Day Two

Technical Session Three

Chairperson
Mr. Devendra Amatya

THE MENRIS TAPLEJUNG DATABASE

P.K. MOOL

In 1990, the International Centre for Integrated Mountain Development (ICIMOD) established the Mountain Environment and Natural Resources' Information Service (MENRIS) as a resource centre for the HKH (Hindu Kush-Himalayas) region for the study and application of GIS (Geographic Information Systems) technology. The objectives of MENRIS are given below.

To improve environmental and natural resource management and promote sustainable economic growth in mountainous countries, by facilitating solutions to common problems and ensuring the communication of results on a compatible GIS platform.

To assist in the promotion of information exchange between interested participating countries of the HKH Region, using GIS technology, and to act as a clearing house for existing knowledge in mountain resource management for agencies involved in mountain development.

MENRIS principally emphasises (i) the establishment of in-house GIS and Remote-sensing (RS) facilities; (ii) training and capacity building for the application of GIS/RS to natural resources' management in each of the regional member countries, including the establishment of national GIS facilities; (iii) establishment of a digital HKH database; (iv) networking in member countries within the Region and sub-region; and (v)computer application and development.

MENRIS is a catalyst in an effort to construct GIS databases with national collaborating institutions. More often, data are dispersed among the institutions, and the conservative approach to information sharing in the Region presents further challenges to the development of a GIS database. Defining common standards for a database on sub-national/national and regional scales has been the first step towards collection and dissemination.

MENRIS has carried out the compilation of a national-level database containing socioeconomic and natural resources' data for Nepal on a scale of 1:250,000 in Arc/Info software. Some

Area,	3,646sq.km.
Population,	(1991) 120,053
Male Population,	58,774
Female Population,	61,279
Population Density,	32.93 person per sq.km
Number of Households,	21,370
Average Household Size,	5.62
Population in 1981,	120,780
Per Cent Population Change,	0.601 per cent (negative)
Total Economically Active Population,	52,748 (43.94%)
Males, 27,440	(22.86%)
Females, 25,308	(21.08%)
Ratio of Dependent Population (<15 - >60) and Non-Dependent Population (15 -59), 0.57	
Average Population Per Health Post,	13,341
Land Use	
Grasslands	30,451ha
Forests	99,623ha
Shrubs	39,544ha
Other	153,305ha
Agriculture	
Irrigated Area,	7,119ha
Total Cultivated Area,	27,533ha
Avg. No of Cows/ Buffaloes Per Household,	4.94
Avg. No. of Small Animals (Sheep/Goat) Per Household,	3.14
Avg. No. of Poultry Per Household,	4.99
Education	
Percentage of Total Literate Population	45.95
Males,	30.29
Females,	15.67

information on the Taplejung district from the Nepal database is given in the chart above.

Besides this, information on physiography, climate, ecological regions, remote sensing data, etc is available on the database.

Presentation of Maps

Mr. Mool presented maps on the various indicators for Taplejung.

Discussion

Answering the questions raised about the potential dangers to lakes in China, India, and Nepal, Mr. Mool said that looking at the satellite images there were comparatively less dangerous lakes on the Sikkim side, but there was no field data information. In Bhutan, there was a flood three years previously and similar occurrences of such phenomena in Kanchanjunga were very high. He also mentioned that the digital information available at MENRIS was open to the public also.

Mr. Javed Hussain, WWW Representative, Thailand, enquired what Mr. Mool would have done if he had to monitor the proposed Kanchanjunga transboundary area. What would be the frequency needed to monitor it on a regional scale and what would be the financial resources required to do that

job? He further asked how effective GIS and remote-sensing technologies were for developing, monitoring, and managing such an area?

Mr. Mool said that first it was necessary to develop a database of the whole Kanchanjunga area. Following which, topographical information, such as the contour lines, was required. This was just the basic information that was needed. Since all the detailed topographical maps were not available at the moment because of government policies in the three countries, a digital terrain model using stereo satellite images could be made. Indian, French, Japanese, and American satellites were capable of doing this, but it would be expensive. One frame of stereo capability satellite image covering approximately 60-80sq.km. would cost about US$ 4,000. Indian satellite rates were subsidised for their own institutes and the charges were only Rs[6] 4,000. But, for institutions like ICIMOD, the rates were very high. Mr. Mool added that, at the moment, the most commercial and easily available satellites were French and American satellites. So topographical mapping, vegetation monitoring, and even habitat mapping could be carried out. But, apart from some places in China, there was no habitat mapping for wildlife and forest species or for monitoring the vegetation cover.

Mr. Bijaya Kattel, Department of National Parks and Wildlife Conservation, asked what the intervals should be for vegetation monitoring.

Mr. Mool replied that botanists and vegetation people should be consulted about the optimum season to map the different types of species. Actually monsoon or just before monsoon might be a good time.

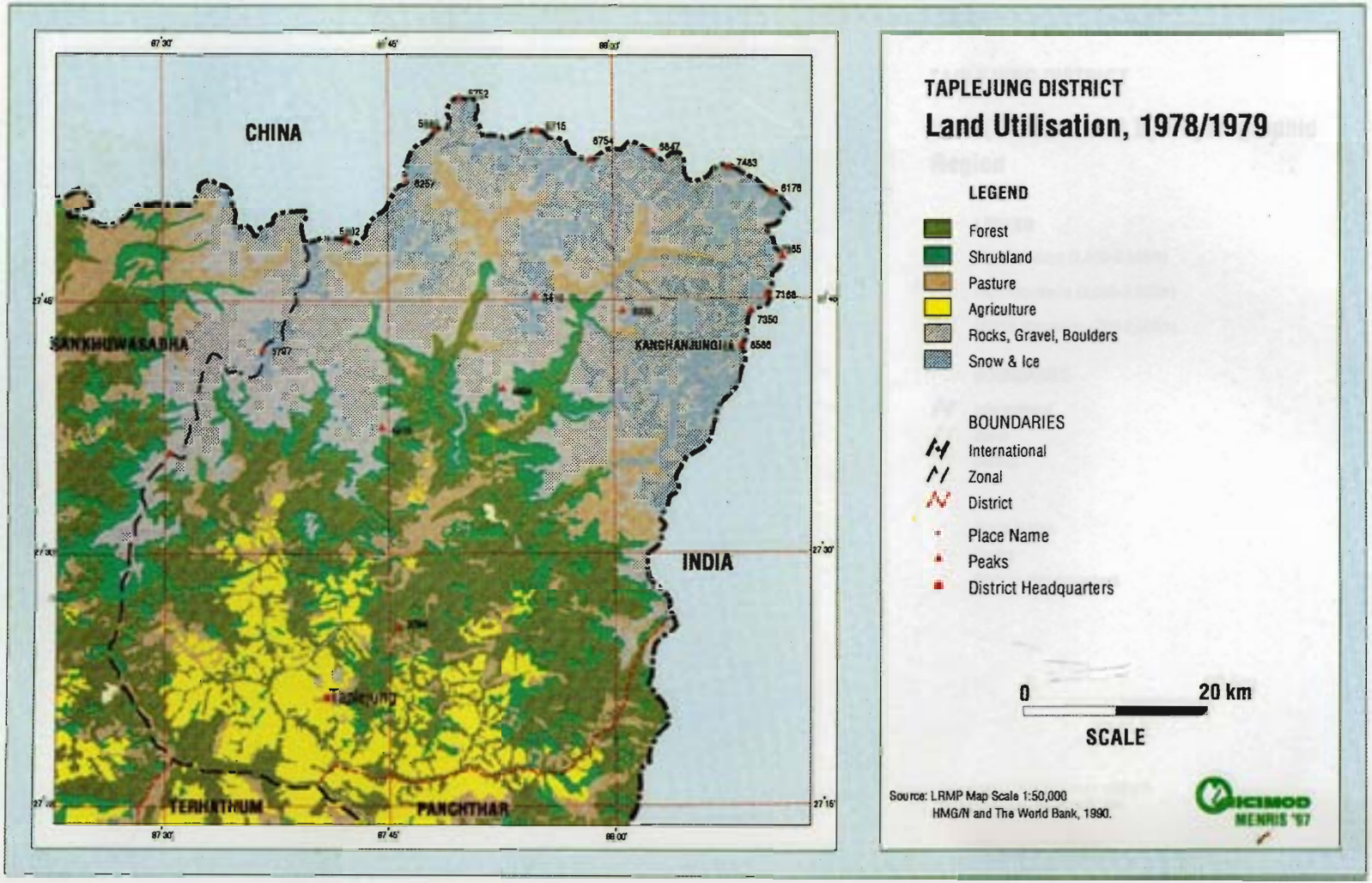
Mr. Devendra Amatya, WWF, Nepal Programme questioned Mr. Mool about how long he had been monitoring lake outbursts and the way he collected remote-sensing data.

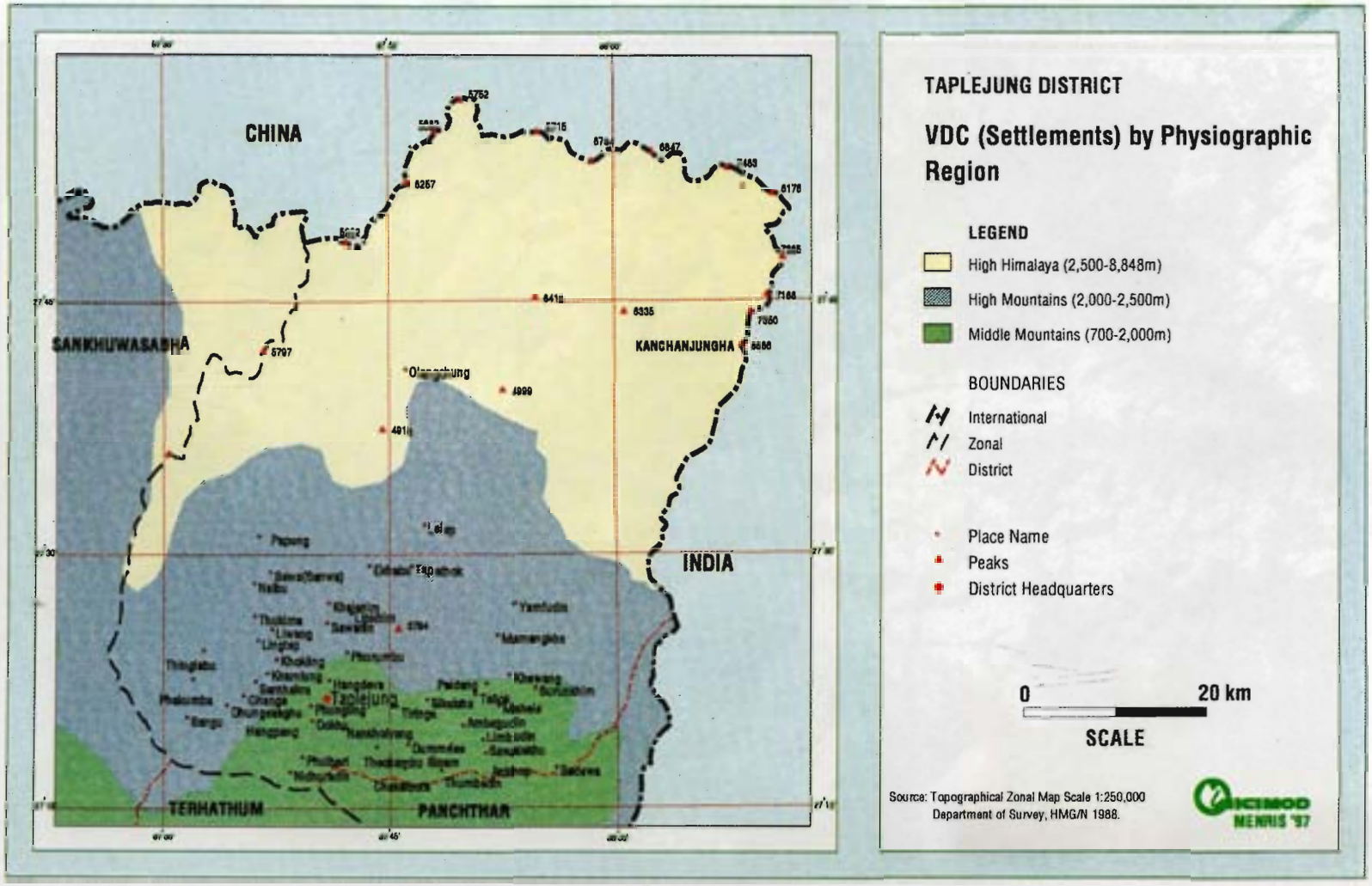
Mr. Mool replied that he had been monitoring glacial lakes since 1985 and since all the glacial lakes are in the restricted zone of Nepal, it was only possible to monitor them through satellite imaging. Even with 80km resolution, the small-sized lakes could be recognised. So an inventory map was made and some funds collected to arrange a fly over. Because of the restrictions, the aerial image of the high mountains could not be acquired. The best way was to hire a Pilatus Porter aircraft and to use a motorised ordinary camera to take photographs. That was how it was done. The next step after that was to go to the field, which was a very expensive exercise.

Mr. Devendra Rana of WWF-I, Switzerland wanted to know which institution Mr. Mool would collaborate with in the TAR (Tibetan Autonomous Region) of China for GIS information, as for example, the G.B. Pant Institute in Sikkim area.

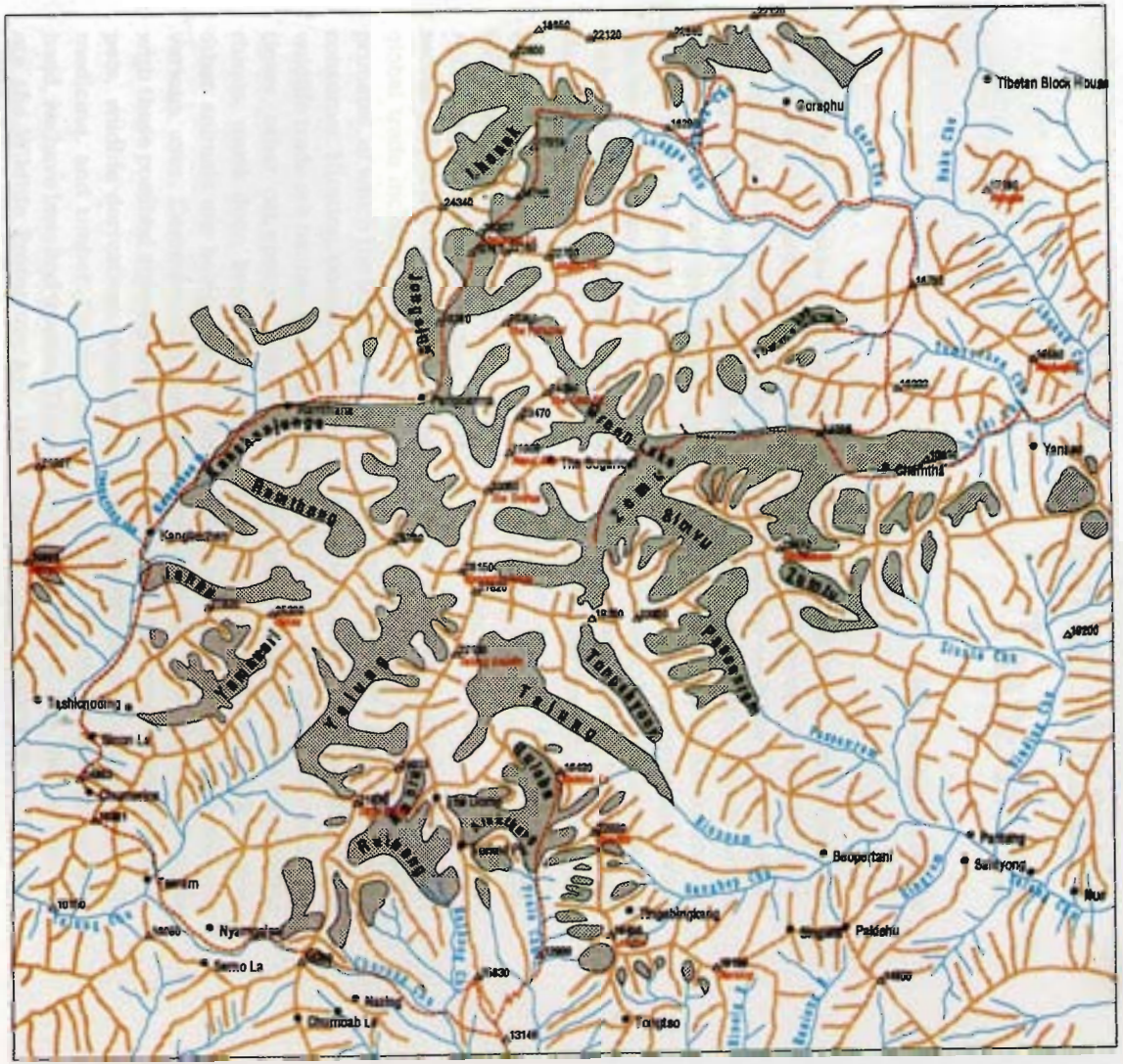
Mr. Mool replied that there was a collaboration programme with Beijing on an official basis. He further added that even right now their experts were in Lhasa with GIS equipment and were conducting training on installation of the equipment.

[6] There are 35.50 Indian rupees to the U.S. dollar


TAPLEJUNG DISTRICT
Land Utilisation, 1978/1979
LEGEND
Forest
Shrubland
Pasture
Agriculture
Rocks, Gravel, Boulders
Snow & Ice
BOUNDARIES
International
Zonal
District
Place Name
Peaks
District Headquarters
0
20 km
SCALE
Source: LRMP Map Scale 1:50,000
HMG/N and The World Bank, 1990.
CHINA
INDIA
SANKHUWASABHA
KANCHANJUNGA
TERHATHUM
PANCHTHAR
Taplejung
ICIMOD
MENRIS '97


CHINA
SANKHUWASABHA
KANCHANJUNGHA
INDIA
TERHATHUM
PANCHTHAR
Taplejung
TAPLEJUNG DISTRICT
VDC (Settlements) by Physiographic Region
LEGEND
High Himalaya (2,500-8,848m)
High Mountains (2,000-2,500m)
Middle Mountains (700-2,000m)
BOUNDARIES
International
Zonal
District
Place Name
Peaks
District Headquarters
0
20 km
SCALE
Source: Topographical Zonal Map Scale 1:250,000
Department of Survey, HMG/N 1988.
ICIMOD
MENRIS '97

KANCHANJANGHA



THE GLACIERS OF KANCHANJANGHA

Legend

- Ridge
- River
- Route
- Spot Height (in ft.)
- Glacier

0 5 10 15 kms

Scale

In: ROUND KANGCHENJUNGA:

A narrative of Mountain Travel and Exploration;
by Douglas W.Freshfield with an introduction to the 1979 edition by Harka B. Gurung;
Ratna Pustak Bhandar,Kathmandu, Nepal. 1979

First Published 1903
Re-Published 1979