SLOPE
3.7.0. GENERAL:
Slope is one of the important aspects that controls the infiltration of the rain water. The rock having a gentle slope and porous will have better infiltration than the rock with similar slope but impervious. Slope also plays a major role in the conservation of soil. The steeper slopes can’t retain the soil that has formed, but gentler slopes can retain the soil and helps in higher degree of agricultural activity. The said factors influence the land use capability. The slope percentage estimates the susceptibility of the soil erosion. This also guides the pattern of agriculture that has to be planned. The slope of Valagalamanda river basin is given as the figure, 3-26.

3.7.1. Methodology:
The methodology that is adopted in the preparation of slope map is in accordance with the guidelines of All India Soil and Land Use Survey on slope categories documented in Soil Survey Manual, (IARI, 1971).

The topographical maps of SOI are used in the preparation of slope map. The contours that are closely spaced are indicative of steeper slopes than the contours that widely spaced that point to gentler slopes. The topographical maps of 1:50,000 scale have contours of 20 meter interval. The vertical drop can be measured from the contour interval and the horizontal distance in between the contours. The slope percentage can be obtained by the following equation.

\[
\text{Contour interval} \times 100 = \text{Slope \%}
\]

Contour spacing x Scale of the map

For example:

Contour interval = 20m, Contour spacing = 2cm, Scale of the map = 50,000; (2cm x 50000 = 1000m)

\[
\text{Slope \%} = \frac{20 \times 100}{1000m} = 2\%
\]
3.7.2. Slope Category:

The distances between the contours are measured at umpteen places and the slope percentage is calculated following the said technique. Further, slope categorization is done according to the AIS & LUS guidelines. The categorization of slopes as per the guidelines is detailed below. (Table 3-4).

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Slope Category</th>
<th>Slope (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nearly Level</td>
<td>0 - 1</td>
</tr>
<tr>
<td>2</td>
<td>Very Gently Sloping</td>
<td>1 - 3</td>
</tr>
<tr>
<td>3</td>
<td>Gently Sloping</td>
<td>3 - 5</td>
</tr>
<tr>
<td>4</td>
<td>Moderately Sloping</td>
<td>5 - 10</td>
</tr>
<tr>
<td>5</td>
<td>Strongly Sloping</td>
<td>10 - 15</td>
</tr>
<tr>
<td>6</td>
<td>Moderately Steep to Steep sloping</td>
<td>15 - 35</td>
</tr>
<tr>
<td>7</td>
<td>Very Steep Sloping</td>
<td>&gt;35</td>
</tr>
</tbody>
</table>

Slope direction should be indicated for the last two categories, i.e., 6 and 7, having more than 15% of slope.

The slope map (Fig. 3-27) of the entire Chittoor district is given for a regional appraisal. The Valagalamanda River basin area covers the south eastern part of the district. As per the Relief and Slope map of the district, the slope of the plains is given as less than 10% and on the hill range it is given as 20% - 80%. The same is elaborated in accordance with the AIS & LUS guidelines.
The Valagalamanda River basin indicates three categories of slopes, viz., 0 – 1 – Nearly Level, 1 – 3 – Very Gently Sloping and >35 Very Steep Sloping.

3.7.3. Nearly Level, 0 – 1:

This covers the maximum part of the area under study, (Fig 3-26). It is this slope area that supports the maximum agricultural activity and it is the same slope that has all the high potential of ground water. This has blanket geometry.

3.7.4. Very Gently Sloping, 1 – 3:

This occurs at the foot hills of the hill range and occurs as a broad linear patch. It is covered by the Piedmont Zone, (Fig. 3-26)
3. 7. 5. Very Steep Sloping. > 35:

This covers the steep dipping Structural Hills located on the western side of the area under report. This occurs as a linear stretch (Fig. 3-26).

3. 7. 6. Slope versus Ground Water conditions:

The very steep slope on the western side acts as a run-off zone, without any infiltration. The same slope acts as a recharge zone for the low lying plains. The piedmont zone that is located at the foot of the hill receives major part of the run-off and allows greater quantity of surface water to get infiltrated into the sub-surface, because of its high porosity and permeability. There are no structures like dug wells, bore wells and tanks on this zone as it is covered by Reserved Forest. But, this slope that is very gently sloping acts as a recharge zone to the pediplain as the flow of the sub-surface water is towards east, where very vast and extensive vast nearly level plain supporting the agricultural activity is present.