

Telecommunications in
Nepal

by Jiajia Zheng

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Columbia Institute for Tele-Information
Graduate School of Business
Columbia University
809 Uris Hall
New York, NY 10027
(212)854-4222

Chapter VII

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Jiajia Zheng

7.1 Introduction

Nepal is a sovereign independent kingdom located in central Asia on the southern slopes of the Himalaya Mountains, the formidable range of eternal snows. This landlocked country with 147,181 sq.km. (56,136 sq.mi.) is bordered by India on the east, west, and south and by the Tibetan region of the People's Republic of China on the north. The country is divided into three topographical regions: the humid, subtropical Tarai region in the south is flat and fertile--(152 mi. above sea level)--and makes up 17% of the country; the remaining 83% consists of the Mountain region in the center, encompassing the lower Himalayas and swiftly flowing mountain rivers--more than 8,839 mi. above sea level--and the arctic Himalayan region the high Himalayas in the north. Politically, Nepal today is divided into 5 development regions, comprising 14 zones and 75 districts of 9 *ilakas* each. an *ilaka* consists of 1 or more village communities called *panchayats* --assemblies made up of the representatives of local associations. In all, the 4,015 panchayats comprise a total of 585 provinces.

Modern Nepal was created in the later half of the 18th century when Prithvi Narayan Shah, the ruler of the small principality of Gorkha, formed a unified country from a number of independent hill states. After 1800, the heirs of Prithvi Narayan Shah proved unable to maintain firm political control over Nepal. A period of internal turmoil followed, heightened by Nepal's defeat in a war with the British from 1814 to 1816. Stability was restored after 1846 when the Rana family gained power, entrenched itself through hereditary prime ministers, and reduced the monarch to a figurehead. The Rana regime, a tightly centralized autocracy, pursued a policy of isolating Nepal from external influences. Nepal was never colonized, even during the colonial era. Nepal maintained its national independence, but its policy also impeded the country's economic development.

In 1950, King Tribhuvan, a direct descendant of Prithvi Narayan Shah, fled his "palace prison" to newly independent India, touching off an armed revolt against the Rana administration. This allowed the return of the Shah family to power and, eventually, the appointment of a non-Rana as prime minister. A limited constitutional monarch was established in 1951. During most of the 1950s, the government was controlled by the monarchy, first under Tribhuvan and then, after his death in 1955, under his son, Mahendra. In early 1959, King

Mahendra promulgated Nepal's first constitution, providing for a bicameral parliament. Shortly thereafter, the first democratic elections were held for the national assembly. Less than 18 months later, however, King Mahendra declared the experiment in parliamentary democracy a failure, dismissed the Koirala government, dissolved Parliament, suspended the constitution, and again ruled directly from the palace. In December 1962, the King promulgated a new constitution, reasserting royal power and providing for a "partyless" system of government, based on the panchayat (village council), with a prime minister appointed by the king. In January 1972, King Mahendra died and was succeeded by his 27-year-old son, King Birendra. In the spring of 1979, student demonstrations and antiregime activities led to a call by King Birendra for a national referendum to decide on the nature of Nepal's government--either the continuation of the panchayat system or the establishment of a multiparty system. In the referendum, held in May 1980, 54.8% of the voters supported the panchayat system with reforms. As a result, in December 1980 the Government issued a decree amending the constitution. An agitation led by the Nepal Congress Party and the United Left Front (a coalition of seven communist parties), which culminated in strikes in the major cities of Nepal during February and March led to democratic reforms in April 1990. The king dissolved the

panchayat system, lifted the ban on all political parties, and removed all references to the "partyless" structure from the constitution. The first democratic election in three decades was held on May 12, 1991 and marked the end of a monarchy. The economic development policy of Nepal's first democratic government is easing state controls in an effort to increase private participation in the impoverished economy.

Nepal has traditionally been very dependent on India, but in August 1976 the Trade and Transit Treaty between the two countries expired. In March 1978 this agreement was replaced by two treaties (renewed in 1983 and 1984) allowing Nepal to develop trade with other countries. In June 1987 Nepal and India signed an agreement to establish a joint commission for the promotion of economic co-operation between the two countries, but in March 1989 the trade and transit agreements regulating commerce between the two countries lapsed and India did not renew them. In June 1990, Nepal and India agreed to restore relations to what they were prior to April 1987.

Nepal formally established relations with China in 1955. Since then their bilateral relations have generally been very good, and the Chinese have contributed large amounts of economic assistance to their smaller neighbor. The previous Nepal government's decision to purchase arms and armored personnel

carriers led to a trade dispute with India that has since been resolved.

Although much of the country is heavily forested and too steep for cultivation, about 91% of the labor force were engaged in agriculture, forestry, and fishing² in 1981 for lack of other options. Agricultural settlements are mostly confined to the Tarai plane in the south, leading to a small exportable surplus of foodstuffs.

Nepal ranks among the poorest countries in the world, partly due to its inhospitable terrain, of isolated valleys and towering mountains. Since the mid-1960s, the country's economic growth has barely kept pace with the increase in its population. In 1993, Nepal's gross national product (GNP) per capita was \$200, which was among the 12 lowest in the world.³ Between 1965 and 1985, it was estimated, the country's GNP per head increased, in real terms, at an average rate of 0.1% per year. The average annual growth of overall gross domestic product (GDP) was 2.3% in 1965-1980, rising to 3.4% in 1980-1985. (Shah, 1988)

The population of Nepal is growing much more rapidly, however. Estimated at 9,500,000 in 1961, it almost doubled in the next 15 years, to 17,632,960 by 1987, and is expected to reach between 20 and 22 million by the turn of the century. Overpopulation is already straining the "carrying capacity" of the middle hill areas, and population pressure on natural resources will

inevitably increase.

7.2 Telecommunications Development

The isolation that the Rana family imposed on Nepal until its ouster in 1951 meant that when the nation entered the modern era at mid-century it had virtually no schools, hospitals, roads, industry, civil service, telecommunications or electric power. The lack of transport and telecommunications facilities in particular has contributed to the country's slow rate of economic growth. Both are extremely important for Nepal's given its severe climate and rugged terrain. Yet until 1947, when the first airplane flew into Kathmandu, the only access to the Kathmandu Valley was by foot. In 1955 the first motorable road, the Tribhuvan Rajpath, was completed between India and Kathmandu.⁴ Except for the area around the capital of Kathmandu, however, access to most of the country is still difficult; twenty-five of the seventy-five administrative districts have no roads navigable by motorized transportation.⁵ Transport development has been hampered by scarcity of capital, shortage of technicians and proper equipment, and above all, topographical difficulties--all factors that have also retarded the development of Nepal's telecommunication infrastructure. Realizing the important role telecommunication plays in socio-economic development,

however, Nepal has invested and is still investing heavily in both sectors.

Telecommunications Development began in earnest in 1975, with the establishment of Nepal Telecommunications Corporation (NTC) and since then the country has continued to allocate a large share of its resources to installing and expanding its telecommunications networks.

Both transport and communications have also received considerable emphasis in public policy statements. As of 1992, Nepal has completed seven five-year economic development plans and although agriculture was given top priority, transport and communication received the highest share of total government expenditures in the first four of seven five-year plans, varying between 35 and 50 percent. It is evident that prior to the fifth plan and sixth plan, resource allocations were skewed rather heavily toward transport and communication, which still received 23 percent of total expenditures. (Shrestha & Mathas, 1990). According to International Telecommunication Union (ITU) statistics, in 1982 the national investment in telecommunication services (which include expenditure on initial installations and on additions to existing installations where the usage is expected to be over an extended period of time) was Rs. 27 million (US\$1 = Rs. 14.3 in 1982), which reached Rs. 608.8 million in 1985. Total current expenditure for all telecommunication services per year

[current expenditure means expenditure other than investments, and refers to the running of telecommunication services on an annual basis and comprises like salaries of operation staff, cost of material for operation and maintenance] increased from Rs. 49.3 million in 1982 to Rs. 214.7 million in 1987.⁶ Total staff in telecommunications services (including both operating staff and technical staff) increased from 2,106 in 1982 to 3,585 in 1993.⁷

Nepal has consistently encouraged foreign aid donor countries to invest in the area of telecommunications. In November 1982, the country's first satellite earth station was built in Sagarmatha, near Kathmandu, with British help. Nepal is a signatory to INTELSAT.

7.3 Radio and Television

In 1960, there were only about 12,000 receiving sets and 50 public listening centers in Nepal. Receiving sets increased to 60,000 in 1971, 340,000 in 1981, and an estimated 2,000,000 radio receivers in 1986.⁸ Broadcasts are on short and medium wave, and transmissions are in Nepal, Hindi, Newari, and English.

Nepal's first television station began broadcasting within the Kathmandu Valley. At that time there were an estimated 27,000 television receivers, including 25,000 color receivers in use. NTC transmits both radio and television

programs, and its radio and television studio are linked with the Sagarmatha Satellite Earth Station by a microwave system. The corporation broadcast 597 minutes of TV programming in 1990 and received programs totaling 28,868 minutes.

7.4 Telegraph

Space Time Network Pvt. Ltd., the Business Group of India Co. Ltd. & Sangrela Channel Pvt. Ltd.. Although the Nepal Television Co., had maintained a monopoly of television since the inception of television in Nepal in January 1994, the government licensed three private companies to offer satellite based television services. In October 1994, the Space Time Network became the Nepal's first Cable Network offering subscribers access to satellite TV channels--such as StarTV and other international services. By 1995, this network had 1000 subscribers. Nepal's government hopes that its liberalization of the satellite broadcast industry will spur investment in this sector and make Nepal a hub for satellite uplink services in the region. Nepal has traditionally been very dependent on India, which until 1964 controlled its external telegraph and postal services. In 1964, however, Nepal began handling its own external telegraph and postal services by mutual agreement. Before the satellite earth station was built

in 1982, Nepal had telegraph links with India and Pakistan only. Now international telegraph service is available to all parts of the world via satellite and microwave circuits, and it has direct telegraph connections with India and Japan.

Domestic telegraph service is the basic means of communication in remote areas of Nepal and plays an important role in the day to day administrative work of the government. National paid telegraph increased from 229,410 in 1982 to 1,134,346 in 1987.⁹ [9] Telegrams are transmitted by high frequency wireless communication in 20 of Nepal's 75 districts; in the other 55, voice circuits and telegraph circuits are used instead.

7.5 Telephone

Nepal's telephone network was established during the early 1970s , but by 1978 there were only 9,100 telephones for a population of 13.5 million.¹⁰ In the early 1980s, the country's trunk lines consisted of a wireless system connecting major cities such as Kathmandu and Pokhara. Private telephone lines did not exist in more remote areas, however (Masatomi, 1989) Instead, the central towns of individual districts were allotted around two hours of shortwave radio communication time per day.

The country's telecommunication network has expanded rapidly during the past 15 years. The number of main lines increased from 9,100 in 1978 to 30,404 in 1987.¹¹ and it reached 80,000 in 1994. That same year, telephone density stood at 4 per 1,000 population. As of 1993, there were 45 telephone exchanges serving 55 out of 75 districts of the kingdom; 100% of these lines are served by automatic exchanges and 87% of the network is digital. Subscriber trunk dialing is available to 60 destinations. There are 6 regional offices, 32 telecommunication area offices, and 80 long-distance Public Call Offices (PCOs), which provide telephone service in 55 districts. According to a survey conducted by a Japanese special study team, in Nepal, all the PCOs have been heavily used since they were opened and are crowded daily with people waiting to place or receive calls. To avoid congestion, each PCO is equipped with two lines, one for incoming calls and another for outgoing calls. The number of calls handled by each line ranges from 30 to 70 per day. Private telephones are used primarily for business (60%), personal calls (20%), and international calls placed by foreign tourists, mountaineers, and trackers (20%). (Masatomi, 1989)

As in other countries, telecommunications developed at first primarily in and near the cities. NTC introduced point-to-point and multi-access radio networks in a few rural areas, but most outlying districts were originally linked

by rural microwave network. Since the Rural Telecommunication Network Improvement Project was implemented in Nepal in 1987, however, the systems has expanded to include 961 route, kilometers of analog microwave.

With the ever-increasing significance of international contacts for businesses and individuals alike, and especially for the promotion of tourism and related industries, international telecommunications will play an increasingly important role in the nation's economic development. As of 1995, NTC remained the sole provider of international telecommunications services in Nepal and continues to enhance the international telecommunications network. The main outlet for Nepal's international telecommunications traffic is the satellite link accessing the Primary Path Intelsat Satellite over the Indian Ocean region. Nepal is also connected with India via a coaxial system over the land border, interlinking the microwave network of both countries, and with Bangladesh by VHF.

International Direct Dialing service is available to 38 countries, with some 144 international telephone circuits in operation; 20 of these are semiautomatic. In 1990, international telephone traffic grew by 40%, to a total of 7,091,231 paid minutes; 86% is directly dialed by the subscriber. India accounts for 65% of the total outgoing telephone calls placed from Nepal, followed by the United States,

Japan, and the United Kingdom.

Domestic telephone service has improved significantly since its founding in the early 1970s , with a drop in the fault rate from 18 per hundred subscribers per month during 1988/89 to 16 faults in 1992. This is due in large part to the fact that in 1989 Nepal spent US\$16.2 million on new telephone plant and equipment.¹² In 1991, the expenditure was US\$21.4 million. In 1993, the expenditure was US\$45.5 million.

7.6 New Plan of Telecommunications

Under the 1991-2000 Master Plan for the area, Kathmandu City and Kathmandu Valley will be equipped with 100,000 telephone lines (all digital), two international exchanges, a high-capacity transmission network, and local cable networks. It is hoped that telephone density in the valley will be tripled and upgraded to CCITT standards. The plan also includes equipment to support increased data transmission and television transmission needs. With regard to further improvements in quality service, NTC expects to reduce the ratio to only one fault per hundred subscribers per month, or less than 0.5 fault per connection per year.

The government's fifth telecommunication plan (1992-1996) also intends

to build up the neglected communications infrastructure in outlying regions, about 27% of which consists of remote, snowbound, mountainous terrain. NTC plans to bring direct subscriber dialing to 2,000 rural subscribers in about 400 area service centers, commercial, and other important centers and eventually to reach all of the country's 4,015 villages. This goal is to be met by installing PCOs, some equipped with digital exchange and digital remote line units, with a capacity of between 250 and 1,000 subscribers each. High-frequency radio will continue to

be used in areas situated more than 4,000 meters above sea level. Also planned is the installation of modern telecommunications facilities to link remaining district headquarters via point-to-point microwave radio, thin route satellite links and a multi-access radio system, as well as connecting about 3200 subscribers by means of several MARTS systems. The fifth plan provides as well for a new Kathmandu-Pokhara-Bhairahawa-Nepalgunj microwave system, in addition to new fiber optic systems in junction network and a new international gateway exchange.

7.7 Adopting Advanced Technology

Small and still largely undeveloped, Nepal has been forced to base its

telecommunications expansion on pragmatism rather than ideology. As a result, the new system is characterized by very advanced technology, including a computer-based operations management system.

Geography and decades of neglect dictated, first of all, that the country leapfrog over older, less-expensive regionally produced equipment into wireless and digital technology that could be purchased. Solid state technology is far more efficient and robust and requires much less maintenance than electro-mechanical systems, so it is much better suited to Nepal's harsh climate and terrain. Fully digital systems are also, in general, less costly, more efficient and more flexible than electro-mechanical systems. NTC has introduced digital exchange equipment as well as installing 17,100 lines of E10-B and 47,000 lines of S12 lines. Both the radio communications equipment and telephone exchanges installed are the ultimate in high technology--they are practically solid integrated circuits, designed in modules so that defective sections can be easily removed and replaced, making operations and maintenance easier. In fact, with a digitalization rate of 87%, Nepal might almost be considered a "digital island" in South Asia.

In addition, as mentioned earlier, NTC plans to install a new international gateway exchange and fiber optic systems in the junction network. Fiber optics

plays an increasingly important role in the drive to digitalize public transmission networks. Digitalization will also spur demand for primary order multiplexing, digital cable, and digital microwave systems. NTC is also planning to introduce mobile and data communications services by the year 2000.

Nepal has not only invested heavily in the development of its telecommunications networks, but has also emphasized post-investment operations management and maintenance, in order to make efficient use of the very sizeable initial capital investment. Like most developing countries it suffered from low telephone density, high calling rates, relatively inferior quality of service, and a very large work force. As telephone networks grew in size and complexity, the inadequacies of traditional operating methods became apparent: inefficient use of a large work force, excessive complexity of and inefficient use of information on piles of paperwork, in part due to the difficulty of maintaining up-to-date network data and operational statistics.

To counter these problems, an operations management system developed by Televerket (Sweden) was established as part of an International Telecommunications Union (ITU) project between 1984 and 1987, based on existing local human, material, and financial resources.¹³ Fundamentally, this system, aims at making the best use of capital by providing good quality, reliable

service, lowering operating costs, and improving the efficiency of the whole telecommunication undertaking at a small fraction of the capital cost. It is basically constituted of maintenance control centers (MCC), field units corresponding to maintenance areas, and a computer facility. Three operations are carried out by the system: execution of straightforward work procedures at the MCC, recording of relevant data in an easily accessible and comprehensible form, and production of operational statistics via computers.

In addition to improved maintenance management, network information, installation control and constructive control, the cost-effective MCC system also helps to ensure efficient usage of expensive plant facilities, an acceptable level of service, and moderate operating cost. Since it was instituted, monthly fault rates per 100 subscribers have dropped from 120 in 1983 to 66 in 1984, 26 in 1987,¹⁴ and only 14 faults in 1990.

7.8 Dependence on Foreign Aid

The down-side of leapfrogging into the wireless world with digital telecommunication is Nepal's heavy dependence on foreign aid. Lack of local production capability has led to reliance on foreign investment, technology, equipment, supply, and personnel, some financed by bilateral aid from countries

such as Japan, Finland, and Denmark, which paid for goods and services supplied by their own national firms. Other Nepalese telecommunications projects are funded by the World Bank. For example, in 1992, the World Bank approved a loan of US \$24 million to address network shortages and improve performance as well as to examine possibilities for restructuring the sector.

NTC approached Japan for assistance in the early 1980s. In 1983, the Japan International Cooperation Agency (JICA) mapped out a plan for a state-of-the-art telephone network linking all district headquarters and major commercial and tourism centers. With the assistance of JICA, the Rural Telecommunication Network Improvement Project was founded, and the agency financed new public call offices in approximately 64 locations. NTC expected Japan to renew its assistance to cover further installations, but JICA declined to finance the remaining parts of the program. Finland and Denmark stepped in instead to finance Nepal's local and long-distance transmission infrastructure, and these two countries have also funded NTC's program to update its outside plant (OSP) in major commercial centers and to reach the unserved 26 of the kingdom's 75 rural districts.

While Denmark's aid agency, Danida, has been interested in urban installations, its Finnish counterpart Finnida's focus has been on extending service

to rural areas, especially in the difficult terrain of the northwest and southeast. The grants they have provided during Nepal's Seventh Five-Year Plan have led directly to contracts for Scandinavian suppliers.

Danida's grant of \$15.5 million to Nepal gave Carl Bro International, a Copenhagen-based consulting firm, an opportunity to get involved in NTC's plans for the expansion of the national network. Carl Bro has helped to supervise the installation of outside plant in Kathmandu and other major cities in Nepal. In addition, NKT was awarded a contract for the installation of copper cable for the local urban loops [28]. Carl Bro has also carried out a feasibility study for a nationwide public pay-phone network. Using \$5.3 million financing from Finland, Nokia installed a new digital transmission link from Kathmandu eastward [30]. Finnida financing also paid for Nokia equipment in the early construction of NTC's digital transmission network.

The World Bank has also helped to upgrade and expand Nepal's telecommunications system by offering 20 multi-access radios as a part of a \$28 million International Development Assistance (IDA) credit. The remaining funds have financed earth station enhancements and the purchase of office, telex, and transmission equipment.

Project financed jointly by the World Bank and is the Finnish government

computerized billing network, which will produce telephone and telex bills for the whole country by using personal computer-based local area networks.

7.9 Socio-economic Impact of Telecommunications Development

A stronger telecommunications system can help to lay the foundation for modern statehood by increasing Nepal's economic and commercial efficiency, improving its social and emergency services, and achieving a more equitable distribution of the social, cultural, and economic benefits of development. Most important, perhaps, by multiplying interaction at all levels it helps to forge a unified nation.

The new telephone networks have broken up the isolation of local villages and districts, facilitating the exchange of information and extending administrative management. By 1994, telephones reached 55 out of 75 administrative districts, and by 2000 NTC plans to bring direct subscriber service to about 400 ilaka service centers and eventually to all 4,015 villages. Subscriber lines available at present are allotted to major government offices and are used primarily for arbitration and to settle problems between local residents and divisions of the central government. The district panchayats also use them, to maintain contact with the central authorities and with organizations in neighboring districts.

In addition to daily administrative or commercial traffic, the communications system has proved indispensable in coping with disasters and emergency situations. In September 1988, a large landslide occurred in a remote mountain hamlet about six hours by foot from Beni and sixty of the 130 villagers perished. A runner was sent from the village to Beni, where officials promptly put through a call to Kathmandu for rescue assistance. To the villagers' surprise, a rescue party arrived the following day,¹⁵ when without the telephone it would probably have taken a full week.

Communication facilities are a precondition for tourism development. It is only possible to attract foreign travelers when they can access reliable information of services and facilities about the potential destinations. Travelers will feel safe in their trip if they can connect with police offices, hospitals, travel agencies, or their family members.

Nepal's tourist industry has grown rapidly, from 156,123 visitors in 1978¹⁶ to 265,000 in 1988¹⁷; hotel beds increased from 2,099 in 1977 to 7,086 in 1986.¹⁸ It is now Nepal's single-largest foreign exchange earner, yielding US \$63 million in 1988¹⁹ Suraiya, and bringing much-needed employment and other benefits to some less developed regions of the country. Yet growth in tourism must be supported by continued growth in communications facilities, to provide visitors

with reliable information and ensure access to travel services, medical facilities, and family members back home.

7.10 Outlook

One change that will occur in the telecommunications sector is the introduction of private participation and eventually the privatization of NTC. The road to private participation of the telecom sector began during the 5th Telecommunications Plan, which included studies on the restructuring of the sector. Although in 1995, the government was still reviewing plans to privatize NTC, the move toward private participation in the sector began in 1994 when the government signed a Memorandum of Understanding with the Telecom Holdings, a subsidiary of Telecom Asia of Thailand, for a build-operate-transfer telecom project.

In August 1995, the Ministry of Information and Communications announced preliminary invitation for applications from private companies to establish, operate, and maintain telecommunication network services. The request was expected to be finalized by the end of 1995. The final request for license applications is expected to include the following networkers/services:

1. Basic Telephone Services based on New Technology, e.g., Wireless in Local

Loop (Will), etc.

2. Cellular Mobile Radio Communications services.

3. Radio Paging Services

It is expected that the introduction of private participation is a prelude to the privatization of Nepal Telecommunications Corporation. Subsequently, numerous international telecommunication companies are positioning themselves to take advantage of future changes in Nepal's telecommunications market. For example, in 1994, Jo Smine International DLC, a major Thai conglomerate established a new company to operate telecommunications businesses in Nepal and other neighboring countries.

Nepal seems to recognize that an efficient, modern telecommunications infrastructure is vital for efficient governance and socio-economic development. Because of its small size and limited resources, telecommunications development will continue to be influenced by foreign aid and international organizations. Whether these new systems are used to benefit the old elite or the new elite, and whether they will reach the underserved in remote areas, are open questions. The answers will depend on both the country's internal politics and on the preferences of its benefactors.

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