

CHAPTER I

INTRODUCTION



General

Medium-grade metamorphic rocks of amphibolite facies which form the complex basements are widely regarded as inferred Precambrian rocks in Thailand. They usually formed the core of the N- to NW- trending anticlinorium and faulted belts in the north, west, eastern Gulf and peninsular Thailand (Buam et al., 1970; Campbell, 1977; Piyasin, 1975; Nakinbodee et al., 1977; Bunopas, 1982; Pongsapich et al., 1983 and Nakapadungrat et al., 1987).

The Precambrian age was frequently inferred from stratigraphic position as well as their rather high grade of metamorphism. The boundaries between the inferred Precambrian rocks and the younger, less deformed Paleozoic rocks are not clear and sometimes are faulted (Baum et al., 1970 and Pongsapich et al., 1983). At present, there are no isotope data to verify the absolute age of these rocks.

Objectives

With the above-mentioned backgrounds, the Khanom area was chosen for this study with the co-operative assistance by Geological Survey Division, Department of Mineral Resources.

The objectives of this study are :

1. to map geologically the Khanom Gneissic Complex at a scale of 1:50,000.
2. to determine stratigraphy, structure and metamorphism of the individual rock units.

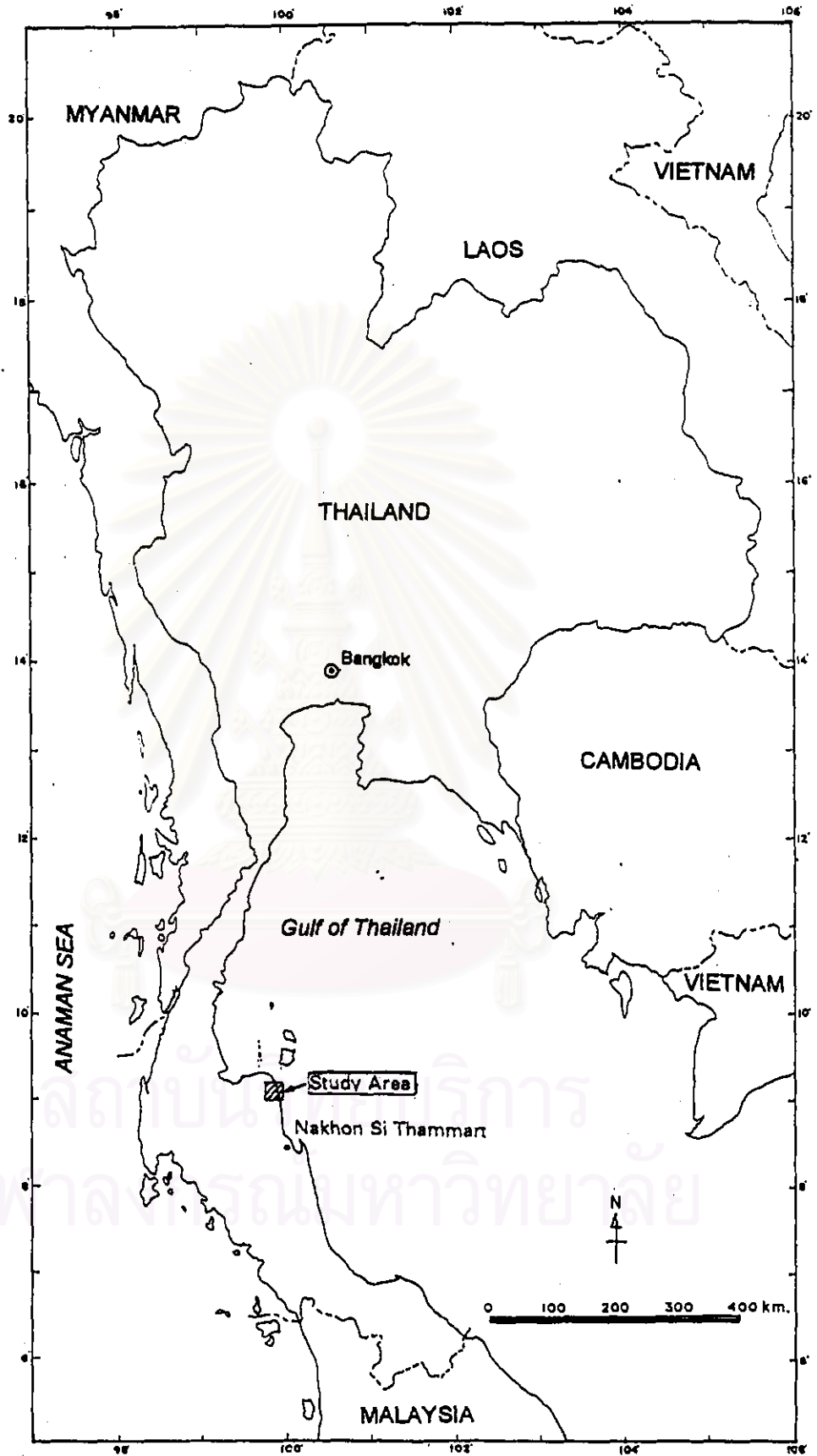


Figure 1.1. Index map of Thailand showing location of the study area in Khanom district, Nakhon Si Thammarat province.

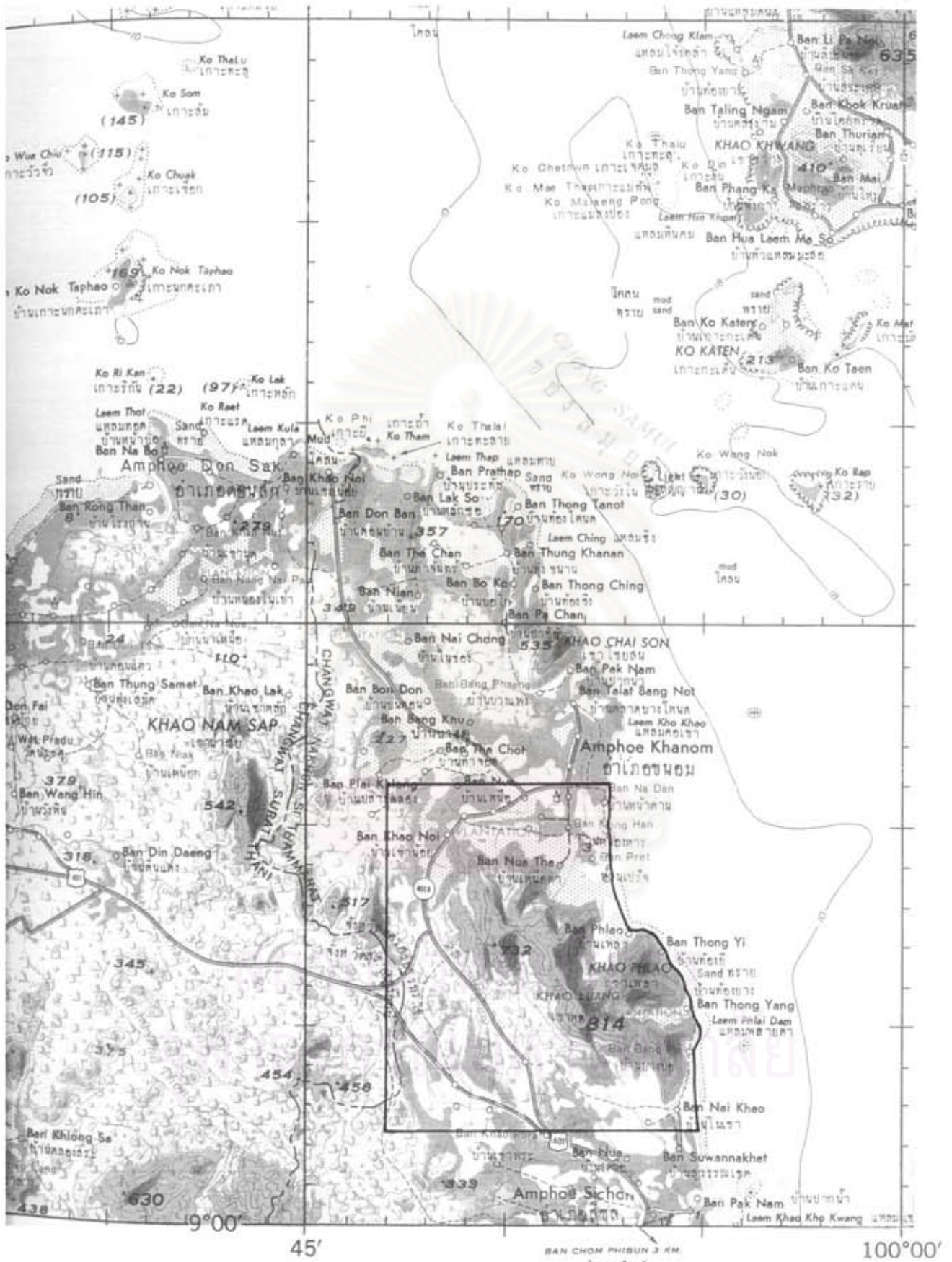


Figure 1.2. Topographic map showing the location of study area, scale 1:250,000, sheet Changwat Surat Thani.

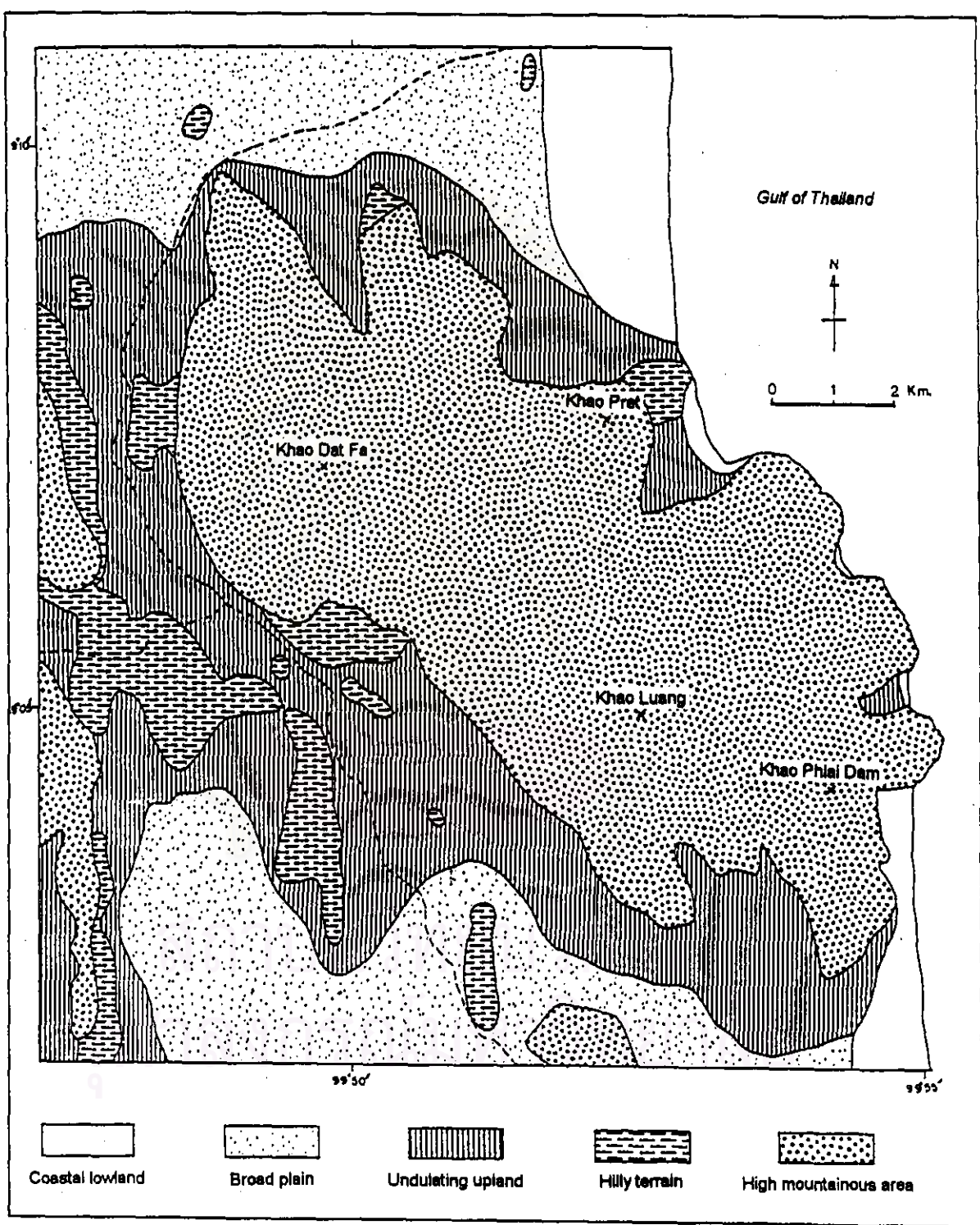


Figure 1.3. Index map of the Khanom area showing main physiography of the region.

3. to determine petrographic and geochemical characteristics of various units related to their origin.

Location and Accessibility

The study area is located in Khanom district, Nakhon Si Thammarat province, southern Thailand, on the western coast of the Gulf of Thailand (Figure 1.1). It covers on an area of approximately 225 square kilometers, bounded by the geographic latitudes 9° 02' and 9° 43' north and the longitudes 99° 16' and 99° 56' east, and on the topography map sheet 4927 II, Amphoe Khanom quadrangle on a scale of 1:50,000.

It can be accessed by a highway road number 4 from Bangkok to Changwat Chumphon, then take highway number 41 to Amphoe Phun Phin, Changwat Surat Thani, and turn eastward to the highway number 401 via Amphoe Muang and Amphoe Kanchanadit, Changwat Surat Thani to Amphoe Khanom, Changwat Nakhon Si Thammarat. It is approximately 780 kilometers from Bangkok and takes about 14 hours by train. The shortest route from Bangkok to Surat Thani is by plane, is about 55 minutes by domestic airlines.

Physiography

The Khanom area which is situated in the central peninsular Thailand illustrated as one of the important coastal features of the Gulf of Thailand. The erosional process is more significant than the depositional processes for controlling the rolling landscape. The general morphology of the area can be simply divided into five topographic terrains; namely, the high mountainous area, the hilly terrain, the undulating upland, the broad plain and the coastal lowland (Figure 1.3). The high mountainous area are situated on the central portion of the map, covering approximately a half of the whole study area (50%). They commonly form the main range with northwest - southeast trend, such as Khao Yoi, Khao Pret, Khao Phlao,

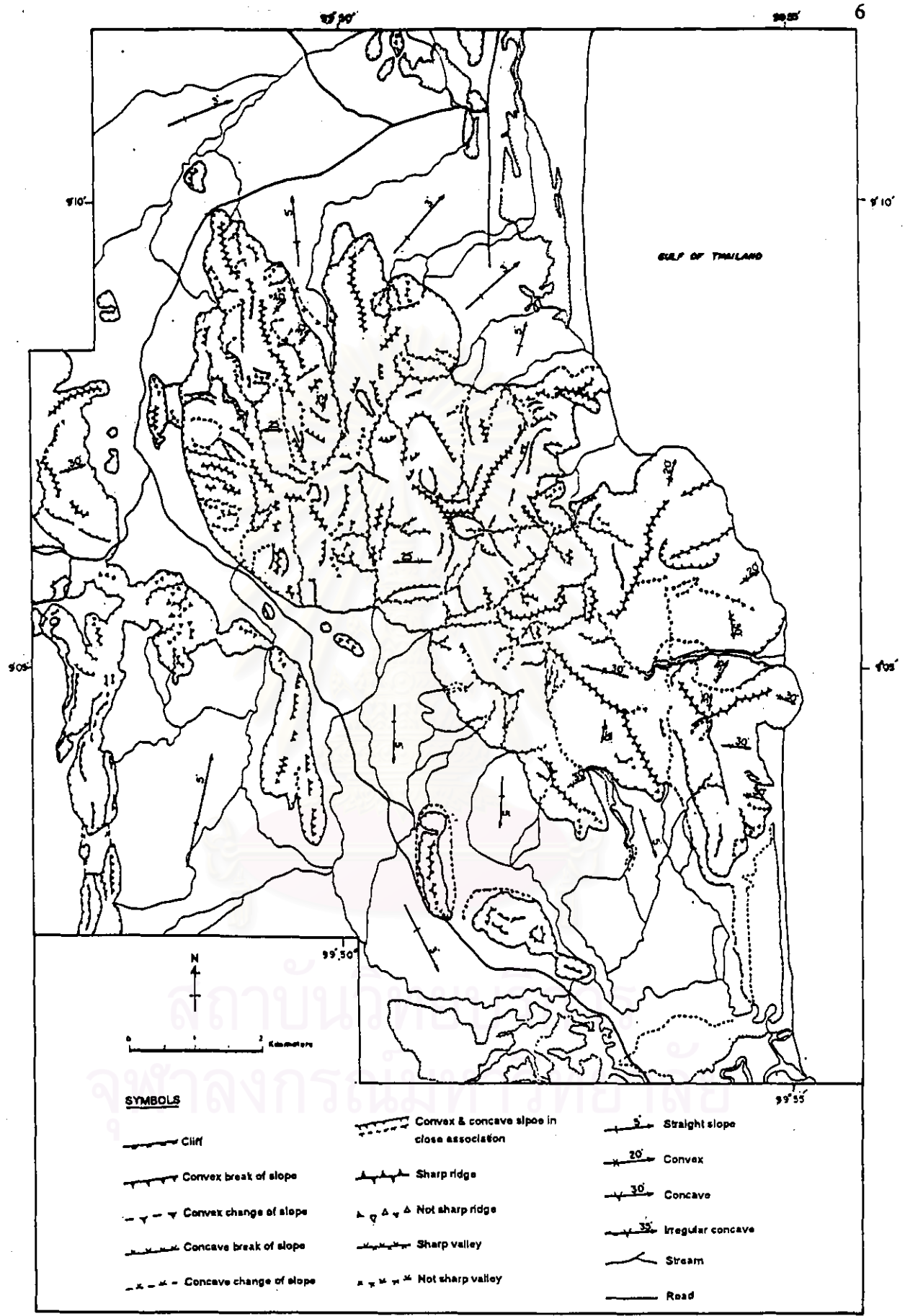


Figure 1.4. Index map of the Khanom area showing principal geomorphology of the study area.

Khao Phlai Dam, Khao Pluai Mai. The main peak mountain is Khao Dat Fa that is about 732 meters above mean sea level (msl), the highest peak is Khao Luang that is about 814 meters msl. The north-trending mountains occur mostly in the western part of the study area such as Khao Hua Chang and Khao Chang Sam. The geomorphologic feature of this terrain is strongly dissected with a high degree of relief (Figure 1.4).

The hilly terrains are recognized by the elongate and isolated hills in a north-south trend, covering about 30 percent of the study area. Other diagnostic features, such as karst topography, are also outstandingly observed; i.e., Khao Fai, Khao Lak, Khao Leung, Khao Pon, Khao Noi and Khao Wat, whose elevations vary considerably from 50 to 300 meters msl.

The undulating uplands occupy the area between or almost surrounding the north-south trending mountain and northwest-southeast main ranges, which are more prominent in the west and the central parts of the area. The average elevation is approximately 30 to 50 meters msl. The region forms undulating and rolling ground surface with some flat top terrain, and is dissected by stream valley. They cover the total area of about 20 percent.

The broad plains of alluviums and swamps appear in the northernmost and the southwestern parts of the whole area. In this part, the topographic contour not more than 30 meters msl. They laterally extend with gentle slopes of about 3 to 5 degrees. They occupy an area of approximately 15 percent of the total area concerned.

The last part, the coastal lowland, occurs as a narrow elongated north-south trending landform, following the shore line and becoming small pockets between the rocky cliffs in the eastern side of the main ranges. Where features look like raised beaches with sand dunes form, beach barrier developed and the depositional features like lagoon are observed.

In the main range terrain, the major drainage systems (Figure 1.4) are characterized by sub-dendritic and parallel patterns, all of which flow approximately north-south and east-west trending. There is a small permanent stream and several short streams which are mainly intermittent. Most of the streams discharge eastward to the Gulf of Thailand.

The Khanom area is in a climate of the tropical monsoon type. For the most part, the climate is rather hot and moisture, the temperature varies from 21° C to 36° C. The temperature is usually quite high during the daytime. February to April is the hottest season, while May to January is the rainy season. The annual precipitation is about 700 to 800 millimeters, because of the influence south-west and north-east tropical monsoons.

Previous Work on the Study Area

Geological investigations in Khanom area begun with the preliminary investigation by the Department of Mineral Resources team led by Nakinbodee (1985), who mapped the sheet Changwat Surat Thani at the scale of 1:250,000. Outcrops of gneiss and schist exposed in Khao Dat Fa area, southern part of Amphoe Khanom, were mapped as inferred Precambrian rocks.

Chaimanee (1992) has presented Quaternary geological map of Khanom Quadrangle at the scale of 1:50,000. The Quaternary deposits mapped comprise colluvial, residual, intertidal and fluvial sediments covering the lowlands and shorelines.

In 1993, detailed stratigraphy and character of Permian to Carboniferous rocks of northern Nakhon Si Thammarat were studied systematically by Lumjuan (1993), providing a new evidence for age determination and a better understanding of the Upper Paleozoic sequences.

Raksaskulwong and Wongwanich (1994) very recently reported a detailed stratigraphy of the Kaeng Krachan Group in western and peninsular Thailand (Tanaosri and Khao Luang, respectively). They found index fossils at both areas, and concluded that the Kaeng Krachan Group continues its distribution from Tanaosri to Khao Luang mountain ranges, suggesting rocks of the Kaeng Krachan Group may have extended far eastward and perhaps across the Klong Marui fault.



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