and Technology Research: Journées nationales de réflexion sur la recherche scientifique pour le développement. Thème: Renforcement des capacités nationales en matière d’utilisation des nouvelles technologies de l’information et de la communication (TIC) et de valorisation de l’information scientifique et technique au service du développement, Dakar, April 1998, p. 27.

⁸² Decision No. 8543/PM /SGG, August 2, 1972.

⁸³ Decree No. 87-1402, November 17, 1987.

⁸⁴ Decree 94-896/MICOM/SAGE, September 5, 1994.

- the Ministry of Energy, Mines, and Industry, which oversees the Senior Council for Industries (created in 1998), whose major responsibility is to define strategy for telecommunications clusters;
- the Ministry of Commerce and Small-Scale Industries, which oversees *Trade Point Senegal*.

The instability referred to above is due to the fact that entities such as the Commission for Informatics Development (DINFO) have been moved a number of times from one part of the government hierarchy to another. Initially reporting to the President, DINFO subsequently became a deputy ministry, then a division of the Ministry of Modernization and Technology, and finally, in July 1998, a part of the Ministry of Science and Technology Research.⁸⁵ Added to this situation is the fact that the national “information superhighway” policy, which is central to policy regarding the use of information and communications technologies, has been defined and coordinated at times by DINFO, at other times by the Ministry of Communication, and most recently by the Senior Council for Industries. Besides their involvement in official decision-making, these different entities have been engaged in ongoing, behind-the-scenes struggles for position, with each attempting to use its legal and regulatory authority to determine government policy. This battle for “legitimacy” has been an obstacle to establishing the broad, coherent national policy referred to above.

Having become aware of this problem, Mamadou Lamine Loum, who became Prime Minister in July 1998, gave DINFO the task of “creating a coherent framework for promoting new information and communications technologies over the next two years.”⁸⁶ In the context of a policy to encourage the development of information and communications technologies on a “voluntary” basis, three tasks were specified:

- to establish, within political circles, recognition of the vital importance that information and communications technologies will have for the country’s economy at the advent of the 21st century;
- to remedy the problems that currently prevent enterprises from having a real effect on training;
- to help provide private enterprise with an economic environment conducive to its development.

Though the plan of action proposed by DINFO has the virtue of being systematic, neither its general principles, its policy approach, nor its implementation mechanisms deal with the government’s role in reducing the gap between the information-rich and the information-poor. It does, however, stress the importance of taking the following important actions:

- providing for equality, throughout the different parts of the country, in promoting and developing information and communications technology;
- taking specific action to encourage the use and incorporation of these technologies by women and young people;
- assigning a central role to initial and ongoing training in information and communications technologies, and reviewing and revising teaching curricula;

⁸⁵ In the new government, formed on April 3, 2000, DINFO again was placed under the authority of the President.

⁸⁶ Commission for Informatics Development. Ministry of Science and Technology Research: Plan d’actions suite aux directives relatives à l’informatique et aux nouvelles technologies de l’information et de la communication, Dakar, 1998, p. 1.

- implementing services that provide citizens easy access to information they require and streamlining administrative procedures;⁸⁷

Nowhere, however, does this scheme provide for the use of specific mechanisms or assessment of the proposed measures, nor does it provide any information regarding budgeting to facilitate the financing of these actions.

On July 15, 1999, an interministerial meeting on telecommunications services was held, with a view to preparing the country to play an active role in the information society and making Senegal an emerging player in telecommunications services. Among the priorities for developing telecommunications services, the Ministry of Energy, Mines, and Industry, which acted as the coordinator of the interministerial council, cited improving relations between the government and citizens, creating jobs, improving social communication, providing access to knowledge for all citizens, and making available the opportunities offered by e-commerce. To date, no concrete decision has yet been made. Except for the objective of creating a national training strategy for computer work and information and communications, the implementation of the measures is being held up. The main elements of these measures are: to conduct studies to provide a framework for telecommunications services; to implement an appropriate rate system that will promote usage; to create a service industry and environment that encourage projects with high value added; to make adjustments to the ordinary law tax system and to taxes on electronic commerce; to give further study to the problems involved in ISO certification; and to address the question of service incubators and business incubators.⁸⁸

The government's scheme also includes the Dakar Technopole, created in December 1996. This is a 194.5-hectare economic zone, whose mission is to host research and teaching centers and enterprises involved in technological innovation, in order to:

- reduce the cost of obtaining management, technical, tax, and financial advantages for on-site high-technology enterprises;
- eliminate obstacles to creating networks carrying out innovative work; and
- encourage the development of work involving high value-added technology transfer.⁸⁹

The Dakar Technopole is the first complex of its type in Africa and it is hoped that it will serve as an interface between research and industry. It encompasses four technology complexes: agriculture/food, management and coordination, information and telecommunications technology, and environment, energy, and medicinal plants. The Technopole is run by a corporation with minority shares held by the public sector; its objective is to improve the publication and dissemination of scientific research results through technology transfer and strengthen training in the various economic sectors.⁹⁰ Within the Technopole, *Sonatel* intends to create a "Telepole." The overall objective is to provide information and training on new technologies to operators, in order to provide enterprises located at the site the latest telecommunications products and services, in order to make them

⁸⁷ Ibid. p. 8

⁸⁸ Office of the Prime Minister. Republic of Senegal: Compte rendu de la réunion du conseil inter-ministériel consacré aux téléservices, Dakar, July 16, 1999, 4 pp.

⁸⁹ Explanatory memorandum to Law No. 96-36, December 31, 1996, regarding the creation and bylaws of the Technopole de Dakar.

⁹⁰ Cf. <http://www.primature.sn/investir/centre.htm#TECHNOPOLE>

more competitive.⁹¹ To date, only *Téléservices SA*, a subsidiary of *Sonatel*, has joined Technopole.⁹²

3. Development of infrastructure and services

In the wake of the emergency plan implemented by the government in 1985, and sectoral reform that began in 1996, Senegal's telecommunications infrastructure can be described as follows:

- All switching in the public network is digital.
- The country's 30 departments are connected with the network via digital connections, making the transmission network entirely digital.
- Twenty-two of the 30 departments are connected to the network through fiber optic connections.
- All principal towns in rural communities have telephone access.
- The packet-switched data transmission network (*Senpac*) began operation in 1988, and provides businesses with access to data banks as well as connections to foreign networks, at speeds of up to 19,200 bps, though speed on national and international sections has been 64 Kbps since 1997.
- The "Videotel" or Videotex kiosk has been in operation since 1994, while MinitelNet, which provides connections with Minitel services abroad, has been in service since 1995.
- The "Infotel" or voice kiosk has been on the market since 1995.
- Twenty-four of the 30 departments have access to the integrated digital services network (IDSN), and international IDSN has been available since the first quarter of 1997.
- Synchronous digital hierarchy (SDH) was introduced in 1997;
- Implementation of the intelligent network, in 1998, makes possible network services – such as credit card tax payments, virtual private networks, free calling, number for shared taxation, telephone booths – and the universal number and universal personal telecommunications have increased possibilities for providing value-added services.
- Dedicated international digital satellite connections at 64 Kbps are possible.
- X400 messaging service is available.

⁹¹ Recherche et entreprises: un "Télépôle" pour créer une synergie, *Le Soleil*, Multimedia column, October 3, 1998.

⁹² FIAS: Sénégal: Le parcours de l'investisseur. Foreign Investment Advisory Service, Washington DC, March 1999, 94 pp. + annexes.

- The underwater fiber optic cable project known as Atlantis II, connecting Europe, Senegal and South America should be in service by the year 2000, at the latest.⁹³
- The digital cellular network, *Alizé*, which is a GSM system created by *Sonatel*, covers the country's main cities and principal roads⁹⁴ and is connected with foreign networks (in Great Britain, Spain, Italy, etc.) A second private operator, *Sentel*⁹⁵, which is a subsidiary of Millicom International Cellular (MIC), has a renewable license valid for 20 years, and began operations on April 7, 1999, with a network that currently covers the Dakar-Thiès-Mbour axis, representing, according to *Sentel*'s general manager, 85% of the cellular market in Senegal.⁹⁶ As elsewhere in Africa,⁹⁷ the development of mobile telephony is dramatic. Initiated in 1994 by *Sonatel*, cellular telephone service had 98 subscribers in 1994, 122 in 1995, and 1,492 in 1996, jumping to 6,942 in December 1997,⁹⁸ 73,000 in January 2000⁹⁹ and 100,000 in May 2000. *Sentel* passed the 10,000-subscribers landmark in November 1999, ending the year with 14,500¹⁰⁰ and reaching 25,000 by April 2000.¹⁰¹ In all, mobile telephony represents close to 125,000 lines, while 1998 forecasts by the International Telecommunications Union estimated that there would be 30,000 subscribers in the year 2000.¹⁰²
- SITA (Airlines Worldwide Telecommunications and Information Services) also offers data transmission.
- Two operators, *Access Télécom* and *Télécom-Plus*, sell paging services and beepers.
- There were 175,938 land lines in March 2000, which represents a telephone density of 1.2% -- with 2.54% for urban areas and 0.05% for rural areas, and with Dakar having 70% of all lines installed.
- There are nearly 10,000 telecenters,¹⁰³ two thirds of which are in Dakar.
- 65% of Senegalese are reachable by telephone, through public telephones.¹⁰⁴
- Senegal has the largest number of public telephone lines in Africa.¹⁰⁵

⁹³ There are already three underwater cables reaching Senegal: Antinea, between Senegal and Morocco, completed in 1997; Fraternité, between Senegal and the Ivory Coast, completed in 1978; and Atlantis I, between Brazil and Senegal and between Senegal and Portugal, completed in 1982.

⁹⁴ The *Alizé* network covers ten of the country's regional capitals, as well as the cities of Rufisque, Saly, Mbour, Joal, Foundiougne, Ndangane, Taïba, Tivaouane, Touba, Darou Mousty, Richard-Toll, Podor, Matam, Bakel and Cap Skiring (cf. *Sud Quotidien*, January 31, 2000).

⁹⁵ 25% of *Sentel*'s stock is held by private Senegalese individuals.

⁹⁶ *Le Matin*, August 12, 1999.

⁹⁷ According to the ITU, the number of cell phone subscribers in Africa increased by 87% in 1998, as compared with an 11% rise in land-based telephone subscribers (cf. *Jeune Afrique* No. 2029, November 30/December 6, 1999).

⁹⁸ ITU: African telecommunications indicators 1998, p. 102.

⁹⁹ *L'Info7*, January 12, 2000.

¹⁰⁰ *Jeune Afrique/L'intelligent*, No. 2046, March 28 to April 3, 2000.

¹⁰¹ *Sud Quotidien*, April 13, 2000.

¹⁰² ITU: African telecommunications indicators 1998, p. 49.

¹⁰³ *Jeune Afrique/L'intelligent*, No. 2046, March 28 to April 3, 2000.

¹⁰⁴ *Le Journal de l'Economie*, No. 155, March 29, 1999.

- *Sonatel* has 2000 kilometers of fiber optic cable throughout the country.
- Senegal is connected to the Internet by a 64 Kbps connection with the United States, through MCI, and by a 2 Mbps connection with Canada, provided by *Télé globe*.
- There are twelve ISPs,¹⁰⁶ eleven in Dakar and one in Saint-Louis.
- Fifty entities are connected to the Internet via a dedicated lines through *Sonatel*.¹⁰⁷
- Four hundred domain names have been registered by the National Internet Center in Senegal.¹⁰⁸
- There are more than 300 sites and web pages.¹⁰⁹
- One IP network, *Sentranet*, with 155-Kbps, 34-Mbps, and 2-Mbps connections,¹¹⁰ has been in operation since April 1999, and links all of the country's secondary cities, making intranet and extranet operations possible.
- An initial license for satellite operation has been granted to *Iridium*, which officially began activities in Senegal at the beginning of October 1999.¹¹¹

In considering these facts, however, it must be borne in mind that the city of Dakar alone accounts for 70% of the telephone subscribers,¹¹² while coverage of rural areas is still inadequate for those who live far from main roads.¹¹³ According to *Sonatel* projections, the number of subscribers should reach 200,000 in 2000, 300,000 in 20002, and 400,000 in 2006. There will be emphasis on extending service to at least 1000 rural localities by 2005, covering all centers with administrative status, which have had telephone connections since the end of 1998. In terms of public telephones, the objective is to have one calling center or public phone booth per 1000 inhabitants by 2000, bringing the density of telephone service from 1.23 to 2.5 per 100 inhabitants. According to this policy, more than 50% of rural village centers should have at least one telephone line accessible to all of the people. The goal is to put every citizen within 5

¹⁰⁵ The rate was 6.2% for Senegal in 1996, as compared with 2.2% in South Africa (Cf. ITU: African telecommunications indicators 1998, p. 26)

¹⁰⁶ Of these, six are private sector entities (*Télécom-Plus*, *Metissacana*, *Arc Informatique*, *Cyber Business Center*, *Point Net* and *West African Information Technology*), four are public sector or semi-public (Office of the Prime Minister, Ucad, Ugb and Trade Point), one is an international organization (Aupelf-Uref) and one is from the associative sector (Enda Tiers-Monde).

¹⁰⁷ In April 2000, there were 8 low-speed connections (33.6 Kbps or less), 26 connections at 64 Kbps, 10 at 128 Kbps and 3 at 256 Kbps.

¹⁰⁸ Along with these domain names of Senegalese entities, there are an additional 500 names that are inactive but reserved by large companies outside the country (e.g., www.shell.sn).

¹⁰⁹ Cf. on-line list of websites compiled by Osiris (<http://www.osiris.sn>)

¹¹⁰ *Le Soleil*, July 31, 1999, Multimedia column.

¹¹¹ This service is beyond the reach of the vast majority of Senegalese, since it requires an outlay of 950,000 CFA francs for the device, a deposit of 1,364,000 CFA francs and a monthly fee of 18,000 CFA francs. In addition, the following communications costs apply: a communication that goes from *Sonatel* to Iridium costs 2,347 CFA francs per minute; communication between two Iridium subscribers costs 982 CFA francs per minute; and communication from Iridium to *Sonatel* costs 1,867 CFA francs per minute (Cf. *Le Soleil*, October 7, 1999).

¹¹² The fact that 75% of the country's economic activity is concentrated in Dakar can not be ignored.

¹¹³ United Nations system in Senegal: Evaluation commune de la situation du pays. August 1998, Dakar, p.66.

kilometers of a telephone.¹¹⁴ As far as large projects are concerned, there is the West African underwater SAT3 cable, which should be operational during the year 2000;¹¹⁵ the use of local area networks with CDMA technology;¹¹⁶ the implementation of satellite communications systems involving partnerships with operators such as *Globalstar*, *Iridium* and *Skybridge*; the Technopole video communication center, which is being put into operation; and xDSL (ADSL, HDSL, etc.) technologies, which are being used to obtain high speeds via conventional dual copper wire. *Sentel*, in turn, has set itself the goal of reaching 20,000 to 30,000 subscribers by 2001.¹¹⁷ To do this, *Sentel*, in the first quarter of 2000, committed to extending its network along the Diourbel-Kaolack-Ziguinchor axis before moving into the Thiès and Saint-Louis areas.

Today, based on quality indicators of network functioning and productivity, as well as on purely financial indicators, the International Telecommunications Union considers Senegal the second most advanced country in terms of telecommunications.¹¹⁸ Nevertheless, as Pathé Diagne emphasizes, it must be noted that “its technological and financial capacity have relied essentially on levies on the domestic client base and on private and public enterprises,” and that its management “attests to a monopolistic policy that is diametrically opposed to sound competitive development strategy.”¹¹⁹ Taking into account the small number of subscribers, the high investment cost and the cost of communications as a proportion of household and business budgets, Pathé Diagne concludes that *Sonatel* has failed in the telecommunications development mission assigned to it by the government.¹²⁰ Though this conclusion is, no doubt, somewhat extreme, the assessment, in general terms, is valid.

4. Legal and regulatory environment

Since 1981, Senegal has separated national from international telephone operations, placing the former under the Directorate of Posts and Telecommunications (OPT), and the latter under *TéléSénégal*.¹²¹ Subsequent to the Senegalese telecommunications conference, held on June 15-18, 1983, the country undertook (in 1985) to reform the telecommunications sector's legal and regulatory environment. Thus, Law 72-39 of May 26, 1972, which provides for the organization of the sector, underwent profound changes. The main result of this was to create a separation between postal and telecommunications operations, by forming two entities: the *Office des Postes et de la Caisse d'Epargne* (OPCE) and the *Société Nationale des Télécommunications* (*Sonatel*). As a public enterprise, designed to prevent the development of a monopoly on service in the telecommunications sector, *Sonatel* also was given the task of regulating the sector, thus making it, in effect, both judge and interested party. This system prevailed until 1994, when the Directorate of Postal and Telecommunications Management and Research (DERPT) was created.¹²² In 1992, the National Telecommunications

¹¹⁴ Ministry of Communication; Ministry of Economy, Finance and Planning: *Déclaration de politique de développement des télécommunications sénégalaises (1996-2000)*, Dakar, March 1996, p. 3.

¹¹⁵ The SAT3-WASC and SAFE underwater fiber optic system will connect Dakar with the Cape via the countries of the West African coast, and will be extended to Southeast Asia and the Far East.

¹¹⁶ Code Division Multiple Access. Broad-band technology with 4 to 5 times the capacity of GSM and with better communications quality.

¹¹⁷ *Walfadjri*, September 8, 1999.

¹¹⁸ CIDIF: *Etat des télécommunications 1999*, <http://inforoutes.cidif.org/documents/consultation.cfm>

¹¹⁹ DIAGNE, Pathé: *Le Sénégal à la croisée des chemins: Scénario de transition vers le 21^{ème} siècle*. Working paper, USAID, ca. 1997, p.12.

¹²⁰ DIAGNE, Pathé: *La Sonatel et les autoroutes de l'information*. Working paper, USAID, ca. 1997, p. 2.

¹²¹ GADIO, Cheikh Tidiane: *Institutional reforms of telecommunications in Senegal, Mali and Ghana: The interplay of structural adjustment and international policy diffusion*. Ph. D., Ohio State University, 1995, p. 182.

¹²² Decree 94-896, 5 September 1994.

Coordinating Committee decided to host a seminar on change in the telecommunications and information technology fields. The seminar was held in 1994, and led to the creation of a National Assessment Committee whose purpose was to evaluate the nation's telecommunications options and whose primary mandate was to assess and classify different telecommunications services with a view to the possibilities for liberalization. An extensive debate then began under the aegis of the GRCC,¹²³ dealing with issues of liberalization, privatization, deregulation, the concept of making shares of heretofore public enterprises available to the private sector, etc. This debate remained confined essentially to political decision-making circles, technical personnel, private sector managers, and funders, while effectively excluding the other sectors of society.

Following two seminars in August and September 1995 on new information and communications technologies, a joint government/private-sector commission was created to devote further thought to the subject and define principles for restructuring the sector to create an environment conducive to private investment and to carry out activities to encourage growth. At the end of October 1995, a set of guidelines for sectoral restructuring was proposed, along with draft legislation for a telecommunications code. A final seminar was held, at the end of November 1995, with all of the players in the sector, and consensus was reached on guidelines for reforming the sector, including liberalization of the market and privatization of *Sonatel*.¹²⁴ In early December 1995, the text was presented to the government, and in January 1996, a new telecommunications code was approved, based generally on the ideas of the GRCC, which had played a key role in the process leading up to the legislation. The privatization of *Sonatel* was provided for, and a regulatory system was mandated, calling for three parallel and coexisting regimes:

- a monopoly structure for land-based telephony, telex, telegraph, international access and packet-based data transmission, up to 2006;
- regulated competition for networks;
- free competition for value-added services.¹²⁵

The new telecommunications code does not create fundamental changes in the sector, since *Sonatel* retains a monopoly on telecommunications services until December 31, 2006, at the latest. Privatized in December 1997, through an offering of shares to private investors,¹²⁶ 42.33% of *Sonatel* is now held by *France Télécom* through its subsidiary, *France Câble et Radio*,¹²⁷ while the remaining shares are held by the Government of Senegal (24.33%), by employees (10%), and by small investors (23%). The most obvious result of this privatization has been to replace the State monopoly with a monopoly held primarily by *France Télécom*—i.e., replacing it with ownership by a foreign State (France). Thus, it is no exaggeration to speak of the “recolonization” of a large sector of the economy. Worse still, the “privatization” of *Sonatel* is considered by some Senegalese experts to be “the worst mess the Senegalese Government has ever perpetrated,” since it consisted of selling *France Télécom* -- a well-

¹²³ Discussion Group on Competitiveness and Growth, created through a decision of the Ministry of Economy, Finance and Planning, including representatives of all the segments of the country's economic community.

¹²⁴ Presentation by Hamath Sall, Secretary General of the GRCC, at the coordinating forum for participants in the *Stratégie Acacia-Sénégal*, December 17-18, 1997, Dakar.

¹²⁵ Law 96-03, February 22, 1996.

¹²⁶ See HAIDARA, Abdoul Wahab: L'introduction de la *SONATEL* à la BRVM. Masters thesis, School of Economic and Management Sciences, Dakar, 1999, 31 pp. + annexes.

¹²⁷ At the time of the *Sonatel* privatization, *France Télécom* had acquired 33% of the stock for 65 billion CFA francs, 17.66% of the stock had been sold to the public in the West African Economic and Monetary Union (WAEMU) zone, and 10% to *Sonatel* employees.

performing company¹²⁸ that brought its new owner 31 billion CFA francs in dividends for 1997 and 1998, and that spends 1.5% of its sales revenue to pay for the transfer of knowledge and for technical and trade assistance – for 90 billion CFA francs.¹²⁹ This unique “privatization” does not, in any real sense, constitute liberalization of the telecommunications market, since in the most profitable segments of the market, monopoly is the rule and competition the exception. Thus, although there are two cellular telephone operators today,¹³⁰ as stipulated by law, *Sonatel* retains a monopoly on international mobile communications into 2006. In short, contrary to the Government’s commitments under the basic telecommunications agreement of the World Trade Organization, and despite repeated public statements, the Telecommunications Regulation Agency, which was to be established by December 31, 1997, at the latest, to replace DERPT,¹³¹ has yet to come to being. Thus, the preexisting operator continues to dictate the rules to its current and future competitors, with the benevolent complicity of the Ministry of Communication, which once had oversight over *Sonatel*.

Insofar as the tax and customs regime is concerned, Law 98-36, relating to changes in customs duties under the tariff regime, and Law 98-37, changing and finalizing certain provisions in the general tax code regarding value added tax, went into effect on April 17, 1998. This reform is consistent with the policy defined by the Treaty of the West African Economic and Monetary Union (WAEMU), working to harmonize customs tariffs,¹³² and includes a significant reduction in port dues.¹³³ A zero tariff is henceforth to apply to priority products of a social, cultural or scientific nature, including computer and telematic equipment not manufactured locally.¹³⁴ This type of equipment, which was taxed at 26% in the past, is now subject to a 5% tax. A distinction must, however, be made within the category of computer equipment, since peripherals (printers, scanners, CD-ROM readers, etc.) and the electrical equipment that goes with them¹³⁵ are only subject to a reduction of from 55% to 61% for the former, and 55% to 73% for the latter. In addition, there is some vagueness as regards the designation of accessories, though they play an important role in the sector. Computer professionals, taking all of this into account, indicate that the average price reduction to consumers has been no more than 15%.¹³⁶ Furthermore, according to the new provisions, computer and telematic equipment manufactured locally is subject to a 25% tax. This particular regime is a good demonstration of the lack of coherence in government policy, which, on the one hand, claims to promote the development of a local telecommunications equipment industry,¹³⁷ while, on the other, it lifts taxes on imported equipment and imposes taxes on locally produced equipment.

¹²⁸ In 1995, *Sonatel*’s profitability was 56.91%, while enterprises such as NTN, AT&T and Southwestern Bell posted at most 14%. Cf. Pathé Diagne: *La Sonatel et les autoroutes de l’information*. Working paper, USAID, ca. 1997, p. 2.

¹²⁹ *Nouvel horizon*, No. 172, June 4, 1999.

¹³⁰ In June 1999, *Sonatel*’s general meeting of shareholders approved the creation of a subsidiary, *Sonatel Mobiles*, held 100% by *Sonatel*, which will be responsible for the cellular telephony activities.

¹³¹ International Telecommunications Union: *Etude de cas sur l’évolution de l’environnement international des télécommunications: Sénégal*, ICEA, Paris, February 1998, p. 11.

¹³² *Le Soleil*, April 20, 1998.

¹³³ Port dues, which ranged from 5% to 55% (not including VAT), according to the product involved, dropped to 0% to 30 % (including the 5% customs stamp).

¹³⁴ *Le Matin*, April 20, 1998.

¹³⁵ Particularly inverters.

¹³⁶ *Sud Quotidien*, April 21, 1998.

¹³⁷ Government of Senegal: *Déclaration de politique de développement des télécommunications sénégalaises (1996-2000)*, Dakar, March 1996, p. 3.

5. International cooperation initiatives

Since the early 1990s, bilateral and multilateral international cooperation has been involved in many initiatives to promote Senegal's ability to take advantage of information and communications technologies. These initiatives are externally oriented, in the sense that they are formulated with a foreign perspective and lack a real connection with Senegal. They are designed in a framework that does not necessarily bear any connection to Senegalese policy or to the needs of the beneficiaries. Furthermore, given the more or less overt rivalries that exist between nations and international organizations, these initiatives are scattered and lack synergy. It must, however, be acknowledged that they have played a decisive role in the development of the Internet in Senegal.

Thus, at the end of the 1980s, the first internet nodes were installed by two different groups: the French research organization, ORSTOM, through its RIO network,¹³⁸ and *Enda Tiers-Monde*, an international NGO that functions as the representative of a London-based NGO, the Alliance for Progressive Communication (APC).

In 1992, as part of the Intergovernmental Informatics Program (IIP), UNESCO began a project called Regional Informatics Network for Africa (RINAF), with an estimated cost of \$US12 million. The purpose of the project is to encourage the development of national networks, in order to significantly increase access to science and education. In the initial phase, five regional nodes and ten national nodes are planned. In Senegal, the National Center for Science and Technology Documentation serves as the West African regional node, providing connection to the Internet for 13 Senegalese institutions, including the computer laboratory of the *Ecole Normale Supérieure*, the Office of Forecasting and Statistics (DPS), the Office of Urban Planning and Architecture (DUA), the Commission on Scientific and Technical Affairs (DAST), the library of the Université Cheikh Anta Diop de Dakar, the library of the Université Gaston Berger de Saint-Louis, and the Commission for Informatics Development. However, due to what has been described as rather sporadic central planning and the absence of adequate funding, RINAF was destined to become relatively inactive and was left behind by the rapid development of the Internet.

In the mid-1990s, AUPELF-UREF, the *Agence Universitaire de la Francophonie*, played an important role in creating the SYFED Center at the Université Cheikh Anta Diop de Dakar, which had the first web server in Senegal. This server serviced tens, and then hundreds, of academics (professors, researchers and students), allowing them to break out of their isolation, by rapidly lowering the cost of communications.

Another international cooperation project in the Francophone world was the @frinet project, in which the Canadian Agency for International Development (CIDA) and the *Agence de la Francophonie* (ACCT) installed a server for the Government of Senegal, which began operating on February 20, 1997. This project was followed by a second phase, the *Afriweb* project, carried out by the *Agence de la Francophonie* with support from the Government of Quebec. The objective was to support the conception of developing Francophone sites in certain West African countries, including Senegal.

The United Nations system also played an important role, through the United Nations Conference on Trade and Development (UNCTAD), the International Telecommunications

¹³⁸ In the framework of a policy to implement computer networks in the southern countries, ORSTOM installed a Senegalese node as part of its RIO network in 1989..

Union (ITU) and the United Nations Economic Commission for Africa (UNECA). Thus, when the Global Trade Point Network (GptNet) was initiated in 1994, following the recommendations of the Eighth United Nations Conference for Trade and Development in Cartagena, Colombia, Senegal was enlisted for the pilot phase. The Trade Point Foundation was created in order to streamline international trade procedures. It included the National Federation of Senegalese Employers (CNES), the Chambers of Trade, Industry and Agriculture (CCIA), the International Foreign Trade Center of Senegal (CICES), the Senegalese Entrepreneurs Group (GES), *Sonatel*, and the Government. Following the project's identification phase, mechanisms to facilitate procedures, along with a new set of such procedures, were proposed and approved. This led to the definition of list of information technology responsibilities for the development of applications, with technical support from the United Nations Trade Point Center (UNTPDC) in Melbourne, Australia and to provision of the equipment necessary to put the trade facilitation center into operation in January 1998.

The International Telecommunications Union (ITU), through its Office of Telecommunications Development, began a pilot project in telemedicine, designed to link hospitals in Dakar with hospital services in the Saint-Louis region.

The main policy recommendations of the document approved by the 31st session of the United Nations Economic Commission for Africa and the 22nd Conference of Ministers Responsible for Economic and Social Planning and Development, entitled "African society in the information society,"¹³⁹ were incorporated in the Ninth Plan for Economic and Social Development (1996-2001).

Also, as part of the Acacia Initiative, the International Development Research Center (IDRC) began a preliminary study¹⁴⁰ in 1996 that led to defining Senegal's "Acacia Strategy."¹⁴¹ The central idea of the program is to assist communities at the grassroots level to incorporate information and communications technologies. This is less a question of providing computers and connections, as is often the case, than of studying the new opportunities which these tools offer for solving development problems and providing ways of introducing, using and incorporating these technologies at the grassroots level. The Center is also involved in supporting implementation of the future Telecommunications Regulatory Agency, and funded an extensive study designed to provide the basis for national telecommunications services policy.

Since 1997-98, the World Bank's World Links for Development (WorLD) project has made it possible for 20 teaching institutions to connect to the Internet, and a similar number is expected to follow by 2001. The project focuses on five principal areas:

- connectivity in schools (equipment, internet connections, "sister school" links;
- partnerships with the private sector to generate and assure the resources needed to expand the program beyond the pilot phase;

¹³⁹ This work is the result of a process carried out with participation by the International Telecommunications Union (ITU), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Development Research Centre (IDRC). It involved asking a group of experts to analyze the African situation and formulate proposals and recommendations, to serve as a frame of reference for African countries in developing a policy on connection with the information superhighway, in order to bridge the gap that separates information-rich from information-poor countries, and use ICTs to further Africa's economic and social advancement.

¹⁴⁰ SAGNA, Olivier; SOW Fatoumata: Etude préliminaire à l'élaboration de la stratégie ACACIA Sénégal, IDRC, Dakar, December 1996, 48 pp.

¹⁴¹ TOURE, Pape Gorgui: Stratégie Acacia au Sénégal, IDRC, Dakar, January 1997, 61 pp.

- telecommunications policy regarding the reduction of telecommunications rates to benefit the education sector;
- training heads of educational establishments, as well as teachers, students and technical personnel;
- monitoring and evaluation to measure results and assess the impact on educational quality.

Lastly, one of the most recent initiatives in Senegal is the Leland initiative, for which Senegal and the United States signed a protocol agreement in May 1998 during Bill Clinton's visit to Senegal, intended to "promote internet access and use." The objectives of the initiative are:

- to create a favorable policy environment that promotes reform, with the aim of introducing information technologies and reducing obstacles to connectivity;
- to help create a viable local internet services industry; and
- to develop applications in the framework of lasting development, in order to increase the capacities of African societies in the use of communications and information.¹⁴²

6. Information technology and the public sector

Operating under significant budgetary restrictions, given the structural adjustment policies initiated in the early 1980s, the Senegalese Government has approximately 60,000 employees, of whom 60% are men and 40% are women. The average age is 43 years old, with an average seniority of 18 years. The main centers at which key computer specialists work are:

- the Office of Automatic Data Processing (DTAI) at the Ministry of Economy, Finance and Planning;
- the Office of Records (DAF) at the Ministry of the Interior;
- the Customs Information Center (CID);
- the Oceanographic Research Center of Dakar-Thiaroye (CRODT), which is part of the Senegalese Agricultural Research Institute (ISRA); and
- the Commission for Informatics Development (DINFO).

In 1997, the Office of the Prime Minister installed an internet node with assistance from Canadian cooperation and the *Agence de la Francophonie*. This includes a local network linking more than 80 points, serving the Office of the Prime Minister and the General Secretariat of the Government. Other branches of the Government were later connected via *Sonatel*. These include the Office of the President, the Ministry of Foreign Relations, the Ministry of Economy, Finance and Planning, the Ministry of the Interior, the Ministry of Energy, Mines and Industry, and the Office of the Commissioner of Food Security.

As has been indicated, DINFO is officially responsible for fostering and coordinating the computerization of semi-public departments and bodies. Its role is to provide advice and guidance to government entities in the computerization process. In reality, however, most computer equipment is not purchased with government funds, but through projects funded by other sources, and are administered by people who often do not have the necessary skills. There are, therefore, no precise statistics on government computer equipment, making it

¹⁴² The basic information in this section comes from a study by the author carried out for IDRC, entitled *Les initiatives de la coopération internationale en matière de technologies de l'information et de la communication au Sénégal*, IDRC, Dakar, December 1997, 48 pp.

difficult to assess the general level of advancement in information and communications technology within the Government.

According to a recent study,¹⁴³ the overall level is poor, with 80% of the employees interviewed stating that the number of computers is inadequate for the actual needs. The Government's computer equipment consists essentially of stand-alone microcomputers. Eighty-five percent of the agencies questioned transfer information manually; electronic transmission of information has not yet become part of the work habits of employees. Furthermore, due to the lack of anti-virus systems or a failure to update them, computers are often virus-infected.

The increasing use of information and communications technologies has, however, given rise to a new type of government employee. Such employees have knowledge of how to handle computer tools, and while they are not computer experts, they function as a valuable resource within their departments, thus reducing, to a certain extent, the importance of support organizations such as the Commission for Informatics Development. The training of government employees in information and communications technologies remains a major concern because of the average seniority of employees, the fact that most have no training, and the fact that, at present, the possibilities for future training are virtually nil.

In terms of internet use, an estimated 500 persons within the government (or 8% of workers) subscribe to internet services. Of this number, 36% are connected through the server at the Office of the Prime Minister,¹⁴⁴ which hosts approximately 200 internet accounts, while the remainder of accounts are with private providers. Ten ministerial departments have web sites,¹⁴⁵ and seven of these are hosted by the Office of the Prime Minister. Ministerial sites most often provide information on the institution (the ministry's mission, an organizational chart, current projects and programs, etc.), but offer no online service to citizens, and very little, if any, interactivity. Though these sites are often created internally, the main problem is that of updating data.

To remedy this situation, the Government has in place extensive plans involving the use of information and communications technologies, such as the Government Voice and Data Transmission Network (RACV), Regional Units for Information and Development (URID), under the Ministry of the Interior, and an intranet system within the Ministry of Economy, Finance and Planning.

As the result of a loan from the West African Development Bank (WADB), Senegal hopes to implement a communications network that will improve communication between the various offices of the Government, while reducing telecommunications costs. The modernizing of equipment, the creation of new services, and the implementation of a government intranet should provide the Government with a private network including both telephony and data transmission. The implementation of this network should result in an integrated decision-

¹⁴³ ESMT; Globenet; Fondation du Devenir: Les Nouvelles Technologies de l'Information de la Communication dans l'administration sénégalaise. Dakar, October 1999, 31 pp.

¹⁴⁴ In Senegal, the "Primature," or Office of the Prime Minister, oversees activities related to the Prime Minister.

¹⁴⁵ Those involved are the Ministry of the Interior, the Ministry of Economy, Finance and Planning, the Ministry of the Environment and Protection of Nature, the Ministry of Education, the Ministry of Energy, Mines and Industry, the Ministry of Culture, the Ministry of the Family, Social Action and National Solidarity, the Ministry of Fisheries and Maritime Transport, the Ministry of Tourism and Air Transportation, the Ministry of Science and Technology Research, and the Ministry of State Modernization.

making system (SIID), which it is anticipated will become operational in the first half of 2000.

The Ministry of the Interior has developed a project called Regional Units for Information and Development (URID), designed to create local data bases covering different areas of activity of local groups, providing government officials¹⁴⁶ the technology to manage the data bases and facilitate dissemination of their contents at the local level and centrally. Two local networks were installed at the Office of Records (DAF), and both regional governments and prefectures have been equipped. An experimental application has been developed, but lack of funds has so far prevented it from being implemented.

Finally, the Ministry of Economy, Finance and Planning plans to implement an information and communications system to facilitate internal and external information exchange. The project is called SICOMEFP, and includes both internal services (e-mail, reviews and press releases, reports on meetings, economic and financial news, texts of laws, circulars, notifications, announcements of internships available, etc.) and external services (structural adjustment plans, economic indicators for sector-specific projects, data on privatization and deregulation, the tax code, customs tariffs, procedural guides, etc.). The project is in the initial stages, with servers and cable in the process of being installed.

7. Information technology in the economy

Information and communications technologies constitute both a branch of industrial activity and one of the most important factors of production in the other sectors. In 1996, telecommunications represented 2.6% of GDP, ranking Senegal as a country where this sector, compared to other sectors, is highly developed – with this percentage ranging between 1.7% to 2.8% in most industrialized or industrializing countries.¹⁴⁷ The Government's aim is to bring this percentage to 3.5% by 2000.¹⁴⁸ It should be emphasized that the tertiary sector, in general, represents 51.6% of GDP, providing the greatest contribution to the country's wealth.¹⁴⁹ In 1998, *Sonatel's* sales revenue was 90 billion 695 million CFA francs, and its net after-tax profit was 36 billion 246 million CFA francs, representing a 21% increase over 1997.¹⁵⁰ For 1999, this figure should reach 100 billion CFA francs, and the net after-tax profit should reach 40 billion CFA francs.¹⁵¹ Cellular telephony alone, which is developing rather dramatically, represents 10 to 12 billion CFA francs of *Sonatel's* sales revenue.¹⁵² Recently released figures for the first half of 1999 show an increase of 16% over the first half of 1998, with a corresponding increase in net profits.¹⁵³

¹⁴⁶ Regional governors, prefects in departments, and sub-prefects in *arrondissements*.

¹⁴⁷ International Telecommunications Union: Etude de cas sur l'évolution de l'environnement international des télécommunications: Senegal, ICEA, Paris, February 1998 p. 9.

¹⁴⁸ Ministry of Communications, Ministry of Economy, Finance and Planning: Déclaration de politique de développement des télécommunications sénégalaises (1996-2000), Dakar, March 1996, p. 3.

¹⁴⁹ UNCTAD. Coordinated African Programme of Assistance on Services, Annex 3 Findings on Senegal, 1995, p. 5. Though the primary sector represents only 20% of GDP, three quarters of the active population earn their living from agriculture.

¹⁵⁰ *Le Soleil*, April 29, 1999.

¹⁵¹ *Le Soleil*, November 24, 1999.

¹⁵² *Walfadjri*, September 8, 1999.

¹⁵³ *Sonatel*: Financial report for the first half of 1999 (advertising published in *Walfadjri*, September 16, 1999)

In terms of telecenters, specifically, an initial study in 1995 showed that they employed over 4,000 persons, with annual sales revenue of 9.2 billion CFA francs, representing 5.5% of *Sonatel*'s sales revenue.¹⁵⁴ It is estimated that these telecenters were responsible for creating more than 10,000 jobs between 1992 and 1998, and they represented between 12% and 15% of *Sonatel*'s sales revenue for 1998.¹⁵⁵ Though generally viewed favorably, the centers are criticized by Pathé Diagne as being part of a "poor man's communications scenario," since they only generate "precarious and low-income jobs."¹⁵⁶

The level of investment has grown considerably, from 25 billion CFA francs before privatization to 48 billion CFA francs in 1998, with 62 billion CFA francs anticipated for the 1999-2001 period.¹⁵⁷ In September 1999 alone, *Sonatel* invested 4 billion CFA francs to upgrade its *Alizé* network in the Dakar area, and plans to open a site at Tambacounda, which will allow it to cover Mali, as well.¹⁵⁸ *Sonatel* also issued five-year bonds for 12 billion CFA francs at 7% interest in November 1999, to finance future investments.¹⁵⁹ *Sentel*, the second largest mobile telephony enterprise, will invest US\$23 million (approximately 13.8 billion CFA francs) between 1999 and the beginning of 2000 to build its network.¹⁶⁰ In all, according to the Ministry of Economy, Finance and Planning, the growth rate in the telecommunications sector was estimated at 9.5% in June 1999, as compared to 6% for the overall economy.¹⁶¹

In addition to their importance as a sector of the domestic economy, information and communications technologies are playing an increasingly important role as a factor of production. In the import-export sector, *Trade Point Senegal* has been offering a trade information service called Infocom, since October 1998, which uses the Internet to present several hundred business opportunities daily.¹⁶² With the assistance of the International Development Research Center (IDRC), it began, as of July 1999, to decentralize its activities by creating local offices in the Thiès and Saint-Louis areas to provide access to trade information and to virtual markets, for economic agents based in these areas. Furthermore, Orbus 2000, a facility providing various services, has an electronic customs clearance system that has been partially operational since the beginning of 2000. *Trade Point Senegal*'s goal for 2003 is to reduce the administrative costs of foreign trade by 75%, reduce processing time by 70% and establish customs clearance times of 15 minutes, as compared to the current 6 to 10 days required.¹⁶³

In other sectors of the economy, business managers are increasingly aware of the importance of information and communications technologies. Though large companies are generally computerized, small and medium-sized businesses that were at the periphery of these developments are increasingly equipping themselves with microcomputers for administrative purposes. The vast majority of businesses are still without internet access, and those with access generally use it strictly for e-mail or to promote their wares on web pages providing little interactivity.¹⁶⁴ In terms of transportation, 1999 saw the appearance of a radio-dispatched taxi

¹⁵⁴ ZONGO, Gaston: Impact socio-économique et financier des télécentres privés, op. cit. p. 12-15.

¹⁵⁵ Les télécentres ont démocratisé le téléphone. *Radio Actions* No. 20, July-September 1999, p. 11.

¹⁵⁶ DIAGNE, Pathé: Le Sénégal à la croisée des chemins: Scénario de transition vers le 21^{ème} siècle. Op. cit.

¹⁵⁷ *Nouvel Horizon* No. 172, June 4, 1999.

¹⁵⁸ *Walfadjri*, September 8, 1999.

¹⁵⁹ *Walfadjri*, November 17, 1999.

¹⁶⁰ *Le Matin*, August 12, 1999.

¹⁶¹ *Le Soleil*, September 6, 1999.

¹⁶² Cf. <http://www.tpsnet.org>

¹⁶³ Trade Point Senegal Foundation: Pôle de commerce électronique du Sénégal, Dakar, April 1999, p. 1.

¹⁶⁴ Cf. proposals by Abdoulaye Ndiaye at the UNRISD seminar on January 31, 2000 in Dakar.

company in Dakar. The increasing role of information and communications technologies in the economy, however, highlights the problem of human resources training and, more specifically, of the education-employment interface. New technologies create new occupations, either through the modernizing of already existing jobs or by creating entirely new jobs, and both involve the need for new training.¹⁶⁵

The Industry Observer disseminates a set of data bases on the status of industrial enterprises, whose performance can be tracked by indicators relating to jobs, management pay, production, factors of production, investment, import and export, etc.¹⁶⁶ Finally, it should be noted the use of information and communications technologies is not limited to the so-called “modern” sector: cellular telephony has had great success among economic agents in the informal sector, whether merchants or those involved in small-scale industries. Merchants are also making increasing use of *Trade Point* services, using e-mail or browsing the Internet to search out business opportunities.

8. Information technologies and governance

While the State has played a critical role in defining and implementing policy in the information technology and telecommunications sectors, it has been considerably less successful using information and communications technologies in the area of governance. Apart from the Government’s web site¹⁶⁷, which serves primarily as a political showcase, there are virtually no applications of interest to the general population, particularly applications that provide them the benefit of more effective and transparent administration.

In order to deal with the deterioration of certain important documents, particularly civil registries, the Commission for Informatics Development initiated a major project in the 1990s, at the Rufisque Civil Registry Center, to establish electronic records in Digital Optical Disk format. The objectives of this experimental project, which was part of a policy to modernize extensive government records, were:

- to halt the deterioration of civil registries;
- to improve the quality of public service; and
- to enhance the effectiveness of personnel..

A second stage envisaged the issuing of documents at civil registry offices, with a subsequent expansion of the project to the national level, providing all of the regional capitals with computerized civil registry centers, modeled on the commune of Rufisque, and equipping the National Civil Registry Center with a system allowing it to centralize all civil registry data¹⁶⁸. However, with the exception of a similar project implemented by the commune of Dakar, the widespread computerization of the civil registry, which had been anticipated, has not occurred. Furthermore, in the case of Rufisque, as in that of Dakar, information and communications technologies have been used primarily to preserve data, rather than to improve the preparation of civil registry documents, which are always issued by hand under

¹⁶⁵ SAGNA, Olivier: *Nouvelles technologies, nouveaux métiers, nouvelles formations*, in *L'Ecluse, Bulletin d'Information de la Banque d'Internationale d'Information sur les Etats Francophones*, First quarter 1996, Vol. 8, No. 1, p. 13-14.

¹⁶⁶ Cf. <http://www.obs-industrie.sn>

¹⁶⁷ Cf. The Government of Senegal’s web site address is <http://www.primature.sn>.

¹⁶⁸ NDIAYE, Momar Ali: L’impact des technologies de l’information sur le développement économique et social, ICT High Level Working Group of the CEA for the development of the AISI, 1996, <http://www.idsc.gov.eg/aii/senfst.htm>.

extremely poor conditions (chronic lack of forms, long issuing delays, etc.), leading to various forms of parallel-market activity.

To date, the most notable use of information and communications technologies to improve governance has undoubtedly been their use in the electoral process. Indeed, since the legislative elections of December 1996, the opposition parties have been so forceful in questioning the reliability of the electoral registers that the Ministry of the Interior decided to make them available on the Internet¹⁶⁹. Any person on voter lists could thus verify whether he or she had, in fact, been properly registered, and could also determine the correct polling location at which to vote on election day. Admittedly, this resource was exploited primarily by the political parties and by the media, which were able to conduct large-scale checks and detect certain irregularities. However, given the small number of Senegalese with access to the Internet, and in the absence of public consultation offices, the vast majority of citizens were unable to take advantage of this innovation. At the same time, this initiative was sharply criticized by immigrants: the electoral registers provided not only the identity of the voters, but their filiation, as well, and one of the unanticipated consequences of making this information available on the Internet was to arouse the concern of illegal immigrants, who regarded this tool as a means for the police in countries where they formerly lived to determine their true identity. In the face of increasing protest, the Ministry of the Interior ultimately decided to only make available voter-related information.

The Presidential election of February 2000 saw a repetition of the experience, and the National Elections Monitor (ONEL) established a web site for the occasion.¹⁷⁰ Political groups, for their part, have not remained on the sidelines of this phenomenon: for the first time in Senegal's electoral history, political parties, such as And Jëf-PADS¹⁷¹ and the Socialist Party¹⁷², support structures, such as the *Coalition Alternance 2000*¹⁷³, as well as the candidates Abdou Diouf¹⁷⁴ and Abdoulaye Wade,¹⁷⁵ waged campaigns over the Internet. Ultimately, ICTs played an important role in the elections, which for the first time in 40 years, led to a change at the highest level of government. Privately-owned radio stations, broadcasting in FM, took advantage of the advent of the cellular telephone to provide unprecedented coverage of the voting, due in large part to the fact that the media had nearly instantaneous access to developments throughout the country. The fusion of radio and cellular telephone added a dimension to the political discourse and made it possible for the people to oversee and closely monitor the electoral process. The main private radio stations deployed hundreds of correspondents, armed with cell phones, ready to report the slightest development, while at the same time providing the Senegalese people the ability, through the thousands of telecommunications centers, to have a voice in reporting events in even the most remote parts of the country. Senegalese abroad, not to be outdone, followed, over the Internet, the debates arranged by the radio stations, read newspaper accounts and, above all, broke new ground by organizing a "*marche bleu*" on the Internet that consisted of meeting, en masse, at "chat" sites and regularly posting messages to confirm their participation in a virtual marches" organized in support of the candidate Abdoulaye Wade, for whom "*marches bleues*" were organized in the towns of Senegal that he was visiting. The near-instantaneous

¹⁶⁹ Cf. <http://www.mint.sn>

¹⁷⁰ Cf. <http://www.onel.org>

¹⁷¹ Cf. <http://www.ajpads.org>

¹⁷² Cf. <http://www.telecomplus.sn/ps>

¹⁷³ Cf. <http://www.alternance2000.org>

¹⁷⁴ Cf. <http://www.abdoudiouf.com>

¹⁷⁵ Cf. <http://www.maitrewade.com>

dissemination of the vote count from polling locations meant that two hours after the close of the voting booths, the Senegalese people knew the unofficial results for each of the candidates, thus hindering any attempt on the part of authorities to manipulate the election results. This use of ICTs to promote transparency and foster the propriety and honesty of the electoral process opened the way for a sort of cyber-citizenship in an environment where one would least have expected it: in a Third-World country where only a minority has access to the Internet. Even more important, this experience clearly demonstrates that ICTs provide a benefit to the people, as long as the technologies are used wisely, in the context of applications designed to solve the greatest possible number of political, economic, cultural, and social problems.

Unfortunately, local groups are generally unaware of the possibilities offered by information and communications technologies, both for their internal functioning and in using the new powers they have gained as a result of the decentralization process. Today, only the municipal governments of Dakar¹⁷⁶ and Rufisque,¹⁷⁷ the regional councils of Diourbel,¹⁷⁸ Louga,¹⁷⁹ Ziguinchor¹⁸⁰ and Tambacounda,¹⁸¹ and the rural community of Ngoundane¹⁸² have a presence on the world wide web, and these are essentially electronic pages providing institutional information on the local entity (legislative and regulatory texts, bodies, functions, decentralized cooperative structures, etc.) designed to promote the politicians involved.

There are, however, initiatives designed to develop applications that can be useful to local groups. Thus, within the Acacia Strategy, the African Society for Education and Training in Development (SAFEFOD), an NGO working for democratic values, has developed applications for the management of local groups, for dealing with the civil registry budget, for printing a variety of documents, etc. These applications are currently being tested at SAFEFOD sites before undergoing field testing, prior to possible dissemination. SAFEFOD also has a project in “observing local government,” and has a website¹⁸³ and a local server that will eventually provide information on decentralization and on local groups, in French, English, Wolof and Puular, in Soninké, Diola, Seereer and Mandinka.¹⁸⁴ In 1997, SAFEFOD attracted the attention of local elected officials in regard to the potential benefits of geographical information systems (GISs) to local groups.¹⁸⁵

In May 1999, the Dakar office of the s Institute, in collaboration with Sud FM, regional newspapers¹⁸⁶ and a half dozen partners,¹⁸⁷ launched the Internet Network of Information on Decentralization and Local Development (RESIDEL) project.¹⁸⁸ The principal objectives of this project are to:

¹⁷⁶ Cf. http://www.refer.sn/sngal_ct/cop/mairie/contact.htm

¹⁷⁷ Cf. http://www1.cyg.sn/ville_de_rufisque/index.htm

¹⁷⁸ Cf. <http://crdiourbel.ifrance.com>

¹⁷⁹ Cf. <http://www.multimania.com/crlouga/>

¹⁸⁰ Cf. <http://crziguinchor.ifrance.com>

¹⁸¹ Cf. http://www.refer.sn/sngal_ct/cop/crtamba/accueil.htm

¹⁸² Cf. <http://www.tpsnet.org/ngoudiane/default.htm>

¹⁸³ C.f. <http://www1.cyg.sn/safefod>

¹⁸⁴ Currently, only French, Wolof and Puular are operational.

¹⁸⁵ *Gouvernance locale*, No. 6, October 1997, p. 12-14.

¹⁸⁶ *La Dépêche* in Thiès, *Louga Info*, *La Voix de la Cité* in Kaolack, and *Kassumay* in Ziguinchor.

¹⁸⁷ Association of Presidents of Rural Communities (APCR), Association of Mayors of Senegal (AMS), Association of Presidents of Regions (APR), Senegalese Institute of Agricultural Research (ISRA), West African Rural Foundation (FRAO) and National Council for Rural Coordination (CNCR).

¹⁸⁸ Panos Institute: Minutes of the meeting to approve the Internet Information Network on Decentralization and Local Development (RESIDEL), of Dakar, May 21, 1999, 10 pp.

- attempt to use a combination of internet, radio and print media to create an information system to help streamline the flow of information between the capital, rural groups and secondary cities;
- contribute, at the level of decentralized collective structures, to strengthening the capacity of local media and organizations participating in the project and increasing active use of the Internet and radio;
- ensure the production, sharing and dissemination, at the local, national and international levels, of content relating to decentralization and local development, via radio, internet and print media;
- initiate a national dialogue, via internet, among the different players, regarding decentralization and local development;

In regard to the use of information and communications technologies in government, both centrally and at the local level, it must be concluded that no practical information or service is being provided to reduce unnecessary travel, ensure transparency, or increase citizen participation. The number of people on line is, of course, extremely small, and in a country where “classic” democracy is still in its infancy, “electronic democracy” is, at this point, out of the question. It is, however, revealing to note that the opportunities offered by the Internet are primarily being used by central or local governments, rather than to further democracy or serve the interests of individual citizens.

9. Information technologies for education and health

The use of ICTs is most controversial in the education and health sectors. These sectors, which are unable to meet social demands, in both qualitative and quantitative terms. Thus, two arguments are presented: one, that implementing policy relating to the use of these technologies is of relatively little or no use, given the fact that the most basic needs are not being met; and two, that these are ideal areas for the application of these technologies, since they make it possible to solve concrete problems at a relatively low cost.

9.1. Education

Information and communications technologies were introduced in the educational system in the mid-1960s, with experiments involving the use of the radio to teach French, based on the method developed by the Applied Linguistics Center of Dakar (CLAD). This experiment, which lasted from 1964 to 1982, was never evaluated in a truly scientific way, but it was blamed by teachers and parents for lowering the level of student learning and for various scholastic failures, and was abandoned after the Conference on the Status of Education and Training (EGEF), held in 1982.¹⁸⁹ In 1972, a second experiment was undertaken with Télévision Scolaire du Sénégal (TSS). At a time when, despite the fact that 20% of the national budget went to education, only 40% of school-age children attended school, the primary objective of the experiment was to improve the quality/cost ratio of education, in order to increase the rate of school enrollment. With a pilot group of 400 students, the experiment received a positive evaluation from UNESCO in 1981, both pedagogically and

¹⁸⁹ GARRICK, Thomas Adolphe: Technologies de l'Information et de la Communication dans la résolution des problèmes de l'éducation et de la formation au Sénégal: Etat des lieux, pistes d'actions et de recherches, IDRC, Dakar, 1997, p. 12.

economically, but the system was never expanded.¹⁹⁰ In 1982, the Ministry of Science and Technology Research, in cooperation with the *Ecole Normale Supérieure*, initiated the Logo project, in order to study the impact of computer use and of the Logo language on the academic learning of six-year-olds. The results showed that students were able to carry out programming with ease, and that mathematical learning and the comprehension of certain physical concepts were facilitated.¹⁹¹ Some years later, in 1989, the two institutions launched the Project to Introduce Information Technology in the Educational System (PIISE). This project targeted elementary, middle and secondary school education in urban and rural areas. Guides to evaluate teaching programs and programmable machines were produced, and a number of teachers and educators working at vacation resorts were introduced to information technology.¹⁹² Due to a lack of funds, these projects did not proceed beyond the experimental phase, and for a long time no action was taken on their primary conclusions, particularly in terms of introducing computer technology at different levels of the country's educational system. Commenting on this set of projects, in the context of the Ten Year Education and Training Plan (PDEF), the Ministry of Education wrote in February 1998, "These experiments... were limited in time and space, and had only a slight effect on the ability to bring qualitative and quantitative change to a sector as massive as the education sector. This finding highlights the urgency of defining a coherent policy in this field – one that is linked to specific strategies and is commensurate with the stakes involved and with the importance of the sector."¹⁹³

The education sector, however, has played a decisive role in the introduction of the Internet in Senegal, through the Université Cheikh Anta Diop de Dakar. The Internet first appeared in Senegal in 1989-90, with the installation of a node of ORSTOM's RIO network,¹⁹⁴ to which a number of university institutions were connected. In 1992, the Internet authorities gave the computer engineering department of ENSUT,¹⁹⁵ in collaboration with ORSTOM, control of the .sn domain name. Following Senegal's connection to the Internet via *Sonatel*, in March 1996, the Université Cheikh Anta Diop de Dakar continued to play a central role. *Sonatel* campaigned behind the scenes to take over management of the .sn domain name, arguing that its technical skills made this a logical choice. What was at stake, here, was control over domain names in Senegal, and the university opposed *Sonatel*'s plan, arguing that an independent non-profit organization should be responsible for this task. The university's position was that allowing *Sonatel* to gain this power posed the risk that, left under the Government's control, it could, at some future point, end up in the hands of a private company controlled by foreign capital, since the privatization of *Sonatel* was on the horizon. The university ultimately won the battle, and kept administrative and technical control of what then became NIC¹⁹⁶ Sénégal.

Returning to the issue of using technology in the educational system, it was only in 1998 that information technology (or, at least, computers) was introduced systematically in a number of schools, as a part of the World Links for Development (WorLD) program launched at the end

¹⁹⁰ Ibid. p. 14-15.

¹⁹¹ Ministry of Education: Programme Décennal de l'Education et de la Formation, Document de politique sectorielle sur l'utilisation des nouvelles technologies de l'information et de la communication, Dakar, February 1998, p. 5.

¹⁹² Ibid.

¹⁹³ Ibid. p. 11.

¹⁹⁴ Intertropical Computer Network.

¹⁹⁵ *Ecole nationale supérieure universitaire de technologie*, subsequently *Ecole supérieure polytechnique (Esp)*

¹⁹⁶ National Internet Center.

of 1996 by the World Bank.¹⁹⁷ The Bank financed the training of instructors and procurement of equipment (computers, printers, inverters, modems, local networks, etc.), as well as the necessary software, while the State was responsible for internet service subscriptions, telecommunications costs, equipment maintenance, purchase of consumables, and wages for laboratory personnel and for teachers responsible for coordinating the project. Twenty schools are already connected, and by 2001, a total of 40 are expected to be beneficiaries of the project.

Though this project represents definite progress, it entails a number of problems. First, with the State assuming responsibility for connection costs, and for maintenance and purchase of consumables, it is the schools that must ultimately pay the additional costs. Since school budgets are not even sufficient for “normal” functioning, the introduction of computers and internet connections is something of a poisoned gift. Several months after the beginning of the experiment, the first three schools to be connected had their connections suspended, due to their inability to pay the telephone bills involved. Later, a mechanism for student participation was implemented, and an agreement between the Ministry of Education and *Sonatel* was signed, providing special advantages to schools with internet connections.¹⁹⁸ No specific provision has been made for the problem of retrofitting or even replacing obsolescent equipment, and there is the risk that, some years hence, the WorLD project will join the Logo and PIISE projects as exhibits in the museum of experiments that were never pursued.

In the academic community, two large projects are currently in progress:

- The African Virtual University (ABU), with funds from the World Bank, is designed to establish fee-based training using distance learning, in order to “improve access to higher education for the population at large, facilitate the introduction of new fields (the sciences and technology) and provide for ongoing updating of skills.”¹⁹⁹
- The Université Virtuelle Francophone (UVF), funded by the *Agence Universitaire de la Francophonie* (AUPELF-UREF), is designed to make optimal use information and communications technologies, in order to obviate the need for local contact between teachers and students, make existing distance learning products readily available on line, and reengineer exportable products in the French-speaking countries.²⁰⁰

On a more fundamental level, however, the problem is the failure to realize that introducing information technologies in the educational system involves profound changes – changes that will make it imperative to consider an alternative educational model more targeted to creating skills than transmitting knowledge, involving a radical change in the respective roles and responsibilities of teachers and students. While students adapt easily to new situations, and quickly incorporate new technologies in their daily lives (increasing use of radios, television, tape recorders, walkmans, electronic games, etc.), teachers are often hostile to, or at least unenthusiastic about change. This attitude is a result of old pedagogical values, in which

¹⁹⁷ Economic Development Institute of the World Bank: Réseau mondial pour le développement: le programme WorLD, World Bank, Washington, 1996, 18 pp.

¹⁹⁸ Each establishment has access to a RTC line without paying connection costs, and receives a bimonthly grant of 50,000 CFA francs toward the cost of communications, with the remainder paid by the establishment, along with the bimonthly subscription fee for the line. The connected site only has access to the internet server designated by the Ministry of Education. (*Le Soleil*, Multimedia column, May 22-23, 1999).

¹⁹⁹ Ministry of Education: Programme Décennal de l'Éducation et de la Formation, Document de politique sectorielle sur l'utilisation des nouvelles technologies de l'information et de la communication, Dakar, February 1998, p. 6.

²⁰⁰ Ibid. p. 7.

repetition – involving the identical or near-identical reproduction of a static or virtually static model – was a cardinal principle. Today, on the other hand, the world is moving toward an environment in which change is rapid and unpredictable, and where the ability to adapt and innovate is key to success for both individuals and organizations. Thus, for teachers, the introduction of information technologies in the educational system is not simply a matter of modernization, but represents a profound challenge to their practices and to old pedagogical certainties. Previous attempts to introduce new technologies in the educational system have also come up against this impediment, as detailed in an article published in *Le Soleil*. The article mentions that scholastic radio, once widely used and, in its era, a revolutionary teaching tool in Senegal, was abandoned because it was broadly opposed by “nostalgic teachers.”²⁰¹

There does, however, seem to have been some appreciation for this dimension of the situation: UNESCO refers to supporting a “training network for teachers in Senegal” in order to create “an open learning system, connecting training establishments to the online world, increasing their ability to come in contact with new teaching and learning challenges, and helping them to become true community education organizations.”²⁰² Even more encouraging is the fact that the project’s promoters stress that information and communications technologies, in the context of Senegalese education, are only tools to facilitate teaching and learning, taking care to emphasize that “their results do not depend on the technology per se, but on its proper utilization.” They further state, “Great expectations can lead to great disappointment, in regard to the application of these technologies, if sufficient consideration is not given to the actual educational context, including, for example, lack of training among users, the unstable supply of electricity and, most important, the lack of relevance, significance and quality of the educational messages imparted.”²⁰³

The PDEF does propose an overall strategy for the coming years, designed to introduce these technologies for different levels and types of teaching,²⁰⁴ but it is totally silent on the question of how the strategy is to be implemented. Placing computers in schools, and training teachers to use them is all very well, but the issue of cost remains to be addressed. Notwithstanding the fact that the technologies are used as a teaching tool within the formal educational system or as the backbone of a distance learning system designed to compensate for gaps in the formal system, the cost of procuring, maintaining and replacing equipment, of consumables (diskettes, paper, ink, etc.), and of providing connections (subscription to an ISP and telephone costs) make this an expensive proposition. There is, therefore, great risk that such a teaching system will exclude the most disadvantaged students (children and adults) – those from rural areas, peri-urban areas and pockets of urban poverty—with the benefits limited to the more financially advantaged minority.

In addition to initiatives by the Ministry of Education, a number of projects have been undertaken by NGOs. The Group for Increasing Awareness and Learning among the People (GEEP) is working to “promote a community-based model of learning, the use and incorporation of information and communications technologies for young people” with IDRC funding as part of the Acacia program. This project consists of creating a dozen “cyber-

²⁰¹ Cheikh Thiam: Pédagogie, in *Le Soleil*, Multimedia column, May 22-23, 1999.

²⁰² UNESCO: Renforcer la technologie de l’information pour le développement en Afrique, proposition de sous-projet dans le cadre du projet “Création de réseaux de formation pour les enseignants africains”: National Senegalese Network, (doc UNESCO/CII/INF&ED/LWF-1/04/97), p. 1.

²⁰³ Ibid. p. 3.

²⁰⁴ Op. cit. p.16-21.

spaces for young people” within GEEP’s 130 clubs devoted to Family Life Education. These are to include a multimedia computer, a modem, a printer, and an inverter. What is original about this project is that rather than viewing the technology as an end in itself, it is conceived as a means of supporting and enhancing existing activities, and of improving communication within the network created by GEEP, both within Senegal and abroad. GEEP is also experimenting with peer educators, in order to facilitate incorporation of the information and communications technologies by young people, and is developing research activities to gauge the contribution of the technologies, assess its impact on scholastic performance and determine what new abilities and skills are being developed as a result of students’ involvement in the cyber-spaces for young people.²⁰⁵

9.2. Health

Senegal has been selected by the Telecommunications Development Office of the International Telecommunications Union (ITU) for an experiment in the field of telemedicine. A steering committee was created, at the initiative of *Sonatel*, including the National Physicians’ Association, the Ministry of Health, hospital directors, and those responsible for maintenance services at the hospitals involved in the project. The basic objectives of the project are to reduce maternal and infant/child mortality and morbidity, and to increase AIDS awareness and promote reproductive health. The Saint-Louis region was selected as the area to conduct the pilot project – or, more specifically, the Saint-Louis and Ndoum Hospitals. The telemedicine steering committee was subsequently incorporated in the health group, as part of the Acacia Senegal strategy, and other activities, to be carried out by the committee, were planned, such as medical screening, treatment and monitoring of epilepsy and acquired congenital heart disease, a study on the effects of cellular telephones on health, the establishment of a training and research institute dealing with methods and applications for the use of information and communications technologies in health (INFORMATICS),²⁰⁶ and the creation of an African institute of telemedicine, based at the university hospital at Fann. The project’s primary activities have been demonstration sessions, and these have confirmed the feasibility of the project. The last quarter of 1999 should see the beginning of transmission of patient files and images from regions without specialists, primarily in gynecology/obstetrics (monitoring of at-risk pregnancies), neurosurgery (head trauma and epilepsy), cardiology (screening and monitoring of cardiac pathologies) and ophthalmology (prevention of diseases that cause blindness).²⁰⁷

10. Telecenters, cyber cafes and other points of access to the Internet

Given the low standard of living, the cost of computer equipment, and the high communications costs, very few Senegalese are able to connect to the Internet from their homes. Most, therefore, connect at their place of work, whether through private telecenters, cyber cafes, academic advisory centers or through community resources, most of which are located in Dakar, though these also exist in most of the country’s secondary cities.

²⁰⁵ GEEP: Project to “promote a learning model that is community-based, and stresses the use and incorporation of information and communications technologies for young people.” Project proposal submitted to IDRC in the framework of the Acacia/Senegal strategy. Dakar, July 1998, 16 pp.

²⁰⁶ GUEYE, Mamadou: Enjeux des TIC dans le secteur de la santé. Dakar, IDRC, 1997, 3 pp.

²⁰⁷ GUEYE, Mamadou: Télémédecine. Presentation at the seminar “Les enjeux des NTIC pour le Sénégal et l’Afrique: Rôle des parlementaires,” held in Saly Portudal, August 20-22, 1999, Dakar, August 1999, 5 pp.

10.1. Private telecenters

In 1992, *Sonatel* authorized private telecenters, connected via its network.²⁰⁸ In response to the need for general public telephone access, the telecenters quickly replaced telephone booths, which, because of their relatively high installation cost²⁰⁹ and the frequent damage they sustained during political and social protests, were scarce. Initially (1992-94), *Sonatel* set precise rules for the installation of telecenters, including a minimum distance between centers – according to a model similar to the criteria for the placement of pharmacies. In 1995, however, regulations governing the opening of telecenters were eliminated²¹⁰ in the face of complains from the initial group of owners following the fierce competition that punished the sector. This change in *Sonatel*'s policy resulted primarily from the fact that a telephone line installed in a telecenter produced four times the sales revenue of a main trunk line.²¹¹ The introduction of competition has also had beneficial effects for consumers, since the unit that was previously sold at the uniform rate of 100 CFA francs dropped to between 65 and 100 CFA francs.²¹² In 1998, there were approximately 6,796 private telecenters, 137 public phones and 30 telecenters distributed as follows:

- 3,922 or 56.3% in Dakar
- 707 or 10.2 % in Thiès
- 490 or 7% in Saint-Louis
- 272 or 3.9 % in Ziguinchor
- 261 or 3.7 % in Tambacounda
- 219 or 3.1 % in Kaolack
- 128 or 1.8 % in Kolda

As indicated by these figures, more than half of the centers are in Dakar. However, there has been a definite redistribution that has benefited the rest of the country, since the previous distribution favored Dakar by a 65/35 ratio.²¹³ Furthermore, given that the distribution of ordinary telephone lines is 70/30,²¹⁴ it is clear that there is a more equal geographic distribution of telecenters than of traditional telephone lines.

The number of centers has continued to grow: in 1999, Dakar alone had 7,200,²¹⁵ while the total number for the country was close to 10,000.²¹⁶ These centers, in addition to providing telephone access, offer public access to information and communications technologies, since in addition to telephones, they often have fax service and, in some cases, office services, with

²⁰⁸ NDIAYE, Momar Ali: L'impact des technologies de l'information sur le développement économique et social, op. cit.

²⁰⁹ The investment required to install a public telephone booth is approximately 6 million CFA francs, according to ZONGO, Gaston: Impact socio-économique et financier des télécentres privés: Le cas du Sénégal, ICTP/ITU Workshop on Economic Quantification of the Impact of Telecommunications in Development, Trieste, Italy, February 26-March 1, 1996, p. 6.

²¹⁰ To open a telecenter, it is necessary to pay a fixed subscription of 250,000 CFA francs per line and to have a commercial license.

²¹¹ ZONGO, Gaston: Essai d'analyse de la faiblesse de la télédensité et de la productivité du secteur africain des télécommunications, presented in Geneva, ITU/BDT, March 19-21, 1996, <http://www.telecomplus-plus.sn/observatoire/OBanalyse.htm>

²¹² The unit is sold for 60 CFA francs (TTC) by *Sonatel*.

²¹³ Ibid. p. 8.

²¹⁴ Ibid. p. 10.

²¹⁵ DIAGNE, Anta: Eléments de diagnostic de l'entreprise et formulation d'une stratégie marketing: Le cas des télécentres. Masters thesis, School of Economic and Management Sciences, Dakar, 1999, p.12.

²¹⁶ *Jeune Afrique/L'intelligent*, No. 2046, March 28 to April 3, 2000.

approximately 1,000 equipped with computers.²¹⁷ More importantly, an increasing number of centers have modems, allowing clients to connect to the Internet, thus contributing to decentralizing, increasing and democratizing access.

10.2. Cyber cafes and other Internet access points

Since the country's first connection to the Internet, in March 1996, cyber cafes and other internet access points have flourished in various locations – predominantly in Dakar, but also in the rest of the country. In Dakar, the most visible of these are run by the two largest ISPs, Télécom-Plus and Métissacana. There are also other access points, however -- often at telecenters -- that offer a broad range of services. With no scientific study of internet access points available, the statistics that are available come from the press; thus, the figures and facts cited must be regarded with caution.

i) Métissacana Cyber Cafe

Opened July 3, 1996, Métissacana, which claims to be the first cyber café in West Africa, is in downtown Dakar and offers a number of cultural and artistic activities. It is part of a complex that includes a bar, a restaurant and an outdoor auditorium where film screenings and fashion shows are held.

Clients have, at their disposal, a room with 14 computers, which are always online, since the business is open 24 hours a day, every day of the year. A team of facilitators (made up of young people) provides assistance to novices, who are thus able to begin surfing the web, seeking advice as necessary. The operation functions as follows: The client purchases a card, which records the session's starting time and gives the client one hour at the computer for a cost of 1,500 CFA francs, or 1,000 CFA francs for an hour and a half. In addition to its cyber café, Métissacana has two full-service telecenters that are connected to the Internet via ISDN and offer a range of services from telephone and fax to office services. The clientele is quite diverse, including teenagers, students, business people, as well as foreigners residing in the country, who come to play, research information on the web or communicate via e-mail. According to an article published in July 1999 in the newspaper *Sud Quotidien*, 60,000 people have an e-mail address at Métissacana.²¹⁸ This figure, if accurate, calls for a significant upward revision in the figures customarily cited concerning the number of people on line in Senegal, which are generally based on the number of subscribers to different ISPs, not on the actual number of users.

ii) Télécom-Plus telecenters

Télécom-Plus runs three telecenters in Dakar—at the Place de l'Indépendance, on the Boulevard de la République, in downtown Dakar, and near the Université Cheikh Anta Diop de Dakar. All are equipped with computers linked to the Internet, and customers may purchase 20-minute sessions (for 750 CFA francs) as well as 1-hour sessions (for 2,250 CFA francs). Unlike Métissacana, these centers have no trained facilitators, and offer a limited range of services. Printing, for instance, is not available. Clients must save messages or documents on diskettes, which poses a problem for those without easy access to a computer elsewhere.

²¹⁷ *Sud Quotidien*, 29 July 1999.

²¹⁸ *Sud Quotidien*, July 29, 1999.

iii) Other internet access points in Dakar

In addition to the above locations, which serve the bulk of the consumers, there are minor internet access points in downtown Dakar, usually located in small service businesses.

These include the following:

- The ICE (International Communication Express) cyber café, at 76 avenue Georges Pompidou, on Dakar's "Champs Elysées," which includes fast food, a tea room, a game room, and a multiservice center offering telephone, fax, photocopying and internet access;
- *Point Net*, on the rue Thiong, a stone's throw from the Sandaga market. This business provides internet service with Net2phone, in addition to designing web pages, hosting sites, and providing on-site internet access that allows clients to send and receive e-mail;
 - The Internet center of the Forum Francophone des Affaires, on rue Moussé Diop. This center has been in operation since December 11, 1998, and was installed following a decision at the Francophone Summit, in Hanoi. It primarily targets economic agents, and it has already been involved in training 170 SMEs/SMIs.
-
- Le Cybernaute, on rue Moussé Diop, in the downtown area;
- The World Voyage cyber cafe, at 45 avenue Georges Pompidou, which functions as both a currency exchange and telecenter;
- Le Service Informatique (LSI) on rue Bayeux, in downtown Dakar. This is an information technology company;
- Communicator, at Point E, near Channel 4, not far from the Université Cheikh Anta Diop de Dakar;
- The Pyramide Culturelle Sénégalaise cyber café, on avenue Abdoulaye Fadiga, near the port;
- Cyber Business Center, at 24 Avenue Léopold Sédar Senghor, in downtown Dakar;
- The Cyber Kiosk run by the organization Yinternet.org, in Colobane, at rue 41 and rue 38, near the obelisk.

For more regular users, subscriptions are also available, providing an e-mail address, in addition to one-time internet services and, in some cases, other services. Thus, AUPELF-UREF's SYFED center provides unlimited online time, an e-mail address, and personal web page hosting, for 30,000 CFA francs per year. At Métissana cyber café, there are two options. One is based on an annual subscription fee of 125,000 CFA francs, and provides an e-mail address plus on-line time at 500 CFA francs per hour. The second is based on an annual subscription fee of 450,000 CFA francs, and provides an e-mail address and unlimited internet access. Finally, the Université Cheikh Anta Diop de Dakar provides tertiary education students an e-mail address and on-site internet access, for 1000 CFA francs per month, or 10,000 CFA francs per year.

Except for access points offered in the university environment, the clientele of these cyber cafes is composed primarily of foreign residents and travelers, individuals of some means, and young people from financially well-off families, for whom surfing the net at a cyber café is a "must." In addition to this phenomenon or fad, the resource is also being used by "average" Senegalese to communicate, with increasing frequency and at lower cost, with family members abroad, as well as by small-scale economic agents, for whom the Internet is gradually replacing the telephone and fax.

iv) Public internet access points outside Dakar

Though the majority of ISPs are in Dakar, the quality of the country's telecommunications infrastructure and the fact that *Sonatel* offers a single rate for internet access throughout the national territory has led to a proliferation of public internet access points in almost all regions. In Ziguinchor, the company *Sud-Informatique* diversified its activities in January 1997 by opening a cyber café in the commercial district of *l'escale* with two computers. It also offers word processing, telephone, and fax services. This small business, which has an office services training center, is primarily focused on developing and distributing software, doing desktop publishing, and selling and maintaining microcomputers. On September 7, 1998, Métissacana opened a cyber café with five internet access terminals at the beach resort of Saly, approximately 80 kilometers from Dakar. Here, the clientele is composed primarily of tourists and people who have come to attend seminars. Besides these two examples, there are public internet access points in most of the regional capitals (Diourbel, Fatick, Kaolack, Kolda, Louga, Saint-Louis, Tambacounda and Thiès), as well as in a number of secondary cities, such as Mbour, Podor, etc.

The development of public internet access, in Dakar as well as in the country's other main cities, shows that internet use is closely involved with the academic and research world. In cities such as Saint-Louis, Saly, Mbour and Ziguinchor, public internet access is strongly tied to tourist activity. An increasing number of businesses, merchants, NGOs, government departments, and even private individuals, are making the Internet one of their preferred means of communication. While internet users come from a wide range of geographic and social environments, it is clear that this is essentially a phenomenon of the urban elite. In the absence of systematic studies of usage, it is impossible to know the precise identity of internet users and what activities they engage in on line. However, empirical observation suggests the following uses:

- communication between parents and children studying abroad;
- online research seeking information on study abroad;
- contact between local NGOs and their partners;
- research on business opportunities;
- online documentation for professional purposes; and
- other uses.

11. Civil society and information and communications technologies

More than three years after Senegal officially connected to the Internet, a small survey of commercial and non-commercial service providers suggests that there are an estimated 8,500 subscribers to such services.²¹⁹ In addition to these users, whose access is either public or private, are users at organizations such as IRD, the former ORSTOM (230 users), the Université Gaston Berger de Saint-Louis (70), the Ecological Monitoring Center (50), *Sonatel* (166), etc., along with organizations such as USAID (100), the International Labor Office (ILO), the World Bank, the Central Bank of West African States BCEAO, etc., plus those who have free e-mail addresses through Hotmail, Yahoo and other providers, accessing them

²¹⁹ The approximate number of internet subscribers, based on information collected, in many cases, in the face of considerable reluctance on the part of service providers, is: Télécom-Plus: 4,000, Aupelf-Uref: 601, Métissacana: 1,200, Université Cheikh Anta Diop de Dakar: 1,300, Trade Point Senegal: 243, Arc informatique: 400, Cyber Business Communication: 300, Office of the Prime Minister: 200, Enda Tiers-Monde: 150 and Point Net: 20.

in cyber cafes and at other internet access points.²²⁰ Thus, the total number of people on line would be close to 11,000, out of a population of 8.6 million. Many of these users have felt the need to organize; thus, a number of groups have sprung up, including the following:

- l'Observatoire sur les Systèmes d'Information, les Réseaux et les Inforoutes au Sénégal (OSIRIS), created March 28, 1999, whose objectives are:

- 1) to contribute to the development of the information society, in accordance with, in particular, the recommendations of the African Information Society Initiative adopted by the United Nations Economic Commission for Africa;
- 2) to promote the use and incorporation of information and communications technologies;
- 3) to review all initiatives in this area and promote synergy;
- 4) to inform decision makers in different sectors, as well as citizens, of the opportunities and stakes that these technologies involve; and
- 5) to promote international cooperation in general, and subregional cooperation in particular, in the area of information and communications technologies.

- the Association of Internauts for the Promotion of Information Technology and of the Internet in Africa (ADIPIA), which was created in November 1998, and published a bimonthly journal called *Wafia*;

- the Senegal chapter of the Internet Society, ISOC-Sénégal, created on February 29, 1999, with the following objectives:

1. to promote internet use in Senegal, taking advantage of past experience, offering information initially, and promoting contacts between local members and with other ISOC members;
2. to encourage Senegalese participation in the work of ISOC;
3. to encourage participation in all types of Senegalese and international cooperative projects, both public and private;
4. to promote appropriate treatment of the country's languages on the Internet, encourage dissemination of local content, and foster cooperation with other African chapters of ISOC;
5. to make the positions of the Chapter and of the ISOC known to all individuals and corporate entities interested in the Internet;
6. to encourage, prepare for and participate in all meetings, events, conferences, working groups and commissions, formal and informal, as well to be involved in all works and publications using electronic (particularly the Internet) and non-electronic media — in accordance with its social objective; and
7. to undertake any activity that supports an environment conducive to democratizing internet access and, in general, that promotes internet use in Senegal;

- the Sen@robase Foundation for the Promotion of New Technologies in Senegal, created on May 5, 1999 with the "objective of facilitating the promotion and use of electronic networks and their development in Senegal in the most coherent manner possible and taking into full account the spirit of the country." The Foundation, in particular, aims to "encourage Senegal and the Senegalese people to play a unique and prominent role, within the field of new

²²⁰ Thus, at Métissacana, close to 3,000 individuals have internet accounts.

information and communications technologies, in the ‘global village’.” Those who constitute the driving force behind this foundation believe that “globalization can be turned into an opportunity for our country to progress rapidly toward playing an important industrial, technological and scientific role.” The Foundation aims to “provide Senegalese authorities with the highest level of expertise in all matters relating to electronic networks, new information technologies and emerging occupations.”

This dynamic for forming groups and associations is relatively old, with the Association of Microcomputer Clubs of Senegal (ACMIS) dating back to 1985. The mission of this group is to develop and popularize computerized tools and related techniques. Its heyday was in the late 1980s. Today, it faces serious problems, and its activities consist primarily of:

- organizing a software competition;
- hosting conferences, round tables, etc.;
- training its members (currently more than 1,500 members have been trained);
- organizing vacations that include an introduction to microcomputing;
- training Senegal’s top mathematics students in their penultimate year of study toward a Baccalaureate degree;
- training employees of the Office of Research and Planning (DRP/MEN), *Air Afrique* employees, instructors of educational groups, employees of the Human Resources Planning Office (DPRH) at the Ministry of Economy, Finance and Planning, etc.; and
- publishing the journal Micro-Info.

These groups have undergone a clear change in philosophy. Initially, they dealt primarily with training, whereas their orientation today relates more to increasing awareness and stimulating thought regarding the stakes involved in developing an information society at both the individual and group levels. Thus, users’ groups are involved in protesting the high cost of telecommunications -- pointing to the *Sonatel* monopoly on dedicated lines, etc. -- as well as in studying and discussing government policy, speaking out in debates on social issues, such as that of internet taxation,²²¹ etc. OSIRIS and ISOC-Sénégal are among the most active groups. The former is involved in a range of activities (awareness-building seminars, discussion sessions, etc.), has a website²²² and has, since August 1999, published a monthly electronic newsletter on current information and communications technologies in Senegal, entitled *Batik*. The local ISOC chapter organized the Senegal Internet Fair, as well as a number of training workshops dealing with network technologies. These two groups also lobby officials to create conditions for expansion of the Internet and of its applications.

In addition to these groups, a specialized press has developed. Its existence is tenuous, but serves a useful purpose. In terms of print media, only *Le Soleil* regularly publishes a multimedia column, which appears in its weekend edition. Other dailies, such as *Sud Quotidien* and *Walfadjri*, have also experimented with such undertakings, but without long-lasting results. Other than these supplements published by the daily press, there are initiatives such as the magazine *Tendances Informatiques*, a monthly specializing in computer technology and multimedia. *Radio Télévision Sénégalaise (RTS)* broadcasts a program hosted by Amadou Lamine Ba, entitled “La parole aux internautes” (“Internauts Speak”). Lastly,

²²¹ Cf. the Oasis article published in the Multimedia column of the newspaper *Le Soleil* on July 21, 1999, entitled “Taxer le trafic sur Internet pour favoriser son développement dans les pays sous-développés: une mauvaise réponse à un véritable problème.”

²²² The address of this site is <http://www.osiris.sn>

Mamadou Ndiéguène began a monthly broadcast in 1999, entitled SET, for “Science, Environment and Technology.”

12. The impact of new technologies on changing social relations

Given the small number of Senegalese exposed to information and communications technologies, and the lack of research in this area, it is difficult to measure the impact on social relations. However, it is clear that the media, and television in particular, play an important role in promoting new models, new values, and new behaviors. The proliferation of privately owned radio stations has also created a freedom of speech previously nonexistent on the public airwaves. Subjects that formerly were taboo, such as couples relationships, relations between co-spouses in polygamous households, concubinage, abortion, etc., are now regularly discussed. Even more important, these stations give ample space to the country’s native languages, opening up the airwaves to a section of the population that was previously without a voice.

Nevertheless, women, who constitute 52% of the population (and as much as 60% in rural areas), are largely excluded from access to information and communications technologies, as indicated in a study conducted by IDRC.²²³ Because of this, IDRC and Enda have begun projects designed to remedy this inequality. Within the Acadia initiative, IDRC has begun a research program on “gender and ICTs,” in order to identify the causes and mechanisms of exclusion, and propose strategies to reverse this sharp trend. Enda directs a program entitled “Infohighways to the world of women in Francophone Africa,” which hopes to increase the incorporation of information and communications technologies by women, as well as their participation in producing content, while strengthening their capacities for communication and cooperative action.²²⁴

Young people, under the age of 20, who represent 58% of the population, are also largely excluded from using these technologies. However, initiatives designed to expose them to the technologies are proliferating. In addition to the World Bank’s WorLD Links program and GEEP’s “young people’s cyber-space” program in the schools, work is being carried out by the association Yinternet.org Sénégal.²²⁵ As a member of the international Yinternet.org network,²²⁶ the organization’s objective is to “encourage young people to cooperate via the Internet, and increase their awareness of the appropriate use of new information and communications technologies for lasting development.” Enjoying the support of a number of funders, with Swiss cooperation a predominant component, Yinternet.org offers various training programs (introduction to computers, introduction to the Internet, training of multimedia mediators, etc.), provides information services (“Internet handbook for young people in Senegal,” with a listing of the best websites for young people, and Sen Info Web, a paid information service for businesses). It also has a center called the Cyber Kiosk, which is staffed by young people and has dozens of computers connected to the Internet, which can be used at preferential rates by members of youth groups and NGOs.

13. Immigration and information and communications technologies

²²³ NIANG, Oumoul Khayri; SEYE-SYLLA, Fatoumata: Les femmes et les TIC: situation actuelle, besoin et perspectives d’action, IDRC, Dakar, April 1999, p. 16.

²²⁴ ENDA: Inforoutes au féminin en Afrique francophone. Enda, Dakar, 1999, 5 pp.

²²⁵ The y in *Yinternet.org* is an allusion to the English word “youth.”

²²⁶ Cf. <http://www.yinternet.org>

Though there has not been specific study of this area, it should be emphasized that ICTs have long been used by émigrés. This sector has a high proportion of people who are illiterate, and has often used digital technology in unconventional ways. Thus, a machine such as a tape recorder, ordinarily used for professional and leisure purposes, becomes a means of communication with family members in the home country. This community, for whom communication with home is a central issue, quickly understood the benefits that might be gained from a technology that eliminates intermediaries needed for writing messages and reading them, thus simplifying the communication process and restoring to it the element of privacy. At a certain point, tape recorders and video cassettes began to be used for this purpose, having the advantage of providing a living sound or image to those receiving the message. Today, internet developments have led some émigrés to use internet telephony with Net2Phone and other similar kits, in order to keep in more frequent contact with family members at lower cost, while literate émigrés are using e-mail.

Research Prospects

As has been shown throughout this account, there are a number of important issues that have not yet been documented. In the UNRISD research project on the impact of ICTs on the country's economic and social development, a number of questions deserve study. These may be categorized as follows:

- History of a success story: *Sonatel*

While the vast majority of publicly owned companies, as a result of poor management and lack of profitability, have been either liquidated or privatized, *Sonatel* is a rare exception. The reasons for the success of *Sonatel*, which has been well managed -- providing quality infrastructure and service, with high profits that have allowed it to invest while maintaining a relatively low level of debt -- are worthy of study. In addition to *Sonatel* itself, telecommunications sector policy should also be examined, since such policy represents, so to speak, a tree of success masking a forest of failures -- of which the New Agricultural Policy (NPA) and the New Industrial Policy (NPI) are two examples.

- In-depth analysis of users and use of ICTs in general, with particular focus on internet users.

Senegal has been connected to the Internet for almost four years, and now has between 8,000 and 9,000 individuals on line. However, a lack of scientific studies on the subject makes it impossible to provide a reliable, fact-based analysis or a comparative analysis with other countries, as well as to provide accurate answers to a range of questions. Thus, an analysis of users and usage should determine, among other questions: the sex, age, profession, income level, educational level, nationality, geographical location, etc., of those who are on line; the reasons people are using the Internet (professional purposes, personal reasons, entertainment, etc.); whether they are using the Internet for e-mail, chat rooms, etc.; how often they are on line, and for how long; how much they spend on internet connection; location at which people connect (office, home, cyber cafes, etc.).

- Use of ICTs in the informal sector

ICTs are being used more than might be expected by the informal sector, which is a strong user of telephones, fax, cellular telephones and, increasingly, the Internet. It would be

instructive to have answers to a number of questions, including: why and how this sector incorporates these technologies; the level, and the particular type of use; and whether this usage contributes to bridging the gap between the informal and formal sectors, or rather serves to perpetuate the exclusion of the informal sector from the formal economic system.

- Information and communications technologies and émigrés

There has also been an increase in use of ICTs by émigrés, a group consisting, in large part, of people who are illiterate and, by an overwhelming majority, of people from rural areas. First the tape recorder, then the video cassette recorder, and now the Internet have been used by émigrés to communicate with their home communities, giving rise to a number of interesting questions, including: the reasons and the manner in which ICTs are used by this sector; the ways in which such use brings about changes in traditional modes of communication and in social relations in the home communities; the extent to which closer ties with home communities cuts them off from the rest of the society, in favor of the country to which the émigrés have moved; whether these technologies assist in preserving the original values and cultural models of émigrés or, rather, act as a conduit for foreign values and models; and, lastly, whether émigrés contribute to promoting ICTs.

- The evolution of telecenters: from the telephone to the Internet

In Senegal, privately owned telecenters have played a significant role in making the telephone accessible. The question, today, is to what extent, and under what conditions, will these centers play a comparable role in increasing internet access.

- ICTs: serving Government or serving the people

For some years, the Senegalese government has discussed the possibility of instituting a government intranet, in order to improve communication within the Government and reduce telephone costs. The question is whether, beyond this limited objective, in an underdeveloped country such as Senegal, these technologies can be used to serve its citizens and, if so, for what purposes and under what constraints.

- The geography of ICTs

In many developing countries, information and communications, as a rule, are centered in the cities and, particularly, in the capital, and Senegal is no exception. The comparative distribution of communications systems between urban and rural areas, and between different parts of Dakar, is a matter that should be studied, in order to determine the positive or negative correlation between demographic density and the density of different forms of information and communication. In addition, it would be instructive to examine the degree to which the Senegalese people have access to information and communications technologies, beyond what is already known from the relatively uninformative social statistics regarding, for example, the density of telephone lines or television sets.

- The illiterate population and their relation to ICTs

Empirical observation of some groups, such as the émigré community and economic agents in the informal sector, indicates that, contrary to expectations, those who are illiterate are not

necessarily excluded from using ICTs. It should be possible, through a systematic study, to clarify the way in which those who are illiterate relate to these technologies, how their use varies from traditional use of these technologies, and what products, services and interfaces should be developed to provide them the full benefit of the technologies.

- Privately owned radio stations vs. community radio stations: reasons for the difference in their pace of development

As a result of official policy in Senegal, private radio stations developed strongly, while community stations are, to a great extent, still in their infancy – a situation unlike that in countries such as Mali. The obvious question is why there is such a difference between the State's manner of dealing with private vs. community stations, and the consequences of such a policy. This, in turn, raises the question of whether there is still a viable role for community stations.

- The introduction of ICTs in the educational system: credible response to a structural crisis, or fad without a future

Given the expansion of educational demand resulting from the country's demographic explosion and the need to modernize the educational system, Senegal is attempting, for better or worse, to introduce ICTs in schools and universities. Can such technology in general, and distance learning technology in particular, provide a viable answer to the challenges? If so, under what conditions and constraints, with what benefits and drawbacks, and with what consequences for the economy and for teaching methods? The introduction of ICTs in the educational system poses numerous questions. Answering these questions is vital in order to avoid the mistakes made in introducing television in schools and avoid sacrificing a generation or more of school children to the consequences of such mistakes.

- ICTs: a door to the “global,” a break with the “local”

Many efforts have been and are being made to connect underdeveloped countries to the Internet, in order to prevent their becoming marginalized. Such projects are well-intentioned, but the question is whether they, in practice, run the risk of assisting privileged groups in under-developed countries – providing them with connections to their counterparts in developed countries -- while cutting them off from the daily realities of their country, and whether such projects run the risk of only connecting the prosperous segment of the population, which is of greatest interest to foreign markets. In order to provide answers to these questions, it would be instructive to construct a map detailing electronic relationships, indicating precisely who communicates with whom, who exchanges files and other material with whom, and, in time, who trades with whom.

- The Internet—a tool to connect the elite and isolate the masses?

Given the issues outlined above, the question arises whether the Internet is a tool which, while allowing the Southern elites (intellectuals, politicians, economic, cultural, social and military elites, etc.) to interconnect, or to connect with their counterparts in the North, simultaneously isolates them further from the mass of the illiterate, rural, impoverished population that have rarely, if ever, had access to this tool, thus making the world a global village for some, and turning it into a local village for others.

- Telecenters, or the private sector serving the public sector

In the past, the public and private sectors have often worked in opposition to each other. In Senegal, in the mid-1990s, the fact that the private sector was granted authority to market telephone service significantly increased telephone access for the population, thus fulfilling one aspect of the government's role that, traditionally, had been reserved for the public sector. Without intense investment, sophisticated design, or a "project" dynamic, telephone access and the density of telephone service increased. What factors account for this result? Can the experience be replicated in other areas, and can it serve as a model and support for the development of internet access? These questions are well worth answering.

- The development of cyber cafes and other public internet access points

Initially, the Internet was used primarily by NGOs, universities and researchers. However, public access increased rapidly, from cyber cafes such as Métissacana and Le Ponty, which combine selling drinks with internet access at multiservice access points similar to hotel business centers, generally offering telephone, fax, and office services, such as photocopying, word processing, lamination of IDs, etc. How are cyber cafes and internet access points distributed throughout different parts of Dakar and in other cities in Senegal? What sales revenue do they generate, and what is the composition of their clientele? For what purposes are they most commonly used? How are they equipped? What are the prospects for development of this sector? These are some of the issues that could be studied.

- Experiences in the collective use of ICTs, from radio to the Internet

From radio to the Internet -- by way of the telephone, television and print media -- the media have often been the object of formal or informal collective experimentation. It would be interesting to investigate the role that tradition and culture play in these collective practices, as well as the role of economic and technical constraints (illiteracy, difficulties in using the technologies, problems of access, etc.), in order to determine whether, in the particular context of Senegal and, more generally, in Africa, the collective appropriation of these technologies is a necessary or advisable step toward individual incorporation of the technologies on a broad-based basis. It would also be useful to determine how these collective practices might be used to overcome obstacles to the dissemination of these technologies -- such as the cost of procurement and/or operation -- as well as to examine the ways in which they strengthen the social fabric.

- ICTs and young people: how technology can be a tool to enhance a socially excluded group

Young people in Africa constitute a socially marginalized group, due to the primacy accorded to elders. How can the new tools of information and communications technologies help young people to emerge as a driving force in the process of bringing our countries into the information society? Do these technologies, in which expertise is often inversely proportional to age, contribute to a shift, or even a reversal, in social values? Do they, by providing a door to the larger world, while offering very little in the way of opportunity, further accentuate young people's separation from their social origins, while offering them little or no prospects? Will they widen the gap between young people, navigating in cyberspace, and adults linked with the traditional society (or with what remains of it)?

- Mobile telephony: a technology for the poor?

In slightly over two years, mobile telephony has developed in a dramatic way in Senegal, with over 50,000 lines in two years, as compared with 160,000 land lines. What explains this phenomenon, given the cost of mobile communications, which can be as much as 20 times the cost of land-based telephony? Is the success of mobile telephony simply a fad, or does it constitute a basic shift? Does it represent a threat to land-based telephone service, or is it complementary? Is mobile telephony destined to supplant land-based telephony, as is already the case in some African countries? What is the clientele for mobile telephony? What is the social and geographical distribution of this clientele? What types of use are specific to mobile telephony? How profitable are mobile telephone networks? These and other related questions are of considerable interest.

Conclusion

Although it might be expected that information and communications technologies, since they are used extensively by researchers in the social sciences, would have been a subject of study by this same group, this has not been the case. This has not always been true: in the past, extensive thought and action were directed to “adapted technologies,” particularly among NGOs. However, in the mid-1990s, when the question of internet connection for Africa generally, and for Senegal, in particular, arose, there was virtually no debate by academics, researchers, intellectuals or NGOs on the political, economic, cultural and social stakes involved. Paradoxically, this debate occurred outside of Africa, notably as part of the North-South internet discussion initiated by *Le Monde diplomatique*. Intellectuals from the northern countries have made known their views regarding the advisability or inadvisability of Africa connecting to the Internet, without bothering to first consider the opinions of those who would be affected. At the time, some emphasized the opportunities that the Internet offered, insisting that Africa, already marginalized, could not afford to deliberately exclude itself from a process often described as a new revolution – a development which, from an objective point of view, was bound to have an effect on African interests. African intellectuals, long cut off from the international scientific community, and thus lacking information, were largely unaware of the development of Arpanet, NsfNet and networks such as Earn and Bitnet. Given this isolation, when the “information superhighway” appeared in the headlines, these groups were not critical, generally regarding the development as intrinsically positive. Today, the debate concerning Africa’s relation to the Internet is largely moot, since African countries as a whole are now connected with the “network of networks.” Moreover, it can be regarded as positive that, although some predict that Africa will separate itself from the global system, no one, as far as is presently known, is actually advocating that Africa disconnect itself from the information superhighway. Given the increasing use of information and communications technologies in different sectors, an analysis of their social impact, potential or actual, is indispensable. The questions addressed in this document, as well as the research topics proposed in the last section, should serve as a pretext for Senegalese researchers, and African researchers generally, to create a foundation for endogenous research capability in this field. Furthermore, by taking advantage of this opportunity, they will contribute to ending the too-frequent division of labor, by which data, in this field, are collected in the South, but are analyzed in the North.

List of Abbreviations and Acronyms

ACCT	Agence de la Francophonie
CIDA	Canadian Agency for International Development
AFRISTEC	African biennial conference on science and technology
AOF	French West Africa
APC	Alliance for Progressive Communication
ART	Telecommunications Regulation Agency
BBC	British Broadcasting Corporation
BDT	Office of Telecommunications Development
ILO	International Labor Office
WADB	West African Development Bank
BRVM	Bourse Régionale des Valeurs Mobilières
CCIA	Chambers of Trade, Industry and Agriculture
CDMA	Code Division Multiple Access
UNECA	United Nations Economic Commission for Africa
CESTI	Center for Information Science and Technology Research
CFI	Canal France International
CICES	International Foreign Trade Center of Senegal
CID	Customs Information Center
CLAD	Applied Linguistics Center of Dakar
CNCR	National Council for Rural Coordination
CNCT	National Telecommunications Coordinating Committee
CNDST	National Center for Scientific and Technical Documentation
CNES	National Federation of Senegalese Employers
CNI	National Information Technology Committee
UNCTAD	United Nations Conference on Trade and Development
IDRC	International Development Research Center (
CRODT	Oceanographic Research Center of Dakar-Thiaroye
DAF	Office of Records
DAST	Commission on Scientific and Technical Affairs
DERPT	Directorate of Postal and Telecommunications Management and Research
DINFO	Commission for Informatics Development
DPS	Office of Forecasting and Statistics
DTAI	Office of Automatic Data Processing
DUA	Office of Urban Planning and Architecture
EBAD	The School for Archive and Documentation Librarians
EGEF	Conference on the Status of Education and Training
ENSUT	Ecole Nationale Supérieure Universitaire de Technologie
ESMT	Ecole Supérieure Multinationale des Télécommunications
ESP	Ecole Supérieure Polytechnique
FCR	France Câbles et Radio
FFA	Forum Francophone des Affaires
FIDAK	Dakar International Fair
FM	Frequency Modulation
FST	Faculté des Sciences et Techniques
GEEP	Group for Increasing Awareness and Learning among the People
GES	Senegalese Entrepreneurs Group
GptNet	Global Trade Point Network

GRCC	Discussion Group on Competitiveness and Growth
HCA	Senior Audiovisual Council
HCRT	Senior Council of Radio and Television
HDI	Human Development Index
IP	Internet Protocol
IRD	Institute of Research for Development
ISO	International Standardization Organization
ISP	Internet Service Provider
ISRA	Senegalese Agricultural Research Institute
KBPS	Kilobytes Per Second
MBPS	Megabytes Per Second
MEN	Ministry of Education
MMDS	Multipoint Multichannel Distribution System
NIC	National Internet Center
WTO	World Trade Organization
NGO	Nongovernmental organization
OPCE	Office des Postes et de la Caisse d'Epargne
OPT	Directorate of Posts and Telecommunications
ORSTOM	Institute of Research for Development
ORTS	Office of Radio and Television Broadcasting of Senegal
OSIRIS	Observatoire sur les Systèmes d'Information, les Réseaux et les Inforoutes au Sénégal
PAO	Publication Assistée par Ordinateur
PDEF	Ten Year Education and Training Plan
GDP	Gross Domestic Product
IIP	Intergovernmental Informatics Program
PIISE	Project to Introduce Information Technology in the Educational System
SMEs/SMIs	Small and medium-sized enterprises/Small and medium-sized industries
GNP	Gross National Product
UNDP	United Nations Development Programme
PS	Socialist Party
RACV	Government Voice and Data Transmission Network
RFI	Radio France Internationale
RINAF	Regional Informatics Network for Africa
RIO	Intertropical Computer Network
ISDN	Integrated Digital Services Network
RTC	Public Switched Telephone Network
RTS	Radio Télévision Sénégalaise
SIID	Integrated Decision-making System
SINEC	Salon international de l'informatique, de l'électronique et de la communication
SONATEL	Société Nationale des Télécommunications
SYFED	Système Francophone d'Édition et de Diffusion
ICTs	Information and Communications Technologies
TSF	Wireless Telegraph
TSS	Télévision Scolaire du Sénégal
VAT	Value Added Tax
WAEMU	West African Economic and Monetary Union
UFR	l'Unité de Formation et de Recherche
ITU	International Telecommunications Union
UNTPDC	United Nations Trade Point Development Center
UPS	Union Progressiste Sénégalaise

URID Unités Régionales d'Information pour le Développement
WorLD World Links for Development

Bibliography

AMIN, Samir: De l'outil à l'usage: les batailles pour le contrôle des autoroutes de l'information, (Excerpts from "A propos de l'idéologie dominante de notre époque. La communication comme idéologie." presented at the meeting « L'Afrique et les Nouvelles Technologies de l'Information », Geneva, October 17-18, 1996), Internet au Sud, <http://diderot.rio.net/enjeux/amin.htm>

APECSY : Système d'Information Urbain Populaire (SIUP) de Yoff, Power Point Presentation at the 2^e Forum des acteurs de la stratégie Acacia Sénégal, Dakar, December 1998, 13 p.

BANCOULI, Yapi J.: Les entraves au développement d'Internet en Afrique: Point de vue des télécommunications, Rinaf 98, Dakar, October 16, 1998, 9 p.

BREDA/UNESCO: Report of the workshop "Création de réseaux de formation pour les enseignants au Sénégal", BREDA/UNESCO July 9-10, 1998, Dakar, 12 p.

CASTELLS, Manuel: The rise of the network society, vol. 1: The information age: economy, society and culture, Oxford, Blackwell Publishers, 1996, 533 p.

CHENEAU-LOQUAY, Annie: Quelle insertion de l'Afrique dans les réseaux mondiaux ? Une approche cartographique, (second version, updated February 1999), Internet au Sud, <http://diderot.rio.net/enjeux/loquay/default.htm>

CHENEAU-LOQUAY, Annie; DIOUF Pape: Comment développer les usages des nouvelles technologies de l'information et de la communication pour les besoins de l'échange? (Report of an exploratory mission to Senegal from April 10-24, 1998), Internet au Sud, <http://diderot.rio.net/enjeux/anusages/annusages.htm>

COCHRANE, Jeffrey A.; BUNNER Jake: Africa and the Internet Superhighway Cheikpoints p. 373-384, in VEIT Peter: Africa's valuable assets: a reader in natural resources management, World Resource Institute, 1998.

Délégation à l'Informatique. Ministère de la Modernisation et de la Technologie: Plan stratégique de développement de l'informatique au Sénégal, Dakar, 1994, 49 p.

Délégation à l'Informatique. Ministère de la Recherche Scientifique et de la Technologie: Activities report 1996, Dakar, 1997, 15 p.

Délégation à l'Informatique. Ministère de la Recherche Scientifique et de la Technologie: Journées nationales de réflexion sur la recherche scientifique pour le développement. Thème: Renforcement des capacités nationales en matière d'utilisation des nouvelles technologies de l'information et de la communication (TIC) et de valorisation de l'information scientifique et technique au service du développement, Dakar, April 1998, 28 p.

Délégation à l'Informatique. Ministère de la Recherche Scientifique et de la Technologie: Plan d'actions suite aux directives relatives à l'informatique et aux nouvelles technologies de l'information et de la communication, Dakar, 1998, 18 p. + annexes.

DENIS, Jean-Pierre; SAGNA, Olivier: *l'Afrique à l'heure des inforoutes*, in Universités, March 1997, Vol. 18, No. 1, p. 30-32.

DIA, Saidou: De la TSF coloniale à l'ORTS: Evolution de la place et du rôle de la radiodiffusion au Sénégal (1911-1986), Graduate thesis, Université Bordeaux III, 1987, 2 volumes, 660 p.

DIAGNE, Anta: Eléments de diagnostic de l'entreprise et formulation d'une stratégie marketing: Le cas des télécentres. Mémoire de maîtrise, Faculté des Sciences Economiques et de Gestion, Dakar, 1999, 42 p. + annexes.

DIAGNE, Pathé: La Sonatel et les autoroutes de l'information. Working paper, USAID, circa 1997, 5 p.

DIAGNE, Pathé: Le Sénégal à la croisée des chemins: Scénario de transition vers le 21^{ème} siècle. Working paper, USAID, circa 1997, 15 p.

DIEYE, Alioune Badara: L'engouement FM des dakarois: Les exemples de Sud FM, Dunya et Nostalgie, Grande enquête de fin d'études, CESTI, 1995, 47 p.

Direction des Relations Economiques Extérieures: Le secteur informatique au Sénégal. Dakar, June 1999, 51 p.

ENDA: Inforoutes au féminin en Afrique francophone. Enda, Dakar, 1999, 5 p.

ESMT; Globenet; Fondation du Devenir: Les Nouvelles Technologies de l'Information de la Communication dans l'administration sénégalaise. Dakar, October 1999, 31 p.

FAYE, Ambroise; MBAYE Marx Magamaou: Note de synthèse sur les technologies de l'information et de la communication au Sénégal pour l'atelier préparatoire pour l'Afrique de l'Ouest à la conférence des ministres francophones chargés des inforoutes. Dakar, October 1996, 16 p.

FIAS: Sénégal: Le parcours de l'investisseur. Foreign Investment Advisory Service, Washington DC, 1999, 94 p. + Annexes.

Fondation Rurale de l'Afrique de l'Ouest: Système d'Information et de Communication Communautaire (SIC), Power Point Presentation at the 2^e Forum des acteurs de la stratégie Acacia Sénégal, December 1998, Dakar, 14 p.

Fondation Trade Point Sénégal: Pôle de commerce électronique du Sénégal, Dakar, April 1999, 18 p.

GADIO, Cheikh Tidiane: Institutional reforms of telecommunications in Senegal, Mali and Ghana: The interplay of structural adjustment and international policy diffusion. Ph. D., Ohio State University, 1995.

GARRICK, Thomas Adolphe: Technologies de l'Information et de la Communication dans la résolution des problèmes de l'éducation et de la formation au Sénégal: Etat des lieux, pistes d'actions et de recherches, IDRC, Dakar, 1997, 71 p.

GEEP: Projet «promotion d'un modèle communautaire d'apprentissage, d'utilisation et d'appropriation des technologies de l'information et de la communication par les jeunes». Project proposal submitted to IDRC in the context of the Acacia/Senegal. Dakar, July 1998, 16 p.

Government of Senegal: Déclaration de politique de développement des télécommunications sénégalaises (1996-2000), Dakar, March 1996, 5 p.

GUEYE, Mamadou: Télémédecine. Presentation at the seminar « Les enjeux des NTIC pour le Sénégal et l'Afrique: Rôle des parlementaires » organized at Saly Portudal from August 20-22, 1999, Dakar, August 1999, 5 p.

GUEYE, Mamadou: Enjeux des TIC dans le secteur de la santé. Dakar, IDRC, 1997, 3 p.

HAIDARA, Abdoul Wahab: L'introduction de la SONATEL à la Bourse Régionale des Valeurs Mobilières (BRVM). Masters thesis, Faculté des Sciences Economiques et de Gestion, Dakar, 1999, 31 p. + annexes.

HAMELINK, Cees J.: New information and communication technologies, social development and social change. Discussion paper 86, UNRISD, Geneva, June 1997, 38 p.

HANNE, Libasse: Le phénomène Internet au Sénégal.- Dakar, ÉBAD, 1997, 116 p. + annexes.

Information and Communication Technologies: Visions and Realities edited by William H. Dutton, Oxford University Press, 1996, 304 p.

Economic Development Institute of the World Bank: World Network for Development: WorLD Program, World Bank, Washington, 1996, 18 p.

Panos Institute: Procès verbal de la réunion de validation du Réseau d'information Internet sur la décentralisation et le développement local (RESIDEL), Dakar, May 21, 1999, 10 p.

Panos Institute: Textes juridiques sur la communication au Sénégal. Panos Institute, Dakar, May 1998, 78 p.

Panos Institute: Cahier des charges et convention applicables aux radios communautaires au Sénégal. Panos Institute, Dakar, March 1998, 15 p.

Panos Institute; West African Journalists Union: Le pluralisme radiophonique en Afrique de l'Ouest. Volume 1, L'Harmattan, Paris, 1993, 163 p.

International Telecommunication Union: Challenges to the Network, Internet for Development, Executive summary, Geneva, February 1999, 18 p.

Ministère de la Communication: La stratégie du Sénégal face aux autoroutes de l'information, Dakar, 1997, 16 p.

Ministère de la Communication; Ministère de l'Economie des Finances et du Plan: Déclaration de politique de développement des télécommunications sénégalaises (1996-2000), Dakar, March 1996, 5 p.

Ministère de l'Economie des Finances et du Plan. Direction de la Planification: Plan pour le développement économique et social 1996-2001 (IX^e plan) compétitivité et développement humain durable. Dakar, February 1997, 177 p.

Ministère de l'Economie des Finances et du Plan. Direction de la Planification: Programme national de lutte contre la pauvreté: Stratégies et éléments de programme d'actions. Dakar, April 1997, 57 p + annexes.

Ministère de l'Education Nationale: Programme Décennal de l'Education et de la Formation, Document de politique sectorielle sur l'utilisation des nouvelles technologies de l'information et de la communication, Dakar, February 1998, 22 p.

Ministère de l'Energie, des Mines et de l'Industrie: Etat des lieux des téléservices au Sénégal. Document introductif au Conseil Inter Ministériel sur les téléservices, Dakar, July 1999, 57 p.

Ministère du Plan et de la Coopération: Etude prospective « Sénégal 2015 », Dakar, June 1989, 150 p.

NDIAYE, Momar Ali: L'impact des technologies de l'information sur le développement économique et social, ICT High Level Working Group of the CEA for the development of the AISI, 1996, <http://www.idsc.gov.eg/aai/senfst.htm>.

NIANG, Oumoul Khayri; SEYE-SYLLA, Fatoumata: Etude sur les "Les femmes et les TIC: situation actuelle, besoin et perspectives d'action", IDRC, Dakar, April 1999, 44 p.

National Startup Resource Center: How to establish domain, <http://www.nsrc.org/>

OASIS: Taxer le trafic sur Internet pour favoriser son développement dans les pays sous-développés: une mauvaise réponse à un véritable problème, Cahier multimédia du Soleil, 21 July 1999.

Présidence de la République. Comité national informatique: Rapport de travail: Bilan et perspectives, Dakar, meeting of November 12, 1997, 56 p.

Primature. République du Sénégal: Compte rendu de la réunion du conseil interministériel consacré aux téléservices, Dakar, July 16, 1999, 4 p.

SAGNA, Olivier: *Les inforoutes et la promotion des travaux de la communauté scientifique sénégalaise*, à paraître in Annales de la Faculté des Lettres et Sciences Humaines.

SAGNA, Olivier: Bref aperçu sur l'utilisation des TIC au Sénégal, remarks presented at the seminar "Les NTIC au Sénégal" organized by Osiris July 17-18, 1999 at Saly Portudal, Dakar, 1999, 14 p.

SAGNA, Olivier: Rapport général du Forum de concertation des acteurs de la Stratégie ACACIA Sénégal organized December 17-18, 1997 in Dakar, IDRC, Dakar, December 1997, 20 p.

SAGNA, Olivier: Les initiatives de la coopération internationale en matière de technologies de l'information et de la communication au Sénégal, IDRC, Dakar, December 1997, 48 p.

SAGNA, Olivier: Internet et les médias africains, Dakar, June 1997, p. (Étude coordonnée pour le compte de l'Agence de Presse Panafricaine (Pana) et de l'Institut Panos).

SAGNA, Olivier: *Le rôle des inforoutes dans le rééquilibrage des échanges d'informations Nord-Sud*, in Argus, spring-summer 1997, Volume 26, No. 1, p. 11-20.

SAGNA, Olivier: *Les réseaux TCP/IP en Afrique: Intérêt, enjeux et espoirs*, in Quarterly Bulletin of the International Association of Agricultural Information Specialists, 1996, Vol. 41, No. 2, p. 166-172.

SAGNA, Olivier: *Nouvelles technologies, nouveaux métiers, nouvelles formations*, in l'Ecluse, Bulletin d'Information de la Banque d'Internationale d'Information sur les Etats Francophones, 1st Quarter 1996, Volume 8, No. 1, p. 13-14.

SAGNA, Olivier: *La communication de l'IST à l'Université Cheikh Anta Diop de Dakar: situation actuelle et perspectives*, in La communication de l'IST dans l'enseignement supérieur et la recherche: L'effet Renater/Internet, Actes du colloque des 16, 17 et 18 mars 1995, Bordeaux (France). Paris, ADBS Editions, 1995, p. 69-79.

SAGNA, Olivier; DENIS, Jean-Pierre: *l'Afrique, les inforoutes et la francophonie*, in Documentaliste-Sciences de l'information, May-June 1996, Vol. 33, No. 3, p. 142-148.

SAGNA, Olivier: Rapport général du Forum de concertation des acteurs de la Stratégie Acacia-Sénégal organized December 17 and 18, 1997 at the Hôtel Téranga (Dakar), IDRC, Dakar, December, 23 p.

SAGNA, Olivier; Sow Fatoumata: Stratégie ACACIA Sénégal: General report of the workshop organized at Saly Portudal from January 8 to 10, 1997, IDRC, Dakar, January 1997, 30p.

SAGNA, Olivier; SOW Fatoumata: Étude préliminaire à l'élaboration de la stratégie ACACIA Sénégal, IDRC, Dakar, December 1996, 48 p.

SALL, Hamidou Nacuzon: Papa, je ne veux pas aller à leur école ! Remarks presented at Afristech '97, Dakar, 1997, 6 p.

SECK, Mactar: Infrastructures et politiques, remarks presented at the seminar "Les NTIC au Sénégal" organized by Osiris July 17-18, 1999 at Saly Portudal, Dakar, 1999, 28 p.

SECK, Mouhamed Tidiane: Insertion d'Internet dans les milieux de la recherche scientifique en Afrique de l'Ouest, Internet au Sud, <http://diderot.rio.net/enjeux/seck.htm>

SY, Jacques Habib: Partnerships in higher éducation in Africa: communications implications beyond the 2000s, in Démocraties africaines, No. 13 January-February-March 1998, p. 60-74.

SY, Jacques Habib: Telecommunications dependency: the African Saga (1850-1980), Alternative Communications Inc., Dakar, 1996, 227 p. + bibliogr.

Système des Nations Unies au Sénégal: Evaluation commune de la situation du pays. August 1998, Dakar, 148 p.

Télécom-Plus, Technopole Canada, Sofeg Canada: Développement du secteur des téléservices au Sénégal: Proposition et politique, sl. October 1999, 41 p.

Télécom-Plus, Technopole Canada, Sofeg Canada: Développement du secteur des téléservices au Sénégal: Annexe: L'environnement des téléservices au Sénégal , sl. October 1999, 81 p.

Télécom-Plus, Technopole Canada, Sofeg Canada: Développement du secteur des téléservices au Sénégal: Les téléservices dans le monde, sl. October 1999, 50 p. + annexes.

TOP, Amadou: Les métiers émergents, remarks presented at the seminar "Les NTIC au Sénégal" organized by Osiris July 17-18, 1999 at Saly Portudal, Dakar, 1999, 11 p.

TOURE, Pape Gorgui: Stratégie Acacia au Sénégal, IDRC, Dakar, January 1997, 61 p.

UNCTAD. Coordinated African Programme of Assistance on Services, Annex 3 Findings on Senegal, 1995, 19 p.

UNDP: Monitoring human development: Enlarging people's choices... UNDP, Washington, 1999, 262 p.

UNESCO: Renforcer la technologie de l'information pour le développement en Afrique, proposition de sous-projet dans le cadre du projet "Création de réseaux de formation pour les enseignants africains": Réseau national sénégalais, (doc UNESCO/CII/INF&ED/LWF-1/04/97), 11 p.

Union Internationale des Télécommunications: Etude de cas sur l'évolution de l'environnement international des télécommunications: Sénégal, ICEA, Paris, February 1998, 57 p.

Union Internationale des Télécommunications: Indicateurs des télécommunications africaines 1998. International Telecommunications Union (ITU), Geneva, May 1998, 139 p.

WILSON III, Ernest J.: Advanced IT Markets in Backward countries: Where do they come from, CIDCM Working Research Paper Series, Telematics for Development Program, University of Maryland , College Park, September 1998, 40 p.

WILSON III, Ernest J.: Wiring the African Economy, CIDCM Working Research Paper Series, Telematics for Development Program, University of Maryland , College Park, August 1998, 14 p.

WORLD BANK: World Development Report 1999/2000, World Bank, Washington, 1999.

ZONGO, Gaston: Les contraintes technologiques, financières et réglementaires, communication présentée au séminaire régional organisé par la Pana et l'Institut Panos, Internet: une chance pour les médias africains et la démocratie, Dakar, July 1997, 23 p.

ZONGO, Gaston: Essai d'analyse de la faiblesse de la télédensité et de la productivité du secteur africain des télécommunications, remarks presented in Genève, ITU/BDT, March 19-21, 1996, <http://www.telecomplus-plus.sn/observatoire/OBanalyse.htm>

ZONGO, Gaston: Impact socio-économique et financier des télécentres privés: Le cas du Sénégal, ICTP/ITU Workshop on Economic Quantification of the Impact of Telecommunications in Development, Trieste, Italy, February 26-March 1, 1996, 17 p.