CHAPTER I

I N T R O D U C T I O N

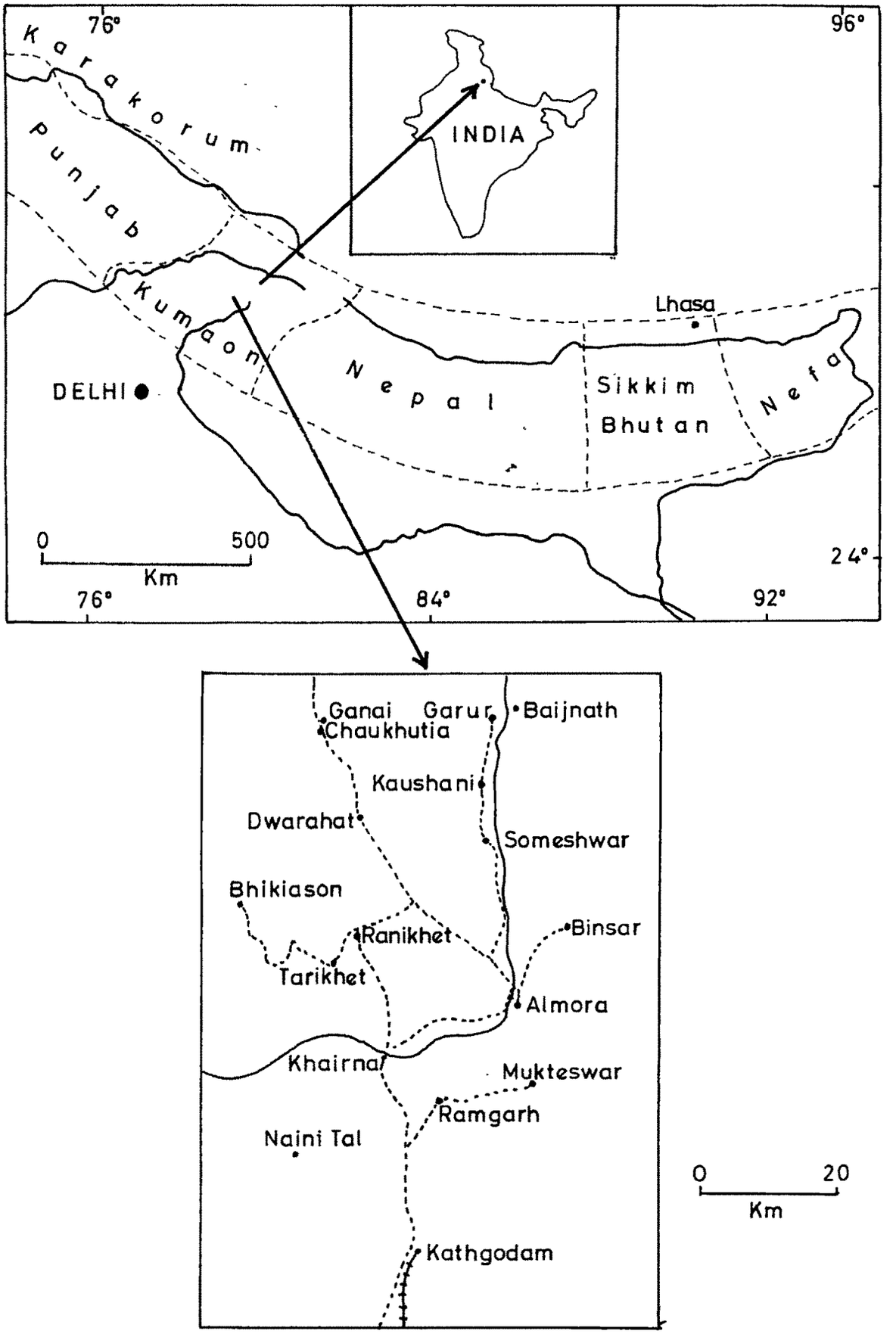
THE STUDY AREA

Location

The thesis incorporates the results of a detailed geological investigation of the rocks around the villages Ganai and Chaukhutia (Fig. 1.1). These villages are situated in a NNW direction from Ranikhet at distance of nearly 55 km by road. The study pertains to an area of about 130 sq km enclosed by the E. longitudes 79°18' and 79°27', and N. latitudes 29°51' and 29°57'.

Fig. 1.1

LOCATION MAP



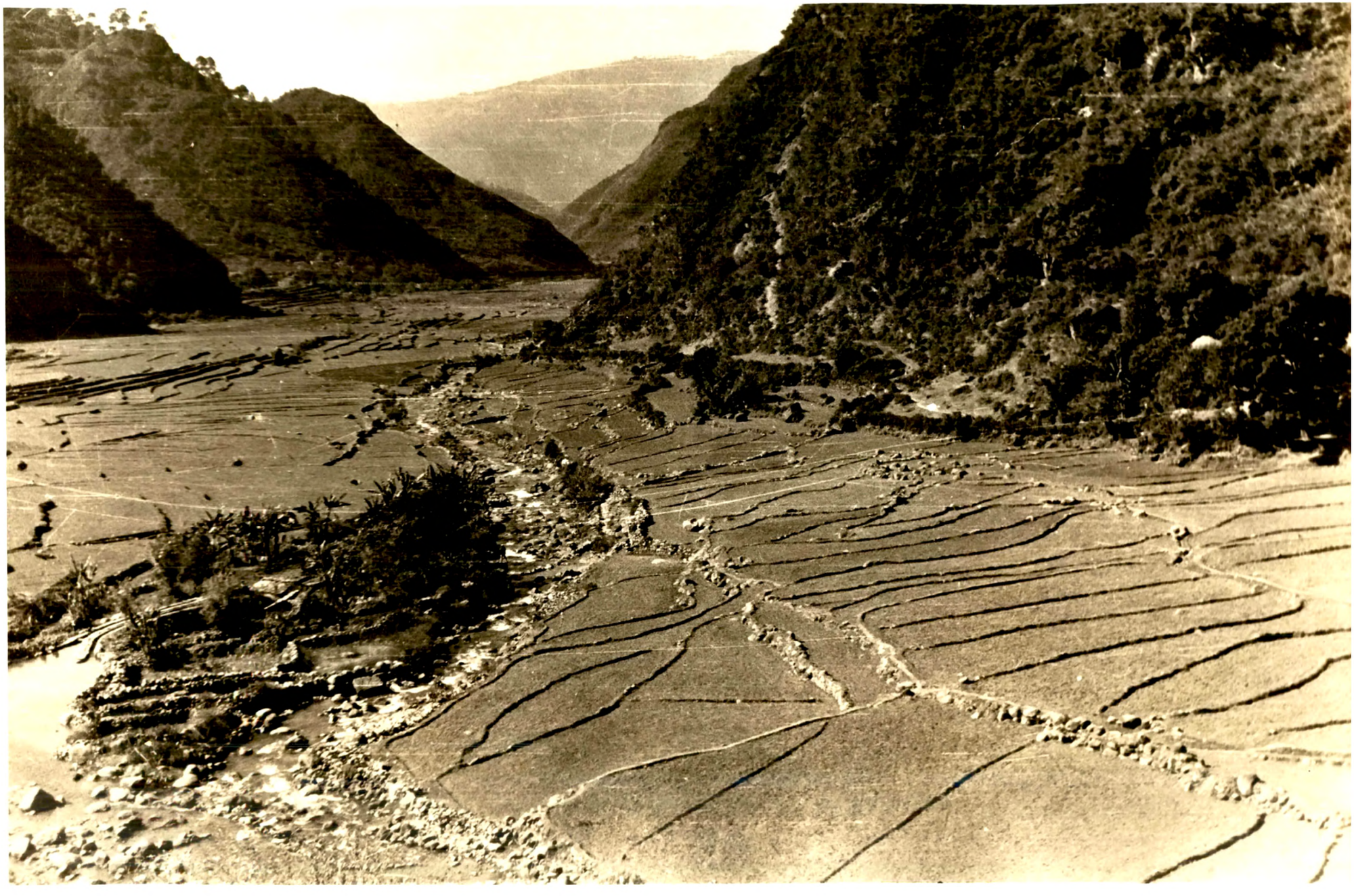
Physiography and Drainage

Physiographically, the study area which exhibits a typically rugged topography forms a part of the Nag Tibba range of the lesser Himalaya. The physiographic features of the area are structurally and lithologically controlled, and include such features as broad valleys, low hills, escarpments, gorges, nallas and rivers. The south-eastern portion of the area is the highest, approaching about 2100 m in altitude. In general, both the northern and southern parts of the area are relatively high grounds, which slope down, towards the river Ramganga that flows from NE to SW, almost along the middle of the area. The heights of the ground in the south vary from 1065 m to 2115 m, while the northern ground does not exceed 1720 m in height. The town Chaukhutia itself is situated on a flat broad ground showing a height of 915 m. The ground rises abruptly towards east from Chaukhutia. The Khastari river that flows almost southward and meets the Ramganga at Chaukhutia also forms a broad valley and dissects the northern high ground into two parts (Plate 1.1).

The drainage pattern of the area is mainly of consequent type and is controlled by the topography, structure and tectonics of the region. The river

PLATE 1.1

Panoramic view of Ganai-Chaukhutia valley looking north from the Chaukhutia P.W.D. Dak Bangalow.



Ramganga is the main and principal drainage of the area and is seen to follow a major fault line. The Khastari Gadhera also flows along a fault. Other important tributaries of Ramganga draining the Chaukhutia area are Nagar-Nala, Kalron-Nala, flowing almost from N to S, meeting Ramganga at Karchuli. All these streams are perenial and in turn, are fed by an intricate network of numerous seasonal smaller nalas.

Climate and Rainfall

The climate of the area is always very pleasant and healthy. The average temperatures are 35°C during summer (April-June) and 5°C during winter (November-January). The monsoon breaks earlier than the plains by westerly winds which commences from June. The area receives about 1500 to 1800 mm of rainfall annually.

Flora

There is a variation in vegetation according to the altitude. Sal (Shoven robusta), Sain (Terminalin tomentosa), Tun (Ecdrelatoona) etc. are found up to the elevation of 1524 m. Beyond this altitude, Chir (Finus longifolia) and Oak (Quercus incana) commonly grow. At lower altitude, grow the bhuynul, pipal, banayan, bamboo,

shisham etc. Besides these, the fruit trees of many description are grown among which apricot, citrous fruits, strawberry, black-berry, and orange etc. are common.

Fauna

The wild animals of the region are leopards, panthers and black bears. Amongst others are pigs, jackals and spotted deers. The common domesticated animals are ponies, goats, bullocks and dogs. Birds show wide range of varieties. Fish are abundant in the flowing river.

Habitation

The people of the area are mostly Hindus, though Christians and Muslims also form sizable numbers. The two thirds of the people speak the local Kumaonee dialect and one third Hindi, Hindustani or Urdu.

Communication

Chaukhutia is connected with the nearest hill station Ranikhet by all weather motorable road. This road further south connects the nearest railway station Kathgodam which is at a distance of about 88 km. Further north, a good motorable road connects Chaukhutia to many places as far as Badrinath.

SCOPE OF INVESTIGATION

The author was introduced by Professor S.S. Merh to the area in the winter of the year 1971 and since then he has spent a total of about 20 weeks in the field, during the winter months of 1971 and the summer and winter months of the years 1972 and 1973. The mapping was carried out on a scale 1:15840, photographically enlarged from the original one inch Survey of India toposheet No. 53 O/5.

Geologically, the area required thorough reinvestigations to unfold its structural and stratigraphic complexities.

The author visited all accessible parts of the area and collected samples and structural data. Carefully planned traverses and tracing of the exposures of various rock types, enabled the author to prepare a fairly detailed geological map, that reveals not only the distribution and extent of various formation, but also shows the structural pattern very well (Fig. 1.2 & Fig. 1.3).

The author examined all his samples critically in the laboratory, and this study has thrown much light on the petrology of the different rock types. In addition

to their petrographic studies, he also analysed chemically a number of samples of chlorite schists to establish their spilitic nature. A few samples of dolomitic limestones were investigated with the help of X-Ray diffractometer (Localities shown on Fig. 1.3).

This investigation in the Chaukhutia area by the author comprises a part of the bigger programme of detailed mapping of the Central Kumaon Himalaya by Professor S.S. Merh and his students of the M.S. University of Baroda. The results that are included in this thesis reveal interesting stratigraphic and structural details hitherto unknown.