

Chapter 18

Improving Accessibility for Mountain Development: Role of Transport Networks and Urban Settlements

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18.1 Introduction

The age of development commenced with the unanimously recommended strategy of modernisation. The concept of modernity was synonymous with growth. To sustain and accelerate economic growth an adequate physical infrastructure was a prerequisite or constituted an eminent component of the developmental paradigm. Surprisingly or not, in this respect there was very little difference between the two predominant ideological role models of the 20th century. Mobility and urbanisation were the key parameters of the goal of modernisation, and the process of development required specific strategies. The idea behind all this was that overall development could be achieved by breaking with tradition, by relocating people from rural to urban areas, and by improving the accessibility of formerly peripheral and remote regions. An overall increase in exchange and mobility was envisaged as the tool to solve the problem of backwardness and underdevelopment. The principle of unlimited growth was finally challenged by perception of the limited resources available. In a global perspective, the unrestricted growth model had failed and was succeeded by sustainable growth as suggested in the Brundtland Report of 1987. Nevertheless

development thinking and practice continue to be strongly influenced by previous concepts. This persistence needs to be taken into account when focusing on recent developments in mountain areas.

How are these general remarks about developmental paradigms related to the topic of improving accessibility for mountain development? If we try to analyse the role of transport networks and urban settlements, we have to apply a historical perspective and review the processes of improving accessibility and urbanisation to date. The relationship between infrastructure established and its impact on indicators of development needs to be defined. The existing concepts of accessibility and urbanisation have to be evaluated in relation to their efficiency in describing processes relevant for mountain development today before prospects for future development in South Asia's mountain areas can be foreseen.

18.2 Accessibility and Imperialism: Railways

The paradigm of modernity has matured to become a concept that is applied globally. Traffic infrastructure has reached all areas of economic importance. The first railway lines were introduced into South Asia less than three decades after the beginning of railways in Europe. The East India Railway Co. was founded in March 1845, the first line became operative in 1853. Daniel Headrick highlights the importance of this 'tool of empire':

“The 1840s were a time of railroad fever in the Western world, and most of all in Britain. Building the railroad system of India became the most monumental project of the colonial era; it involved the largest international capital flow of the nineteenth century, and produced the fourth longest rail network on earth ..” (Headrick 1981).

During the 19th century, contemporary modern traffic was planned along railway lines. Russian colonisation and introduction of physical infrastructure in Central Asia followed an approach similar to that of the British railway networks in India.¹ Railways connected commercial and population centres with seaports and industrial cities. In both empires railheads ended at the foothills, leaving a mountain barrier in between.

With few exceptions, the railway revolution brought about less change in the Himalayan arc than in the European Alps. Railway lines, such as the ones from Kalka to Shimla (opened in 1903), Hardwar to Dehra Dun (1900), and Siliguri to Darjeeling (1880-1886), are remarkable and rare cases in point² (Bhandari 1984).

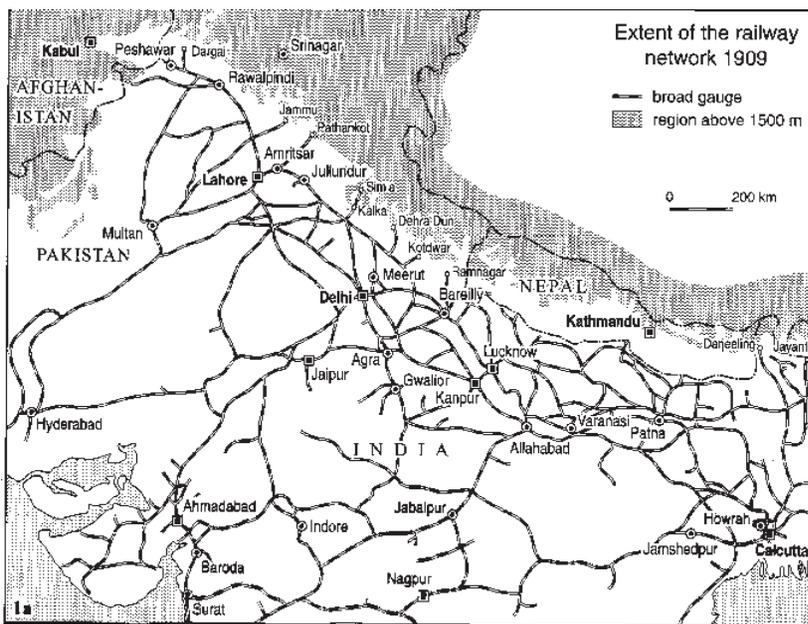
¹ The Russian railhead at Andijan which was linked in 1899 with the Middle Asian in 1899, became the starting point for enterprising traders travelling to Eastern Turkestan and the mountain areas of Central Asia.

² The Kalka-Simla railway climbed from 640 to 2,150 m, going under 103 tunnels and covering a distance of less than 100 km (Kanwar 1990, 40; Kennedy 1996, 91). The Darjeeling Himalayan Railway (DHR) operated the 88 km of line from Siliguri to Darjeeling covering an altitude of from 150 m to the highest point above 2,200 m. The construction of the DHR Extension from Siliguri Kalimpong began in 1914-1915, but was never completed as a result of natural hazards. The final decision not to continue rail construction towards the Himalayan range was made in 1950.

They opened up the mountain barrier for visitors to the growing numbers of hill stations and the Indian summer capital, Shimla. While in 1873 a journey from Calcutta to Darjeeling (666 km) could take as much as eight days (e.g., for the artist Edward Lear), by the end of the 19th century the same journey took less than 21 hours, and by 1940 less than 14 hours.³ (Kennedy 1996). Emphasis was put on the accessibility of hill stations, the majority of these settlements could be reached from a railhead within a range of less than one hundred kilometres (Figure 18.1). These services were provided for the exclusive and small group of imperial travellers, while other mountain areas remained untouched by them and their economic development was not significantly linked to railways.

Nevertheless, the vision of the imperial mountaineer, Martin Conway, did not materialise. He had predicted substantial establishment of railways in the Karakoram mountains at the end of the 19th century:

“... Gilgit must grow to be an important trade centre, and possibly, a railway junction on the line from India to Kashgar, where the Samarkand branch will turn off!” (Conway 1894)



Source: The Imperial Gazetteer of India Atlas 1909, Plate 22

Design: H. Kreuzmann

Figure 18.1a: Extent of the railway network

³ In 1982 it took me nine hours to travel by ‘toy train’ from New Jalpaiguri to Darjeeling (90 km) after spending a night in the train from Calcutta (Sealdah) to the starting point of the narrow-gauge train.

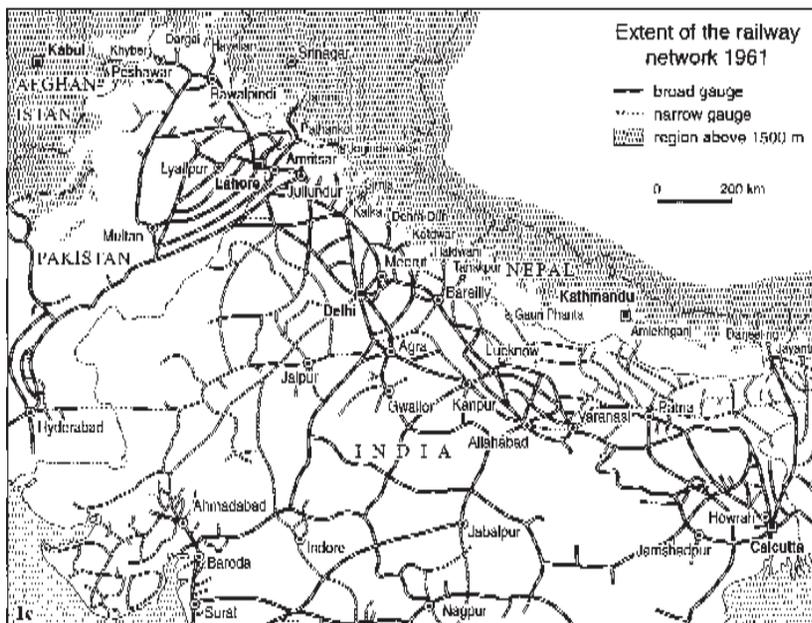
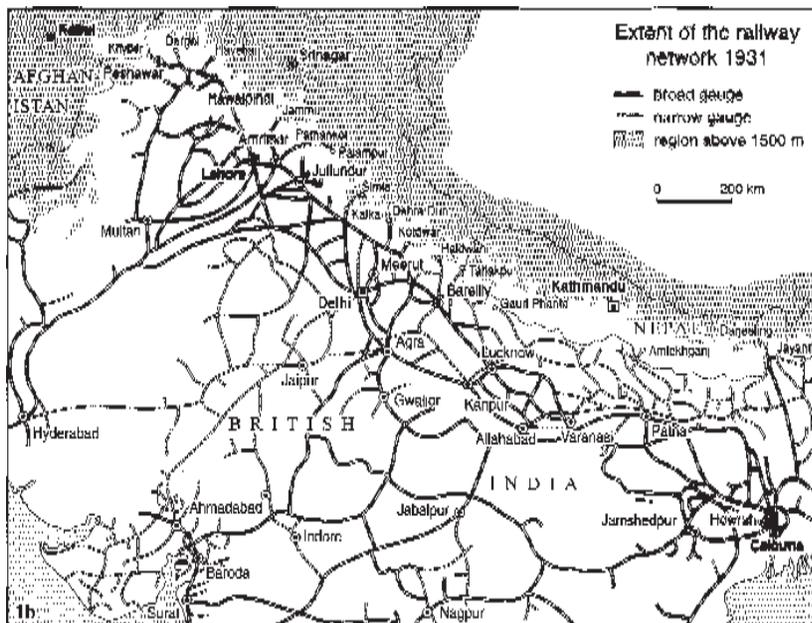
Railway networks were extended to the lowlands and helped to reduce the cost of transportation for bulk goods everywhere. The one-sidedness of this technology is highlighted by the fact that, between 1865 and 1941, about 700 locomotive engines were built in India while 12,000 were imported from Great Britain (Hurd 1982).

The only country where big new railways leading towards the mountain arc have been planned and constructed in recent years is the People's Republic of China. During the Tibet-Xinjiang conference in Xining in 1998, certain serious considerations were discussed about three different railway lines connecting the provinces of Qinghai and Yunnan with the Tibetan capital. Beyond Lhasa, railway lines are meant to run into the South Asian network in a second step. At least in the blueprints! In 1999 the Trans-Xinjiang railway towards Kashgar was completed and started operating.⁴ Experiencing a change in the esteem with which they were held, the railway lines south of the Himalayan arc were not extended much after 1931 and remained essentially unextended after independence (Figure 18.1).

Other communication and exchange relationships deserve attention. In contrast to the colonial incapability of bringing 'modern' traffic into the mountains on a large scale and thus reducing the impact of the 'mountain barrier', important trans-montane trade routes flourished and were responsible for substantial trade in valuable commodities (Figure 18.2). The salt trade between Tibet and Nepal, the Tibetan 'pashmina' (cashmere wool) trade via Kashmir, the sale of Badakhshani opium in the Ferghana oases and along the Southern Silk route, and Yarkandi 'charas' (hashish) as a commodity destined for the plains of the Indian subcontinent are only a few cases in point; and in addition jade from Khotan, silk and carpets from their various places of origin, and uncounted bales of material that changed the tailoring and dressing habits of the people living along the trade routes significantly⁵ (Mason 1936; Fürer-Haimendorf 1975; Bishop 1990; Stevens 1993; Choudhury 1996; Kreutzmann 1998a, b; Stellrecht 1998). The mountain communities which became involved in these businesses made ample use of their opportunities to generate off-farm income by providing transport and services to traders. Consequently, many groups of mountain dwellers were able to change their lifestyles and to broaden their earning bases by breeding transport animals or carrying loads themselves. The service sector connected with 'traditional' mobility should not be underrated as these 'agents of change' left significant traces themselves.

⁴ The railway station in Kashgar was not ready for the scheduled opening of the new line on the 50th anniversary of the People's Republic of China.

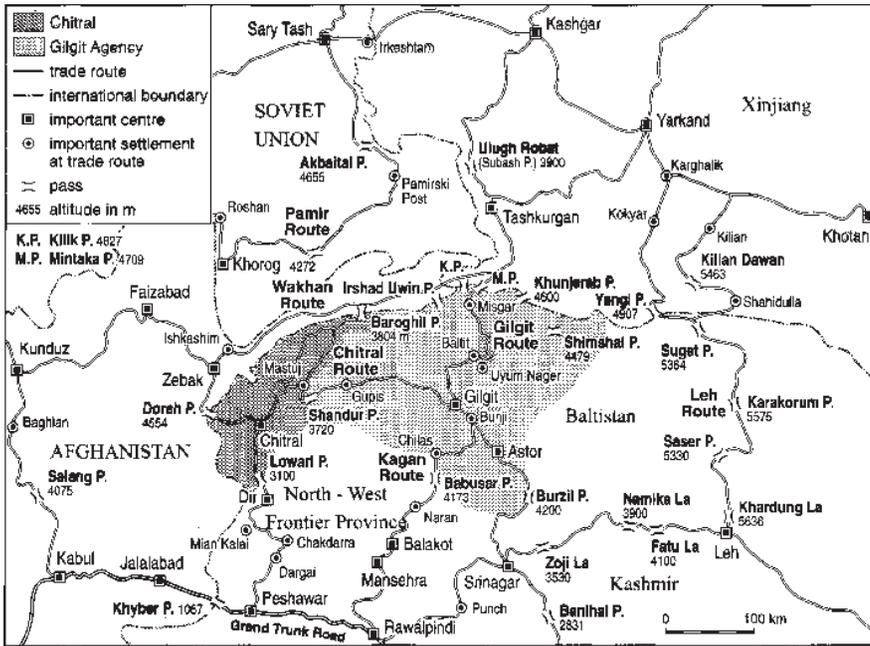
⁵ Starting with the impact of railways, Kenneth Mason (1936) argues from a strategic point of view. Consequently his perspective concentrates on the changes in the Himalayan arc as a communication barrier based on developments in the modern traffic sector (roads and air routes) neglecting the above-mentioned existing forms. More recent research has shown their impact.



Source: revised and extended from Schwartzberg 1992, p. 126

Design: H. Krautzmann

Figure 18.1b & c: Extent of the railway network in 1931 and 1961



Source: revised from H. Kreutzmann 1991 : 720

Figure 18.2: Important trade routes between Central Asia and British India in 1935

18.3 Accessibility after Independence: Road Systems

In the 20th century, motorised transport became the appropriate technology and revolutionised communication. The advent of motor vehicles and the construction of roads in the mountain belt began in a singular mode and required a different planning background from that of railways. Roads for small four-wheeled vehicles can be built following traditional mule tracks, which need some extension or amendment and, especially, strong cantilever and suspension bridges. Some regions were connected to motor traffic already during colonial times. These enterprises were the adventurous ones, for example the Citroen expedition across the Karakoram – devoid of any roads at that time - in 1932 en route from Beirut to Beijing. Prior to that the first motor car was brought to Chitral in pieces and was re-assembled to run in the main valley on specially constructed roads for the local ruler. Direct access to Chitral by crossing the Lowari pass (3,100 m) was only possible after 1947⁶ (Kreutzmann 1998a). Two years later, the first motor vehicle made its way into Gilgit (Kreutzmann 1995a). The completion of the Tribhuvan Rajmarg in 1956 linked

⁶ It took another five years, after widening the road between Dir and Chitral (Fig. 2), for regular traffic to commence.

Kathmandu to the border town of Birgunj in the Terai (Table 18.1). Prior to this event a limited network of motor roads existed in the Kathmandu Valley. Bhutan's most important places – Paro and Thimphu – were initially linked to the Indian road network in 1962 when the Indo-Bhutan Highway started to function.

Table 18.1: Major trans-montane road systems in high Asia

Mountain Range	Destination	Name	Pass	Altitude (in m) ¹	Length (in km) ²	Date ³
Hindu Kush	Kabul-Jalalabad-Peshawar	Khyber Road	Khyber	1067	232	1963
	Kabul-Qizil Qala-Dushanbe	Salang Road	Salang	3600	497	1965
Pamir	Osh-Khorog	Pamir Highway	Akбайtal	4655	728	1932
	Dushanbe-Kala-i-Khum-Khorog		Shorobot	3252	536	1940
	Khargosh-Khorog	Pamir-Ishkashim	Khargosh	4344	280	
	Murghab-Tashkurgan	Gorno Badakhshan-Sarikol	Khulma			1998
Pamir/Karakoram	Khunjerab-Tashkurgan	Friendship Highway	Khunjerab	4550	120	1968-86
Pamir/Kun Lun Shan	Kashgar-Tashkurgan		Subash	3900	294	1958
Tianshan	Kashgar-Naryn-Bishkek	Xinjiang-Kyrgyzstan	Torugart	3752	600	1983
Kun Lun Shan	Yarkand-Gartok	Aksai Chin Road	Khitai	5341	1200	1956-57
Karakoram/Himalaya	Khawazakhela-Chilas	Indus Valley Road	Shangla	2150	278	1959-65
Karakoram	Thakot-Khunjerab	Karakoram Highway	Khunjerab	4550	735	1964-78
	Gilgit-Skardu	Skardu Road	-	-	210	1950-68
	Abbottabad-Gilgit	Kagan Route	Babusar	4173	420	1948-49
Himalayas	Rawalpindi-Srinagar	Kashmir Road			320	
	Jammu-Srinagar	Banihal Road	Banihal	2196	330	1955-60
	Srinagar-Leh	Ladakh Road	Fatu La	4100	435	1962-74
	Leh-Khardung La-Thoise	Nubra Road	Khardung La	5636	80	1980
	Birgunj-Kathmandu	Tribhuvan Rajpath	Daman		221	1953-56
	Kathmandu-Xigazê	Arniko Rajmarg	Zanglu	5481	500	1963-67
	Kalimpong-Xigazê		Natu La	4310	370	
	Phuntsholing-Paro/Thimphu	Indo-Bhutan Highway			180	1959-1962

¹) Altitude refers to the highest point on the road (pass)

²) Length indicates total destination between connected points

³) Date describes the period of construction and/or the opening of sealed surface/asphalt roads

Source: Extended table from Kreuzmann (1998, 23)

Earlier road networks were developed in the Soviet Union where the Pamir Highway was completed in 1934 linking Osh in Kyrgyzstan with Khorog, the central place in Gono-Badakhshan in Tajikistan via the 4,655 m high Akbaytal pass. These examples of early linkages of mountain regions to existing road networks show the great variety of methods employed to make mountain regions accessible.

Ecological constraints are blamed for the general bias between highland and lowland accessibility, although population density, socioeconomic performance, and strategic interests need to be taken into account. Environmental aspects seem to be of minor importance as railways and roads have not only been brought to areas where natural conditions are favourable. Regional disparities in road networks in South Asia's mountain belt follow a different logic than that of environmental determinism. This observation leads us to the question of planning roads, pressure groups, and specific interests.

The strategic importance of the border regions in the mountain arc has to be seen as the driving force behind development of physical infrastructure. A monumental road was planned during World War II. British blueprints had been drafted for a road connecting Kashmir with Xinjiang in order to support the armed units of the Guomindang General Chiang Kai-shek. This strategic enterprise was for the purpose of military support against Japanese occupation forces in China and Mao Zedong's Red Army. In addition, Soviet influences in Xinjiang were to be controlled, thus a giant project involving 70,000 labourers and army staff was to be executed. As the war ended a short time afterwards, this project did not materialise; and, incidentally, it was immense, having been calculated on the basis of nine million days' work within a span of one year for the section from Gilgit to Kilik Pass alone (IOL/P&S/12/4609). After a lapse of half a century, this was the first serious attempt to realise the prognosis of Captain Medley and voiced in 1896:

“The road [Punjab-Khagan-Chilas-Gilgit-Hunza-Kilik Pass-Yarkand] will in fact become the Grand Trunk road from Central Asia to India.” (IOR/2/1064/45)

However, its implementation was to be subjected to further changes as a result of regional politics. This major road link between the Grand Trunk Road of South Asia (Figure 18.3) and the Central Asian highways following the Southern Silk road was realised after Pakistan's independence and the Chinese Revolution. Its construction was based on the common strategic interests of the neighbours. The Karakoram Highway (KKH) has become a symbol connecting two major regions of subcontinental dimensions and two historical road networks. In our context the KKH is taken as a case in point for discussing the overall results of projects to bring about strategic accessibility.

Case study: Karakoram Highway

The first link for 'modern' traffic from Northern Pakistan with down country Pakistan was established from the railhead in Havelian (NWFP, Figure 18.1) via the Kaghan

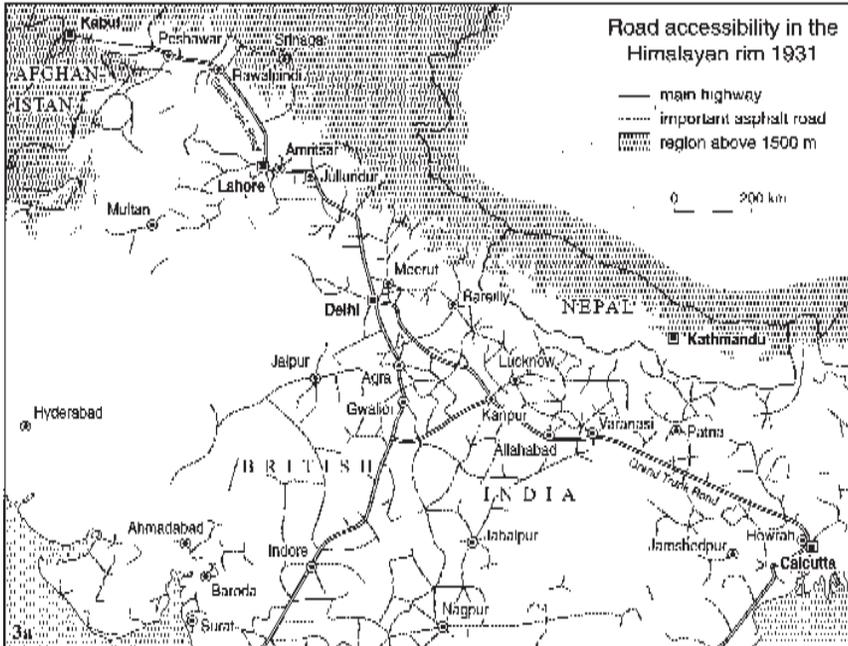


Figure 3a

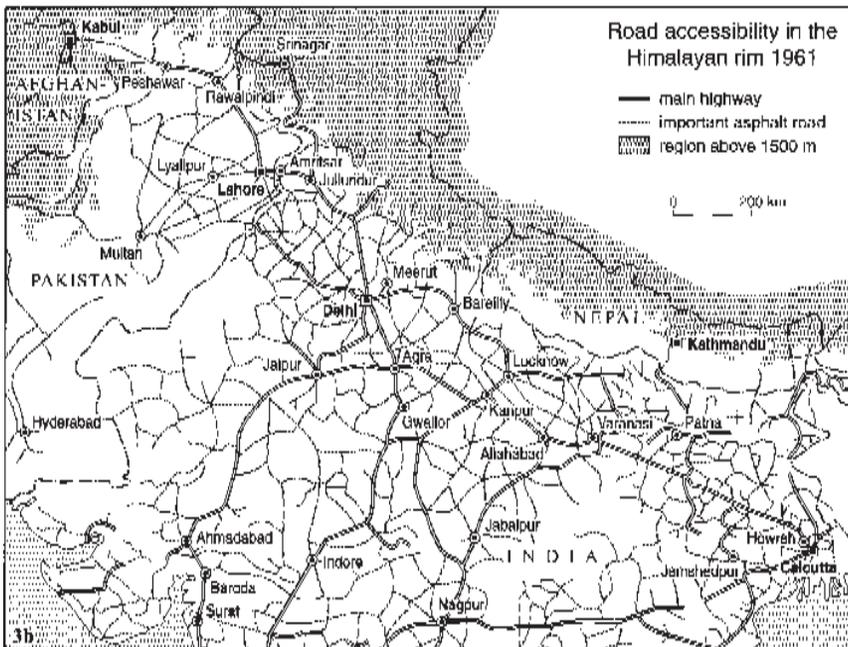
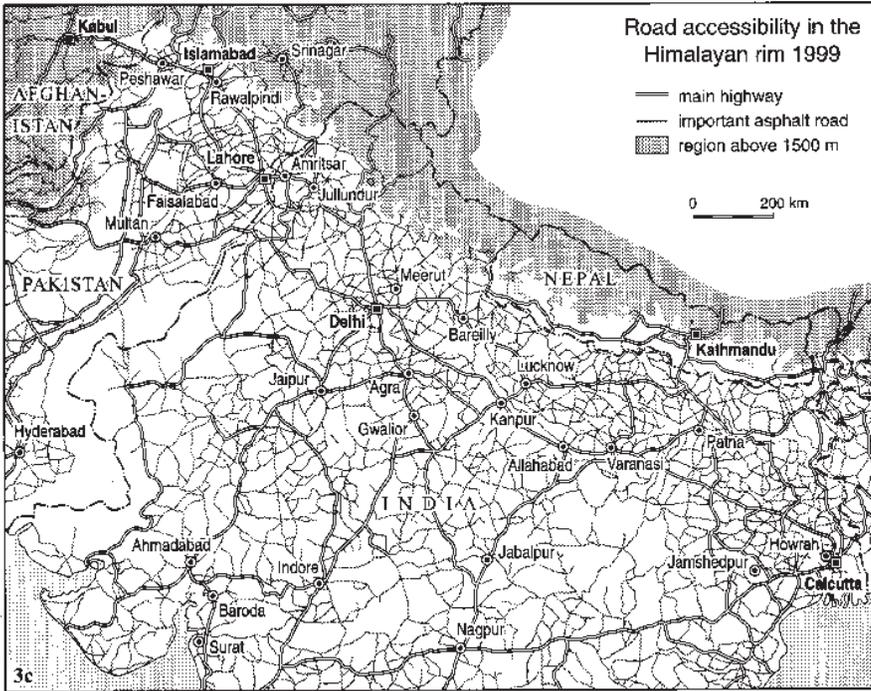


Figure 3b

Source: modified after Schwartzberg 1992, p. 185

Design: H. Kreuzmann



Source: Indian Subcontinent (1:4 Mio.) 1999

Design: H. Kreutzmann

Figure 18.3a, b, & c: Road accessibility in the Himalayan rim 1931, 1961, & 1999

Valley in 1949. This route followed a mule track built in colonial times to support the British administration and the garrisons in the Gilgit Agency.⁷ It was only after independence that the first jeep reached Gilgit - a cul-de-sac of its own - before the track was extended to Hunza in 1957⁸ (The Times 1949). The road across Babusar Pass (4,173 m) remains open for three months in summer only and during the rest of the year air links transport valuable supplies at high cost.⁹

After the inception of Pakistan’s first Village Aid Five-Year Plan in 1956, development efforts paid for by public funds reached the mountains and were made available to the Gilgit Agency. A participatory approach facilitated the construction of suspension bridges to span the Hunza River near Danyor and the Gilgit River at Sher Qila. Villagers provided three-quarters of the cost and all the unskilled labour and cut all the wood for bridge construction from communal forests (Clark 1960). In this early

⁷ Before 1935 the Gilgit Agency was supplied with goods via Burzil pass (4,200 m) from Srinagar. After the lease of Gilgit to British India, the Babusar route was expanded and improved by military engineers and contractors for the summer caravans. Both routes were closed in winter because of heavy snowfall.
⁸ A photograph of that event is on display in the Gilgit Municipal Library.
⁹ Air traffic between the Punjab and Gilgit was introduced as early as 1927.

stage of development the Central Government covered '75% of all non-recurring expenditure and 50% of recurring expenditure' (Clark 1960) trying a holistic approach by introducing new wheat varieties, new ploughs, different fruit varieties, improved livestock (pedigree bulls, merino rams, and so on), silkworm production, and new weaving looms for local tweeds. Out of the annual Village Aid Programme's budget of Rs 300,000 (circa US \$ 65,000), two thirds were spent on transport alone. Without accessibility goods from the lowlands sent to places in the mountains where they were needed were very expensive. Consequently, the budget remaining for development projects decreased substantially.

Not surprisingly, the transport charges for one 'maund' (1 'maund' equals 37.32 kg) of goods from Rawalpindi to Gilgit were from 25 to 35 Rs, while carriage costs on the return trip ranged between zero and eight rupees (Staley 1966), highlighting the limited to negligible exports from the mountains. Air transport from the plains to Gilgit increased the cost of a sack of chemical fertiliser by a factor of twelve from five to 60 rupees (Clark 1960). In order to reduce transportation costs for basic goods, an Indus Valley Road from Swat was proposed and in 1959 construction began (Table 18.1). As a result of the Pak-China Border Treaty of 1963, bilateral cooperation led to what has been termed the Pak-China Friendship or Karakoram Highway (KKH). By 1975 the KKH was carrying trucks, and since 1978 regular traffic has plied between Rawalpindi and Gilgit.

In addition to trans-montane exchange of goods, the KKH brings in subsidised cereals from down country Pakistan into the region. It is the lifeline for Northern Pakistan with its ever-growing food deficit (Table 18.2). Cereals, fresh meat (imported as live animals for slaughter in the bazaars), and cooking oil account for more than three quarters of all imports from the lowlands. The per capita dependence on supplies through this artery is highest for the Gilgit District and significantly lower in Chitral and Baltistan. Chitral will be seasonally cut off from external supplies until the tunnel under the Lowari Pass is completed.¹⁰ Baltistan has been linked to the Karakoram Highway by an asphalt road that now enables year-long traffic and a rapid change in the market prices of basic commodities.¹¹ In addition to its obvious military importance, huge quantities of food are brought into the region to supply army personnel, tourists, and growing numbers of local farming and trading households.

As early as 1972, the Government Report of Abdullah (1972) advocated the regular supply of basic food items to northern Pakistan from the grain chambers of lowland Punjab. The concept proposed favours an exchange of a different range of cash

¹⁰ The Lowari tunnel has become a story in its own right. After planning for two decades, work commenced in the 1970s but was stopped soon after and never commenced again. The tunnel has become a symbol of the unkept promises at prime ministers and candidates to their electorates.

¹¹ The Baltistan road did not exist as such in previous times when Baltistan was oriented towards Srinagar. In 1963 the first road link to Gilgit was established across the Deosai Plateau, two years later by the Indus Valley. The road was extended and asphalted in the mid-80s.

Table 18.2: Import of regular items from the lowlands to the eastern Hindu Kush and Karakoram valleys of northern Pakistan in 1989

Commodity	Import via Karakoram Highway (in million Rs)				Import via Lowari Top Road (in million Rs)	
	Gilgit District		Baltistan District		Chitral District	
	absolute	%	absolute	%	absolute	%
Wheat flour and grain	70.00	34.7	3.60	15.4	23.00	49.5
Rice					13.00	28.0
Pulses	7.00	3.5				
Cooking oil	37.00	18.4				
Fresh vegetables	9.30	4.6	2.74	11.7	1.61	3.5
Fresh fruit	5.04	2.5	0.68	2.9	1.83	3.9
Beef and mutton	29.95	14.9	10.01	42.8	1.21	2.6
Poultry products	18.30	9.1	5.72	24.5	0.84	1.8
Milk products	17.57	8.7	0.64	2.7	5.00	10.7
Fruit juices	1.25	0.6				
Kerosene oil	6.06	3.0				
Total	201.47	100.0	23.39	100.0	46.49	100.0
Total (Rs per capita)	738.6		83.2		172.2	

Source: Data compilation and calculation according to Khan and Khan (1992: 15) and Kreuzmann (1994: Figure 7)

crops from the mountain valleys with surplus staple foods from the plains, with transport subsidised from public funds. In Abdullah's opinion, self-sufficiency in cereal production cannot be achieved in the mountain valleys. For example, the highly subsidised and competitive prices of wheat flour (ata) cannot be met by local producers. Consequently, the proportion of food produced locally is steadily decreasing. In some villages of the Hunza Valley, local production of ata nowadays is less than one third of the household's annual consumption. The dependency on down-country supplies for other consumer goods is even greater than for flour. Consequently, for the first time in history there are now no periods of starvation and famine, as such disasters have been prevented by subsidies and crisis management on the part of the Federal Government and the World Food Programme.

The observation of Robert Chambers that research and development projects follow networks of roads (Chambers 1983) has been supported by the extension of major development projects to this region in the aftermath of construction of the KKH. The Government of Pakistan and non-government organisations with international funding have established rural development and community services' projects. These projects are having a substantial impact on the physical infrastructure, local trading, education, and health services. Their efforts also focus on the extension and improvement of existing agricultural resources. By applying economics to different scales of production, they aim to increase productivity through the cultivation of

valuable niche products such as seed potatoes, vegetable seeds, and special varieties of fruit (Khan and Khan, 1992; Kreutzmann, 1993a, b; Streefland, Khan, and van Lieshout 1995). Exchange of goods between the lowlands and highlands is the impetus for this.

In periods of crises, these development models based on long-distance trading relations for cereals and other staples are vulnerable. Possible drawbacks must be kept in mind. Closure of the road because of natural or hazards caused by human intervention can have dreadful results. In the case of the Karakoram Highway, the engineer corps are maintaining the road and most of the natural hazards – especially in spring and during the monsoon season - are managed in such a way that the affected stretches are re-opened after a short while. Providing a service line throughout the year incurs high costs. It is a great achievement that such a road in extremely difficult terrain provides such a high standard of transportation. Less control is executed when highway robbers and/or politically motivated activists threaten the safety of travel along this lifeline and make use of its uniqueness to exert pressure.

Blockage of the Karakoram Highway by the inhabitants of Kohistan took place in May-June 1993 to convince the public administration that timber exports from the few remaining, and rather depleted, natural forests should no longer be prohibited. The royalties for wood-cutting concessions formed an important source of income in colonial times, especially for the ‘jirgadars’ (residents with entitlements to community resources) of Tangir and Darel. Local unrest and fluctuating timber prices in Punjab regulated the demand and supply situation. Nevertheless, in 1925, six timber companies, as well as the Northern Forest Company, were involved in timber procurement from Tangir and Darel. These companies originated from as far away as Abbottabad, Sialkot, Lahore, Hoti (near Mardan), and Peshawar.¹² Royalties paid by two timber firms in Darel alone accrued to more than 1.2 million rupees in the course of a few years. In comparison, all subsidies received by the hereditary rulers and governors from the Kashmir Durbar and the Government of India amounted to less than 10,000 rupees prior to 1927 and 12,800 rupees later.¹³ Timber has been the most valuable natural resource in the region and a source of income for the jirgadars (Janjua 1998). In neighbouring Gilgit, marginal forest resources appear to have been depleted by 1929, as the administration remarked in their annual report:

“Wood is every year becoming increasingly difficult to obtain. Practically all the wood on the nearest hills and in the nullahs [valleys] has now been cut, and it is necessary to go far afield for supplies.”¹⁴

¹² Records in the Gilgit Agency Diaries between 1921-1930 (IOL/P&S/10/973) provide insight into the practices of timber merchants in exploiting the natural forests of the Western Himalayas and Karakoram.

¹³ IOR/2/1083/284, 59.

¹⁴ IOL/P&S/12/3288, 6.

Nevertheless timber harvesting without appropriate replantation has continued in the Chilas District and Kohistan. In recent years, royalties from this enterprise, the major source of income for the proprietors of forests, have been at stake. While local residents negotiate bilateral contracts with timber dealers annually, the local foresters from the administration identify the suitable stems to cut. Despite the only marginal incomes from toll taxes, the Forestry Department plays a crucial role as a regulative force. Efforts by the administration to restrict overexploitation and to stimulate replantation were counter-checked by the residents by interfering with traffic flow and other measures. The correlation of road access and forest exploitation or, to be more specific, the degree of tree felling is quite substantial (Schickhoff 1998a, b). In this context, questions about ownership and control of natural resources, such as forests, mineral wealth, and water (irrigation and hydro-energy potential), have become political issues relating to the unsolved constitutional status of the Northern Areas. Road blockages occur more frequently as the result of hazards caused by human intervention such as sectarian clashes. These have resulted in tragic loss of life and have led to the closure of the KKH because of unpredictable dangers. These unstable conditions affect other spheres of global and inter-regional exchange like tourism and trade.

The initial construction of the KKH as an artery between the lowlands and the Karakoram has led to a secondary road network of link roads. In the Hunza Valley more than 95% of all households are connected by jeepable or truckable roads. In the side valleys, such as the Gilgit, Ishkoman, Yasin, and Astor valleys and in Baltistan, the same density is planned and has been achieved almost. New suspension bridges were constructed with bilateral aid. Most link roads have been financed by public funds and regional development plans, some of them have come into existence as a productive physical infrastructure programme of the Aga Khan Rural Support Programme (AKRSP). This development agency has taken on the role of a planning institution for accessibility and connection to markets, especially in remote areas where there are a few scattered settlements. In contrast to public enterprises, which are based on institutional planning and sub-contracting (tekedari) of the work, its key advantage lies in its greater cost efficiency. A link road project is executed as a cooperative effort by a village organisation – supplying the initial idea, workforce, and labour input – and by the development institution – providing labour costs, machinery, and technical expertise (AKRSP 1996).¹⁵ The result is a degree of accessibility only reached in the neighbouring mountain areas of India and the People's

¹⁵ With each and every inauguration of a new link road and/or bridge the representatives of the public administration emphasise the quality and low cost of these projects. Even difficult roads, such as the Shimshal and Yarkhun Valley Roads, including major bridges, have been built in this way. Most link roads were built in Chitral (164 out of 277) in 1994 (World Bank 1996, 144-146) where traffic infrastructure lags behind in a valley without all-year round connection to down-country Pakistan. Road construction has become the second-most important activity of this rural development programme only to be surpassed by the construction of irrigation channels.

Republic of China, but quite outstanding if compared with the road networks in Nepal. The quality of roads influences the cost of transportation, and being accessible does not mean a village is on a par with others. For example, potato dealers from Punjab and NWFP purchase seed and potatoes in the Northern Areas. Their main business is concentrated along the asphalted highways, very little commerce occurs on truckable roads, and next to none along jeep roads, although the cost of purchasing potatoes is substantially lower there.

General conclusions from the case study for accessibility patterns in South Asia's mountains

The observations presented here, using the specific case of the Karakoram Highway as an example, could be projected on to other major mountain roads and generalisations derived for the South Asian mountain rimland. What are the parameters of importance?

1. The provision of better transport facilities for mountain people was not the top priority when major road networks were built. The driving force behind road construction was strategic interests. Examples supporting this observation are the Pamir Highway, the Salang Road, Pak-China Friendship Highway, and the Kashmir, Ladakh, and Nubra roads. Especially after the India-China war of 1962, several thousands of kilometres of mountain roads were constructed in the Himalayan belt of India. Road construction led to confrontation between both major players north and south of the mountain arc. In 1956-57, China built a road across the Aksai Chin to connect Xinjiang and Tibet, while both countries claimed the Aksai Chin to be within their borders. Two years later, this construction in a nearly uninhabited region was discovered and made into a cause of confrontation leading to a war (Maxwell 1972, 482-485; Ispahani 1989, 145-213). The incident resulted in increased efforts to control the mountain belt — for which a road network on both sides was needed and which came into being. In the case of Nepal, these strategic considerations are less prominent and are reflected in the extent of the road network, while Bhutan is rather well served with asphalt roads that have all been built by outside support and probably as a result of outside interests.
2. Motorable roads provided better access to the mountain valleys. Consequently, roads built for strategic interests work as agents of change, but are not the results of regional planning efforts. Road access does not reach mountain communities in an even manner. The chances and constraints of accessibility are thus distributed unequally and might cause regional disparities of substantial variation (Table 18.3).
3. Besides differences in accessibility, there is quite a variation in the pace of change along mountain highways. The Karakoram Highway is a good example of major changes in the Hunza Valley and the lesser impacts in Kohistan and other valleys along its course (Kreutzmann 1991, 1995a, b; Daud and Nasir 1998; Janjua 1998). Similar developments could be observed along the Ladakh Road or the Jiri Road in Nepal.

Table 18.3: Opportunities of and constraints on improved accessibility and urbanisation in South Asia's mountain systems

Opportunities	Constraints
Reduction of transport costs: adjusted economies of scale	Reduction in competitiveness of locally produced basic goods
Reduction of economic distance: faster travelling and increased mobility through public and private transport	High investments and regular maintenance costs for traffic infrastructure
Provision of food supplies in emergency cases: relief from the lowlands can be supplied quickly	Dependence on one lifeline with dramatic results in periods of conflict and crisis
Provision of subsidised goods, fuel, and basic items at reasonable prices for local demand	Advance of bureaucratic institutions, tax collectors and controlling bodies
Attraction for investors from outside	Immigration of economically potent entrepreneurs who may dominate local markets
A market approach becomes feasible for exclusive and competitive niche products from the mountains	Growing competition between lowland and highland producers in which the latter regularly become losers because of more difficult cultivation techniques and less productivity in the mountains
Resource potential of the mountains becomes accessible and the exploitation of natural wealth becomes economical	Forest depletion, mining, and construction of high dams cause natural hazards and/or might damage the environmental balance and lead to loss of ecological potential due to the market demands in the lowlands
Improvement of tourism infrastructure and attraction of more visitors result in higher returns from tourism and affect the job market within the mountains	All problems and challenges connected with seasonality, probability values, uncertainty factors, and long-term investments in the tourism industry are experienced here in a similar manner to other tourism destinations
Urbanisation and development of market centres	Dependence on lowland markets and connected exchange relations
Town planning sets the standards for basic infrastructure	Concentration of development funds in urban areas, weakening position for rural areas
Controlled growth of settlements in urban areas and attraction for migrants who experience a higher standard of health and educational institutions	Brain drain from the rural areas and a loss of competent representatives there

Source: Compilation by author

- The impact from the introduction of road systems and improved accessibility to mountain areas should not be underestimated in respect to nation-building in formerly colonised states such as India and Pakistan, or in communist countries such as the Soviet Union and the People's Republic of China with their Central Asian Republics and the 'autonomous' regions of Xinjiang (Tibet) and Xinjiang respectively. Mountain regions have been integrated into nation states and national economies through networks of roads. Consequently, exchange relations are

strengthened to such a degree that those regions become actors within the national economy. At the same time they depend on supplies from the domestic market to a very great extent. In all cases, more goods and valuable items reach the highlands from the lowlands, transport costs are high up and very low downhill; which is not a reflection of slope characteristics but of lack of exportable crops and products for down-country markets. Besides market participation with a limited range of specialised and niche products such as seeds, fruit, and herbs, mountain people compensate for this inequality of exchange relations, in general, through migration of human labour and/or income from service industries such as tourism. From a macro-economic perspective, it seems that mountain societies derive more security in food supplies by paying the price of growing dependency on lowland markets and increased out-migration (Table 18.3). This perspective might be quite different for individuals. More opportunities for entrepreneurs serve a group of insiders as well as outsiders who invest in certain niches while expecting substantial returns.

5. Having made the above observations, it should be made clear that improved accessibility does not mean the beginning of a new economic regime or era. The scale, direction, and speed of exchange relationships are affected and do not necessarily create new phenomena or follow the developmental paradigm. Increased accessibility can increase the turnover within existing exchange patterns, and it can also contribute to a growing number of constraints and/or backlashes (Table 18.3)

If national and regional planning promotes and demands greater participation of mountain regions in the domestic and international markets, then improved accessibility is a necessary prerequisite. As achievements towards this aim are often supported by bilateral or international, government or non-government development aid, a survey of existing development activities in the Hindukush-Karakoram-Himalayan arc notably emphasises the observation that development projects are strongly linked to networks of roads. An infrastructure-related approach towards development is in tune with demands put forward by the World Bank (World Bank 1994).¹⁶ On the other hand, the reports on Human Development in South Asia place less stress on the improvement of physical infrastructure than on the provision of social infrastructure and stable political frameworks for good governance (Mahbub ul Haq 1997; Mahbub ul Haq and Khadija Haq 1998; Khadija Haq 1999).¹⁷ Here, a different perspective of development is presented emphasising that development seems to be rather a societal and not solely a technological problem.

¹⁶ The sub-title of the World Development Report for 1994 is 'Infrastructure for Development'. Infrastructure is perceived in the broad sense and traffic infrastructure is an important aspect of it.

¹⁷ Reports on 'Human Development in South Asia' have been published since 1997.

18.4 Urbanisation in the Mountains

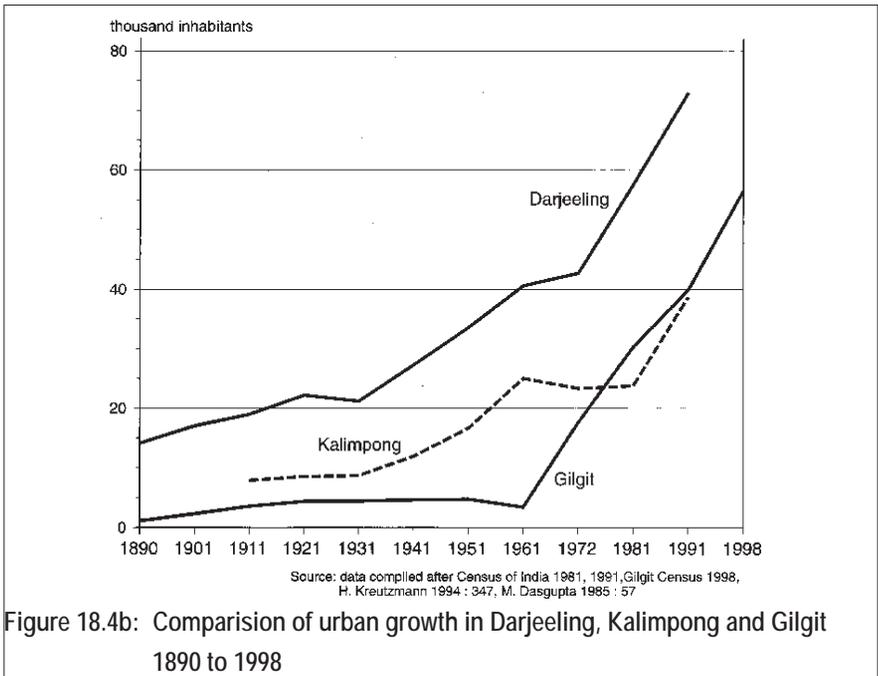
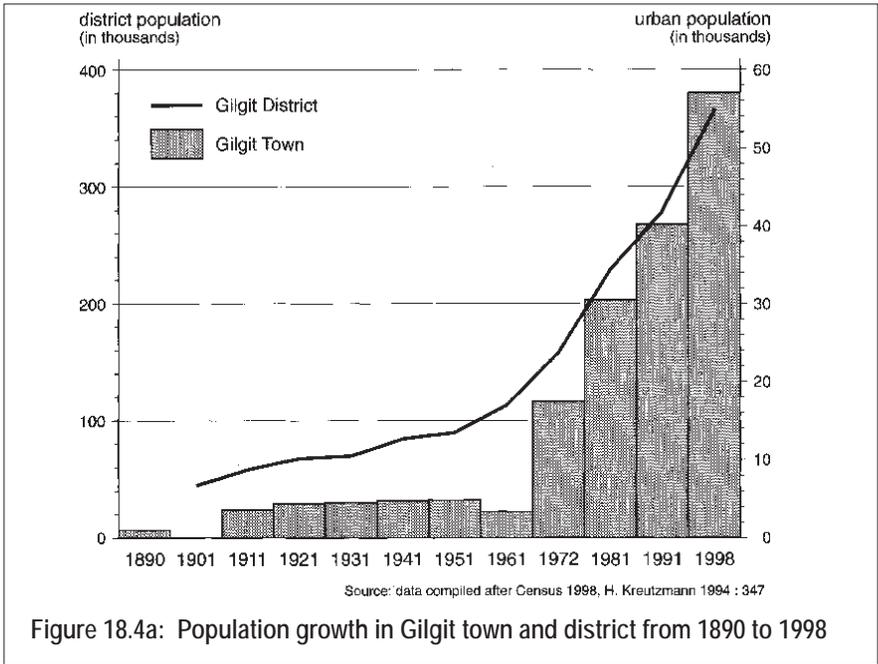
For the followers of modernisation theory, urbanisation is the ultimate solution to development problems. Although this perspective might be challenged, overall urbanisation is increasing and this phenomenon can be observed in mountain regions as well. Discussing this aspect in a historical perspective, we find traditional urban centres in the two major intra-montane basins of South Asia's mountain arc: in the Kashmir and in the Kathmandu valleys. Both became centres of urban cultures as their wealth was derived from trans-montane trade relations in which valuable commodities were involved. Further urban centres are related to the British colonial period when the summer capital was established in Simla and hill stations grew to some functional importance comparable to other cities in the lowlands. Murree, Mussoorie, Almora, and Darjeeling represent such hill stations with recreational, educational, and military facilities (Kennedy 1996).¹⁸

The situation has changed quite dramatically. Formerly small market towns with some trade and military functions, such as Gilgit in Northern Pakistan, had a predominantly rural appearance. A number of similar places can be found in the region under study which occupied a higher status than the neighbouring villages because it was the seat of a ruler, a garrison, and/or a toll post along a trade route (Figure 18.2). Chitral, Leh, Mandi, Gangtok, Kalimpong, Paro, and Thimphu belong to this group of central places. Some of them have experienced tremendous growth in the second half of the 20th century. For Gilgit the boom was strongly connected with the construction of the Karakoram Highway (Figure 18.4a) and occurred in the 1960s. Similar developments occurred in Leh and Kargil as stage posts on the newly-built Ladakh Road. The growth of urban population in Kalimpong and Darjeeling¹⁹ (Figure 18.4b), which had an earlier link to modern transport systems, shows a slightly more gradual expansion. Basically, we find urban growth connected with an increase in market-related economic enterprises and/or the build up of new administrative centres as focal points for regional bureaucracies.²⁰ Increasingly, these centres advance to become the distribution centres for goods and knowledge. Here we find the bazaars in which barter traders from the villages exchange surplus goods from their domestic produce for highly acclaimed and desperately needed basic goods from the lowlands. Moreover, a job market exists in the service industry and monetary incomes are

¹⁸ Kennedy's (1996, map 2) includes, besides the above-mentioned: Gulmarg, Dalhousie, Dharamsala, Sonawar, Solan, Kasauli, Lansdowne, Nainital, Kalimpong, Kurseong, and Shillong.

¹⁹ The growth pattern in Darjeeling reflects that, since its foundation in 1835, the district has matured to become one of the Himalayan areas with the highest population density: in 1971 it was above 200/km² compared to Sikkim's 27 (data according to Dasgupta 1985, 53). The urban

²⁰ Take for example the shift from a traditional regional centre such as Nuwakot in Central Nepal to Bidur, a newly established administrative headquarters located along an asphalt road, population has grown steadily from 19,003 inhabitants in 1911, doubling by 1961 to 40,651, and reaching the 70,000 mark in the 1990s. Other urban centres, such as Kalimpong, are growing fast from 7,880 in 1911 to 41,000 in the 1990s (Fig. 4b).



generated, sometimes these bazaars function as a transition point for out-migrants. The combination of private and public enterprises forms the basis of urbanisation in these central places which become nodes along the transport networks. Information and the distribution of a particular kind of knowledge increasingly become important as assets of these places. For example, the radio station in Gilgit transmits news of job announcements, scholarships available, and tenders for public works in three local languages. Farmers and their family members, even in remote locations, can receive this information by listening to their transistors and contacting the urban centre if they are interested. Market towns function as centres of knowledge as the quality of education and training is better than in rural areas and certain levels can only be attained there (Table 18.3). At the same time, regional planners and development plans concentrate on these central places for the provision of equal standards and the upliftment of mountain regions, and rural locations cannot give such facilities. Accessibility and urbanisation are two phenomena that attract the attention of the actors in development who function as agents of change themselves.

Problems of accessibility concepts: the case of Nepal

The concept of accessibility was introduced into spatial planning and regional science in the heyday of modernisation theory. Thomas Wilbanks applied his model of accessibility to Northern India and, following the same tradition, Nigel Allan projected it on the mountain regions and compared developments in Europe, Latin America, and Asia (Wilbanks 1972, 1980; Allan 1986).²¹ These concepts suggest that physical infrastructure is the major agent of change, and they emphasise this point to such an extent that it seems that development only begins when roads are built. Once a traffic network has been introduced, change comes and leads only in one direction 'towards modernisation'. Following these lines 'traditional' agriculture ceases when roads permit 'modern' agriculture to take place. Empirical evidence shows quite a different and more complex picture. These models that follow a developmental approach are oversimplistic and do not reflect the realities that have been presented in so many case studies to date (Fürer-Haimendorf 1975; Manzardo 1977; Fisher 1987; Bishop 1990; Khan and Khan 1990; Kreutzmann 1991, 1993a,b, 1995a, 1998a,b; Stevens 1993).

Nepal might be the best example of the economic success of certain groups from remote locations not connected to a road, or not yet having an urban centre in their valley. Thakali, Manangi, and Sherpa communities have managed to find other ways of regional development, very often brought about by labour migration, participation in outside trade, and service industries (Manzardo 1977; Fürer-Haimendorf 1984; Chhetri 1987; Schrader 1988; Fisher 1990; Pohle 1993; Stevens 1993). A controversy has arisen over the future Upper Mustang Road, connecting the Annapurna

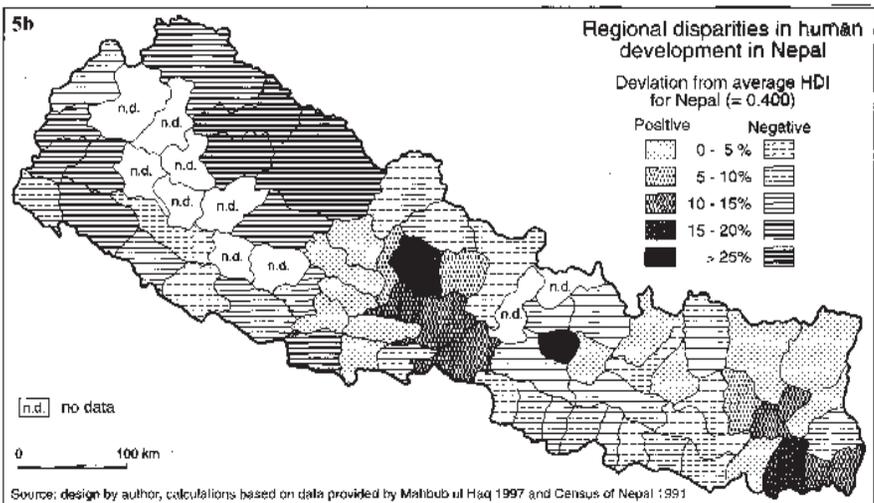
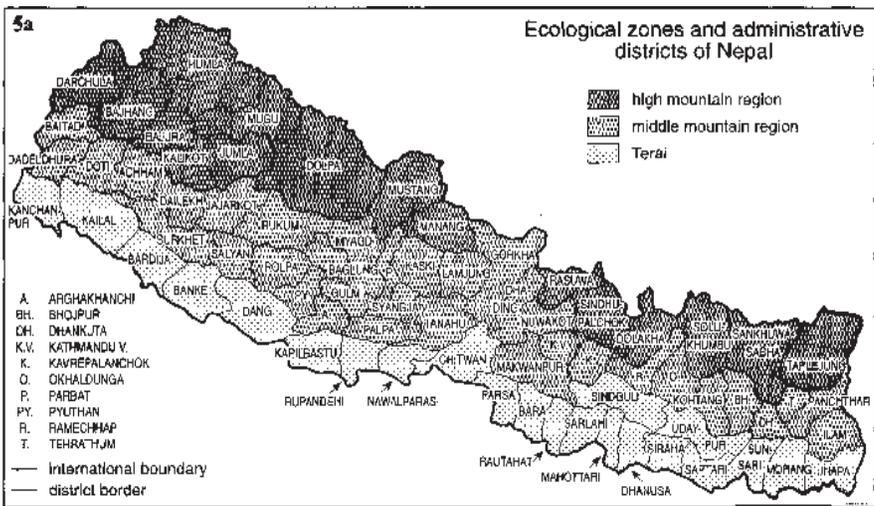
²¹ For a critique of the application of the accessibility model in mountain regions cf. Uhlig 1995 who argues from a different perspective than presented here.

Conservation Area with the Kodari Road (Arniko Rajmarg), and for which there was a groundbreaking ceremony recently.²² Strong arguments were put forward that no feature could be more instrumental in bringing about development in these remote regions than a road, whereas others had the opposite point of view. All depends on the understanding and definition of the term 'development', and this needs further clarification in the case of Nepal.

Looking at Nepal from a regional perspective, most textbooks provide us with an orthographic classification in which we find three ecological zones classifying the country into a high and middle mountain and a Terai zone. The borders between them run more or less parallel to the northern and southern boundaries (Figure 18.5a). This orographic stratification is very often related to development in such a way that new towns and road networks are to be found in the Terai where actual immigration and regional development take place. The densely populated middle mountain or hill region where the traditional urban centres are located is gradually connected to the road network and relieved from population pressure by out-migration. The high mountain region is more or less devoid of urban centres and good roads (Fig 18.5c). Both mountainous regions are losing population because of outward mobility, the migration process leads downhill to the cities. If we apply development indices such as the 'Human Development Index' (HDI)²³ for the districts of Nepal the picture of regional disparities in Nepal is quite different. The HDI is configured by three equal components incorporating the per capita income in Purchasing Power Parity (PPP) in US dollar, the standard of education, and the quality of living standards. For our discussion these aspects are of eminent importance when projected on to high mountain regions. In the case of Nepal such disaggregated data on a district level show an extreme difference between central places such as the Kathmandu basin and remote high mountain districts, such as Mugu, in all respects (Figure 18.5a). While Kathmandu ranks first in the list for Nepal, Mugu district occupies the last position, reflected in a life expectancy of only 37 years and an adult literacy rate of 22%. Separating all districts by regional order, the Middle Mountains of Nepal, including the Kathmandu Basin, fare best with an HDI of 0.421, followed by the Terai lowlands (HDI = 0.389), while the high mountain region as the northern belt remains at the lowest level with an HDI of 0.365 (Figure 18.6). At the district level, the regional

²² The author is grateful to Brot Coburn for his email communication about the recent developments. These can be followed in the Asia-Pacific discussion group of the Mountain Forum (<http://www2.mtnforum.org/mtnforum/index.html>; - View the mf-asia archives)

²³ The Human Development Index (HDI) is constructed of a normative value of the standard of living measured in Purchasing Power Parity (PPP \$), of life expectancy (at birth) value, and of an education index (this is created by giving adult literacy twice the value of school attendance). All three components are embedded in normative formulas to construct a simple and comparable indicator. Countries with low human development are those in which the HDI ranks below 50%. The HDI has been modified several times, the last modification was introduced by UNDP in 1999. See for a regular update the technical instructions in the Human Development Reports and/or the homepage for analytical tools (<http://www.undp.org/undp/hdro/anatools.htm>) (UNDP 1990-1997).



Figures 18.5a & b: Ecological zones and administrative districts of Nepal

inequalities between different ecological zones as well as between individual administrative units can be identified (Figure 18.5b). The capital region commands more facilities and infrastructural assets than any other, while the remote high mountain districts of the western development zone remain at the lowest level. There is a significant east-west and lowland-highland decrease in human development while the urban centres of the capital region, Kaski (Pokhara), and Morang (Biratnagar) in the Terai are exceptions.

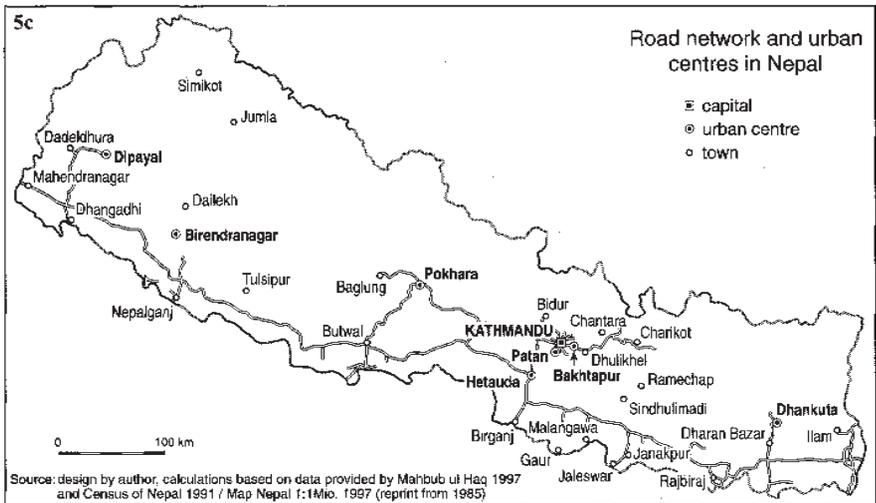


Figure 18.5c: Road network and urban centres in Nepal

Our second case in point stems from the Northern Areas of Pakistan where accessibility has been provided through the Karakoram Highway and where the pace of urbanisation is rapid in the town of Gilgit. Constructing the 'Human Development Index' for the Gilgit District its value is quite low: $HDI = 0.308$ (Figure 18.6). Despite incorporation of this region into a domestic and world market by modern means of transport this area ranks low, because of the income factors especially (UNDP 1999).²⁴ The values for life expectancy and education are somewhat higher and close to the Nepal level. This observation was exactly the reason why different development programmes were introduced into the Northern Areas about two decades ago, and the results show that there is still a long way to go until the region is brought on to a par with the rest of the country (Khan and Khan 1992; Kreutzmann 1993a, b).²⁵

On the contrary, the Indian Himalayan province of Himachal Pradesh ($HDI = 0.447$) resembles the country's average (0.436) which is indicated by a similar HDI value, far above Nepal's average (Figure 18.6) (Mahbub ul Haq 1997). Observers in Himachal Pradesh attribute this development to the accelerated expansion of the road network from the 1960s onwards.²⁶ Anyhow, all countries and all mountain regions within them remain in the 'low human development' category ($HDI < 0.500$).

²⁴ In an international rank list the $HDI = 0.308$ suggests a position among the five poorest countries in the world total of 174 (UNDP 1999). The reference HDI value for Pakistan is 0.442, based on 1994 data (Mahbub ul Haq 1997).

²⁵ The income gap between the mountain areas and the lowlands of Pakistan was the initial justification for development efforts in rural development. The supply of data for the calculations by The Aga Khan Rural Support Programme (AKRSP) is gratefully acknowledged.

²⁶ The author is indebted to Andrew Manzardo for valuable information on Himachal Pradesh.

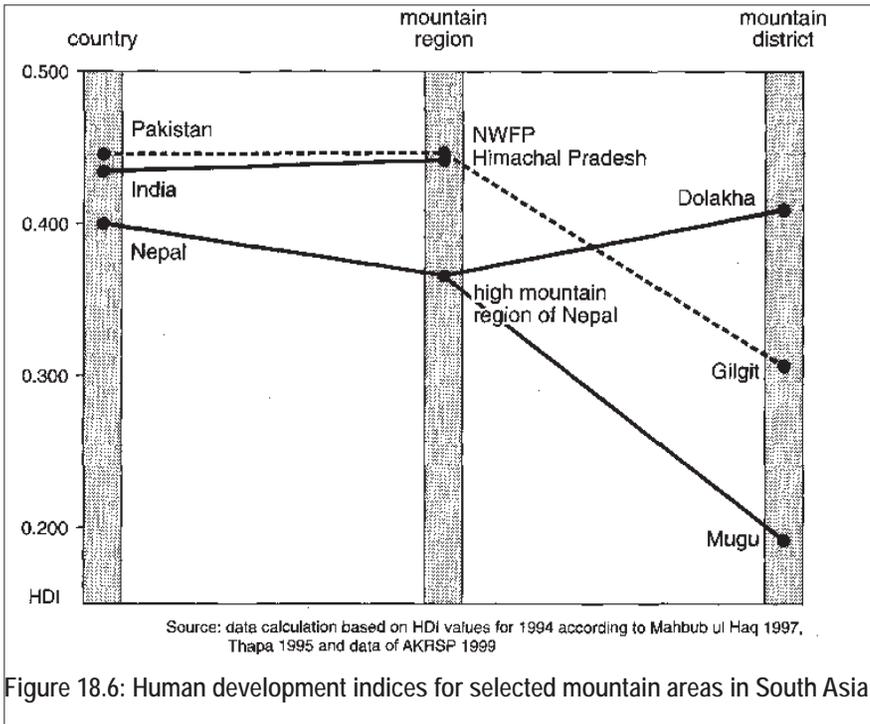


Figure 18.6: Human development indices for selected mountain areas in South Asia

Our discussion reveals that the question of ‘development’ depends on the measures and categories introduced. If accessibility and urbanisation are the indicators selected, the pace of development is intrinsically linked to technological solutions. In addition, other important aspects remain to be taken into account that strongly relate to the socioeconomic living conditions. These parameters are not strongly linked to a place and the permanent residence of mountain farmers and their household members in their villages. We have to take into account that accessibility covers a wider range of facilities and opportunities that can be used in different places. This is especially true when inaccessibility is a marketable resource for tourism and when lightweight commodities such as pashmina wool, herbs, and spices are cash earners; in such circumstances the road link is not of prime importance if the upliftment of living conditions is the main concern.

18.5 Conclusions

Historical evidence from the above discussion points to the fact that a number of motives initiated the construction of major road systems in the South Asian mountains. Development and poverty alleviation do not seem to have been the driving forces. The questions to be raised are: will there be wide-scale road construction in future or will there be a search for other strategies in order to improve living conditions in the

Hindu Kush-Karakoram-Himalayan region? Trans-montane road systems have never been cost efficient from the perspective of regional development when the mountain inhabitants and their economies have to bear the costs of investment and maintenance. The overall interest of a nation-state and/or policy-driven international support could be sufficient to trigger planning and construction of mountain highways. During the Cold War, more funds were allocated for such schemes than ever before or after to date. We must wait and see what the future holds.

A second case in point is that accessibility and urbanisation do not create fool-proof roads to development. It is evident that further inspection of socioeconomic frameworks is required in order to determine the effects of road construction and subsequent changes in settlement structure. Again, the aspect of alternative approaches refuting the simplistic and resource destroying paradigm of modernisation and leading towards the sustainable management of natural and societal resources has to be discussed. Although road access might be of utmost importance from a certain perspective, a realistic approach indicates that this target may not be pursued without considering the given limitations in remote mountain societies.

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