

## TRANSPORT GEOGRAPHY OF NEPAL

Michael Griesbaum<sup>1</sup>

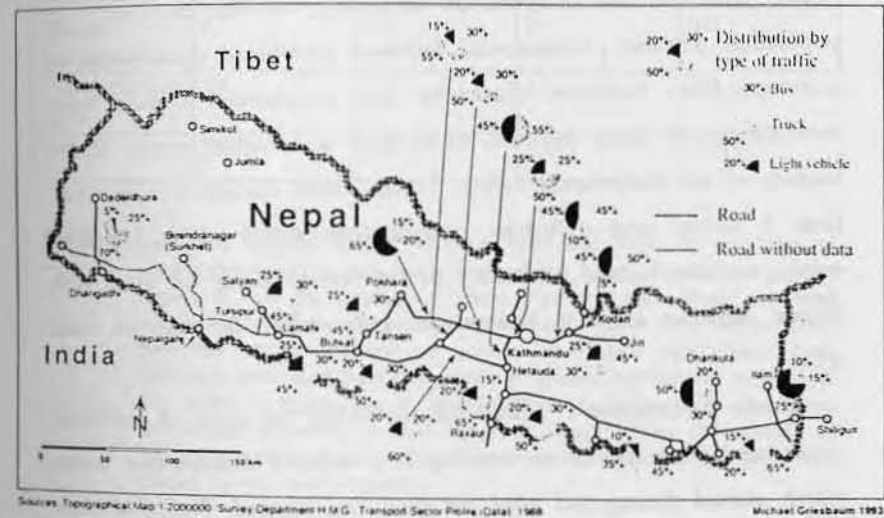
Migration patterns and the transport infrastructure provide the necessary basis for understanding Nepal's situation on the macro level. Out of the transport infrastructure, the road traffic claims far-reaching impacts on the regional organisation that is studied in detail for the area east of Kathmandu up to Jiri.



**Figure 1:** Traffic volumes on Nepal's road network in 1986. Even on the busiest route (Kathmandu - Raxaul), the average daily traffic of 800 vehicles per day looks modest compared to European standards. Road branches such as the one to Jiri, Ilam or Tulsipur are used by less than 50 vehicles per day, often criticised as inadequate usage in comparison to the investments made.

<sup>1</sup> This article is a short summary of my doctoral dissertation submitted to the Departments of Geography, University of Zürich and Tribhuvan University, Kathmandu.

In 1986 the road network provided the best access to the Central Region around Kathmandu, and the East-West Highway in the south stretches over the whole length of Nepal. In contrast, until 1975 only Kodari (border with China), Kathmandu, Pokhara, Butwal and Raxaul (border with India) were interconnected, whereas other important centres such as Biratnagar and Dharan in the south-east were cut off and consequently grew more isolated from the Central Region than after 1986. At present new motor roads preferably into the Mid hills of Nepal, and the case study around Jiri exemplifies the road impacts typical for rural areas in Nepal.



**Figure 2:** Traffic modes on Nepal's road network in 1986. In most cases heavy traffic (trucks, buses) greatly exceeds the share of light vehicles. On some main sections, trucks and buses make up 85 % of total traffic, reflecting a sharp contrast to European standards of generally 10 to 15 %. This has consequences in the difference of axle loads, maintenance tasks and the degree of road uses (one bus in Nepal, e.g., corresponds to a minimum of 30 light vehicles in Europe, with regard to the number of passengers transported).

### Major road impacts:

All the impacts were studied by comparing the situation before and after road construction with the help of aerial photographs, and particularly for rural infrastructure and diversion of main trails the whole hinterland from Kathmandu to Kodari (Arniko Highway) and along the road to Jiri were assessed. The Jiri road was opened about 20 years after the Arniko Highway. The distribution also reflects the growth and industrial development potential.

**Rural infrastructure :** Basic infrastructures such as education and health facilities are distributed according to the demand, i.e. population densities. Commercial facilities (combined occurrences of communication facilities, electricity and commercial banks) were concentrated all along the road while there is a higher density in the vicinity of the Kathmandu valley. Trade centres (locations with more than 5 shops) and industrial centres (enterprises of at least 10 employees) are located preferably in sub-centres along the road with higher densities close to Kathmandu and modest densities in rural areas

**House construction :** Within the Jiri valley the dates of buildings constructed were monitored resulting in a massive construction boom which started during and after the road was opened. Preferred sites were not all along the road but at certain spots such as the end of the road, the crossing of a main trail with the road (a complete new bazaar), a road junction or a bridge.

**Land use changes :** The total catchment area of Sikri and Jiri Khola (3897 hectares) was investigated for the present situation and

28 years ago. The results are :

Land use categories	Area in 1994		Area in 1967	
	hectares	%	hectares	%
Closed forest	876	22.5	65	1.7
Open forest	1120	28.7	1110	28.5
Pasture	939	24.1	1695	43.5
Agricultural land	826	21.2	997	25.6
Open settlement	88	2.2	18	0.5
Dense settlement	9	0.2	0	0.0
Unproductive land	39	1.0	12	0.3
Total	3897	100.0	3897	100.0

**Table 1:** Land use changes in Jiri between 1967 and 1994 on the basis of photo-interpretation and field verification. Most unusual as a road impact is here the increase of forest. Formerly open forest converted into closed forest and pasture into open forest. Thus afforestation prevailed at the expense of pasture and some agricultural land. Although cultivated land decreased, at present agricultural produce in Jiri valley is higher due to intensification measures. Open and dense settlements increased as was observed already from the number of houses constructed. The slight increase of unproductive land was caused by the road alignment.

The land use changes in Jiri cannot be judged as pure road impacts but must be regarded in connection with the forestry sector and other activities of the Integrated Hill Development Project (IHDP). Contrary to the Jiri case, many other areas in Nepal without accompanying measures, such as a forestry component, experience

deforestation as soon as there is better access to the forest (e.g. in the Terai along the East-West Highway or the left bank of Trisuli between Mugling and Narayangadh).

*Economic changes* have taken place from a traditional subsistence farming system to a system mixed with a monetary economy based on project cash inflows, tourism being below any expectations nowadays because of air services directly to the Mt. Everest region, cash crops and strengthening of local markets (INFRAS 1993). Awareness building, an accelerated diffusion of innovations, faster behavioural changes and a transformed economy have developed hand in hand with and due to a strong impetus from the road. Caused by a scarcity of fire wood, kerosene as an alternative resource from outside reached a more competitive position with road transportation and became a strong substitute. Likewise, the use of Chinese thermos cans and Indian pressure cookers in recent years gained wide popularity that helped to reduce energy consumption drastically.

*Diversion of main trails:* A comparison of the one inch to one mile maps from 1955 with the Main Trail Maps from 1989 gives evidence that the former general pattern was preferably a north-south direction with traditional trade routes between Tibet and the southern hills of Nepal (the Terai belt was a barrier because of malaria). The road often has replaced sections of former main trail alignments. With the primary orientation of the road network towards Kathmandu the capital became more important, subsequently its area of influence grew. Also the importance of regional centres increased, finally resulting in a new main trail network which interconnects road heads, district headquarters and other important regional centres or

clusters of various medium-sized centres (Griesbaum 1985).

### *Conclusions for road planners:*

Road planning in an ecologically vulnerable region such as Nepal asks for special attention to integrative transportation concepts by considering predictable impacts on regional organisation, land use changes, bioengineering methods, sociology and economy.

Improvements within the whole transportation management cycle are needed, i.e. planning, implementation and review. The proper tool box for road planners consists of network master plans, inventory studies, maps, aerial photographs, satellite images, a data bank, feasibility studies, the impact matrix method, a choice of project alternatives and their ranking, geographic means for enhancement of map bases and statistical data, models and construction principles, implementation and maintenance plans, evaluations.

Planners have to be aware of typical impacts experienced in the past and must react with countermeasures. Trends, as much as they can be forecast, are important elements to predict the regional development under the influence of a new project. In the case of the Jiri road, initially, it was a serious planning mistake not to connect the traditional centre and the headquarters of the Dolakha District, Dolokha with the road. It resulted in a massive movement of the market and administration to Charikot, the next roadhead. Even after an access road to Dolakha was constructed with local initiative, and even though the economic exodus somehow could be reversed again in favour of Dolakha, the previously induced damage was irreparable.

**References:**

**Asian Development Bank**

1988, *Transport Sector Profile Study. Final Report.* Kathmandu, TECNECON/ Scott Wilson Kirkpatrick/ East Consult.

**Griesbaum, M.**

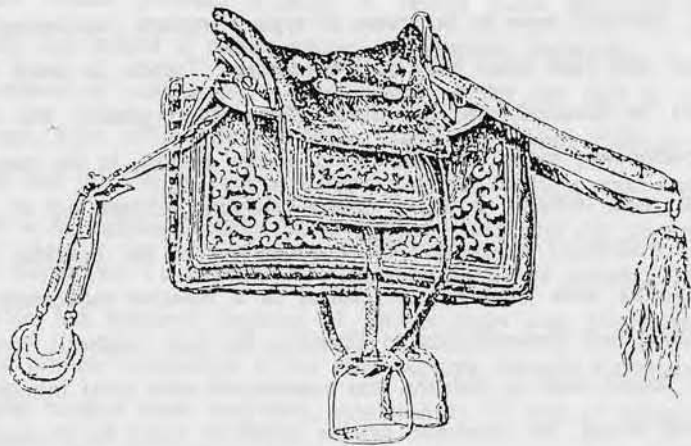
1985, *Trail Selection for Suspension Bridges in Nepal.* Suspension Bridge Division, Kathmandu and NADEL, Swiss Federal Institute of Technology, Zürich.

**INFRAS**

1993, *Rural-Urban Interlinkages.* Zürich, INFRAS AG.

**Schmid, R., Hartmann, A., Zemp, R.**

1971, *Road Feasibility Study of the Tama Kosi/ Khimti Khola Area.* Kathmandu, SATA.



András Höfer, *A Recitation of the Tamang Shaman in Nepal*, Bonn, VGH Wissenschaftsverlag, 1994, 379 p., bibl., index, ill.

Article review by Brigitte Steinmann.

A. Höfer gives us the second sorting tray of his shamanic recitals, recorded in the seventies, among the Tamang of Dhading district. This is an important and expensive volume of 379 pages, presented in three parts: the concepts, ritual techniques and language of the bompo; the text of the recitation; and the analysis of "symbol-construction". I shall deal here mainly with the second part of the book, i. e. the transcription and translation of the Tamang songs, although we shall see that all the book is concerned with this second part.<sup>1</sup>

Last November, while I was walking in the (Eastern) hills of the Tamang Temal area with one of my Tamang companions, Thubten Gyalcen Lama, a Tamang rnying-ma-pa monk living in Sailung, Thubten aroused my curiosity while immersing himself, at each halting-place, in a number of photocopied pages of an English book. Glancing over his shoulder, I realised that he was patiently trying to read and to understand a chapter of the last book of A. Höfer, which was not yet available in the bookshops. I knew that Thubten had a vast international net of information about westerners deeds and words, and I proposed to help him as I could in this

<sup>1</sup> I keep A. Höfer's Pelliot transcription for the Tibetan terms quoted, and in my own notes I adopt the Wylie transcription. Nepali is transcribed according to Turner's Dictionary. TG refers to Thubten Gyalcen.