CHAPTER II

GEOMORPHOLOGY
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GEOMORPHOLOGY OF THE STUDY AREA

2.1 INTRODUCTION

Geomorphology relates to the study of landforms for their genetic, dynamic, and static aspects. The landforms of today are essentially the product of different geomorphic processes such as erosion, deposition, crustal movement and climatic changes. The terrain is the result of a combination of different landforms, which evolved as a result of prolonged geological and geomorphic processes. Various geomorphic units have been studied by the author using field observations.

In addition to the field investigation, aerial photos and satellite imageries (IRS-I-A and LISS-I) pertaining to Kadayampatti area were studied. Stereoscope was used for observing the landforms, rock types, folds, faults, fractures and their relation with one another using seven basic characteristics like shape, size, pattern, shadow, tone, texture and size. Lithological boundaries as observed in aerial photos were checked during the field investigation. Satellite imageries were used by the author to locate geomorphological features, major lineaments, stream pattern, fault pattern and water bodies etc.,
2.2 GEOGRAPHICAL SETTINGS

In order to facilitate description, the Kadayampatti area can be conveniently classified into four divisions (Fig 6). They are:

1. Northern hilly region
2. Central plain region and
3. Southern region.

2.2.1. NORTHERN HILLY REGION

This northern hilly region (Plate 1. Fig.1 and Plate 1 Fig.2) mainly consists of two reserved forest areas, namely.

1. Manukondamalai reserved forest area (NW).
2. Bommiyampatti reserved forest area (NW).

2.2.2. CENTRAL PLAIN REGION

This division is almost a plain country with isolated hillocks distributed here and there. In this division a number of seasonal streams are running (Plate II Fig.1). These seasonal streams rise from small hillocks and ultimately join with local tank and ponds.

2.2.3. SOUTHERN REGION

The two prominent hillocks which are present in this division are

1. Attur Ghat extension reserved forest and Kanjeri extension reserved forest (SE).
3. Karuvattuparai reserved Forest area (Plate II. Fig.2)
PLATE I

Fig:1  Source the Panoromic view of manukondamalai (Δ800) From Umbalikkampatti.

Fig:2  A Panoromic view of Bommiyampatti reserved Forest area.
PLATE II

Fig:1  The view of Sarabanga River.

Fig:2  The view of Karuvattuparai reserved forest area which situated in the Southern division of the Study area.
FIG. 6. GEOLOGICAL SETTING MAP OF THE STUDY AREA.
In the southern side of the study area two tanks are present. They are danispet tank and office gate tank (Plate III, Fig.1, Fig.2)

2.3 GEOMORPHOLOGICAL DIVISIONS

The geomorphological map (Fig.7) of the study area has prepared by the author and the features are discussed below.

2.3.1 PEDIMENTS

The pediments cover vast areas in Kadayampatti area. These are recognized in the satellite imageries by light tone, fine texture. These are gently sloping away from the hills and also found bordering outcrops. Development of drainage is feeble in this zone. The vegetation cover is very sparse. They are basically barren tracts mostly over gneiss and stand a testimony to long cycle of erosion. From the point of view of groundwater occurrence, pediments have poor potential of conductor.

2.3.2 DEEP PEDIMENTS

The deep pediments occupy shallow depressed low relief areas connected with good drainage network of streams and tanks and consist of highly weathered and jointed zone. They exhibit darker signature in the black and white satellite pictures and reddish colour in false colour composite suggesting that the colluvial materials hold more water and hence, support more vegetation. It is mostly a recharge zone and groundwater is found under water table conditions. The thickness of deposited material varies from place to place. It may be emphasized that the deep pediments are best suited for ground water storage.
Fig:1 A view of Denishpet Tank.

Fig:2 A view of office ghat tank near Denishpet Railway Station.
FIG. 7. GEOMORPHOLOGICAL MAP OF THE STUDY AREA.
2.3.3. SHALLOW PEDIMENTS

The shallow pediments are also identified throughout the study area with their medium gray tone, medium texture and they cover intermediate zone between pediments and deep pediments. Development of drainage is moderate and weathering is nominal in this zone.

2.3.4 ALLUVIAL FANS

The morphology of alluvial fans is related to the incision in the drainage basin towards up-stream. Alluvial fan is directly proportional to the size of drainage basin while alluvial fan gradients are proportional to those of incised valley upstream.

2.3.5. BAJADAS

Bajadas are continuous sheets of alluvium, miles in length, situated at the border zones between the study area and surrounding high lands. A serious of adjacent alluvial fans way in time coalesces to form a bajada. The channels in the bajadas are likely to slight during each season and is composed of poorly sorted layers of coarse and fine debris.

2.3.6. STRUCTURAL HILLS

Structural hills are miner ridge landforms found as small and detached in the plains. It is characterized by its linear alignment more or less parallel to the strike of the terrain. Kanjeri malai is the only structural hill present in the study area.
2.3.7. RESIDUAL HILLS

Residual hills are those hills which are not aligned to the regional strike of the area. Karuvattuparai is the only residual hill present in the study area.

2.4. DECHARGE AREA

In the northern portion of the study area, Manukondamalai reserved forest, Bommiampatti reserved forest serve as recharge areas, whereas in the east portion Pallapalli reserved forest, South east Attur Ghat extension reserved forest, Kanjeri extension reserved forest and south portion Karuvattiparai reserved forest serve as an important recharge area.

2.5 DRAINAGE

Drainage patterns refers to the particular plan or design which the individual stream courses collectively form. The drainage pattern as Kadayampatti area is mostly represented by parallel drainage pattern (Fig 8) indicating moderate and steep slopes usually found in areas of parallel and elongate land forms. The course of Sarabanga river in Kadayampatti area is mostly in NE-SW direction. In addition to these, there are number of seasonal streams, several irrigation tank and agriculture wells are also present in the study area. Major lines of drainage appear to align themselves either along the directions of major lineament or parallel to them. The drainage map of the study area is shown in Fig 9.
FIG. 9. DRAINAGE PATTERN OF THE STUDY AREA.
2.6 RAIN WATER INFILTRATION

Rainwater is initially absorbed by the soil but if the rain is either intensive or persistent, the rate of infiltration will be too slow and surface run-off results. Some rainwater will evaporate from the surface of the vegetation or from the ground. To begin with, the water that infiltrated is observed as soil moisture. As infiltrated continues, more free water gravitates down through soil. If there has been no rain for a long time, a great deal of water will be observed by the sub-soil resulting into integrate flow of groundwater.

2.7 SOIL TYPE

The soils of the study area are developed from weathering of rocks like charnockite. Soil is differentiated from the underlying regolith by the varying mixtures of minerals, organic matter etc., that differ in appearance, composition and geology. Normally it is classified by its colour. The study area mainly consists of five types of soil (Fig. 10). They are:

1. Non-calcareous
2. Red insitu calcareous
3. Red colluvial calcareous
4. Black Soils
5. Mixed Soils

Out of these soil types, non-calcareous soil type covers the maximum area.
FIG. 10. SOIL MAP OF THE STUDY AREA.

LEGEND:
- Calcereous Soil
- Red Calcareous
- Red Colluvial (non-calcareous)
- Mixed Hill Soil
- Alluvial (non-calcareous)
- Red Calcareous Colluvial.

Scale: 1:250,000