5. CONCLUSIONS

5.1 Conclusions

1. Analysis of stream shows that the basin is of 9\textsuperscript{th} order sub watersheds 16, 19, 31, 34, have cumulative length of stream more than 900 km. where as sub watersheds 26, 24, 27, 12 have cumulative length of the stream less than 100 km.

2. Morphometric parameters Bh lies in the range 18-358, Rn lies in the range 0.58-9.68 Dd lies in the range 23.18-49.45, Rb lies in the range 1.88-4.41, Fu lies between 340.7-546.58, T lies in the range 3.38-167.53, Rf lies in the range 0.011-0.65 and Re lies between 0.069-0.51, Rc lies in the range 0.11-0.38 and C lies between 0.02 -0.04

3. Based on compound value of morphometric parameters, it is found that 16 (1, 2, 3, 7, 8, 10, 11, 12, 13, 14, 16, 18, 26, 28, 33, 35) sub watersheds of area 315.65 Sq.Km about 48% of basin area classified under severe status, 9 (6, 9, 15, 22, 25, 27, 30, 32, 34) sub watersheds of area 155.87 Sq.Km which is 23% of basin area classified under moderate status, 6 (5, 17, 19, 21, 24, 29) sub watersheds of area 108.28 Sq.Km about 16% of total area classified under slight status and 4 (4, 20, 23, 31) sub watersheds of area 88.88 Sq.Km classified under very slight status.

4. USLE parameters R- lies between 423.26 – 623.79 mm, K factor varies from 0.1 to 0.3, P factor lies between 0.5 to 0.1, LS factor lies in the range 0-44.82 and C factor lies in the range 0.004 – 1.

5. Based on USLE parameters and further analysis show that out of 35 sub watersheds in Sukhana basin 5 watersheds i.e.1, 3, 28, 33, 35 are under severe erosion where as 9 watersheds 2, 8, 10, 15, 16, 30, 31, 32, 34 are under moderate erosion. Six sub watersheds namely 4, 11, 12, 13, 18, 19 are under slight erosion and remaining 15 sub watersheds 5, 6, 7, 9, 14, 17, 20, 21, 22, 23, 24, 25, 26, 27, 29 are under very slight erosion.

6. The comparative analysis of morphometric parameters and USLE parameters shows that sub watershed 1, 3, 28, 33, 35 (5 nos) are under severe erosion, 4 sub watersheds 15, 30, 32, 34 are under moderate and one sub watersheds 19 is under slight erosion and two sub watersheds namely 20, 23 are under very slight erosion.
7. Land use / land cover change detection, it is found that during 1996-2014, water bodies cover have loss of 4 Sq. Km. Barren land have 146 Sq.Km. loss and forest area with 96 Sq.Km. loss. It is found that urbanization area has gain of 51 Sq.Km. and agricultural land cover also have gain of 195 Sq.Km. Land use / land cover must be improved with reference to resource management and application of conservation treatment in the basin.

8. The analysis shows that land class II, III, IV, VI and VII are dominant in the basin. Class suitable for cultivation are II, III and IV have areal extent 134.41, 150.12 and 165.80 Sq.Km. which is 67.32% of the total basin area and class VI and VII are not suitable for cultivation has areal extent 101.68 Sq.Km. and 116.68 Sq.Km. respectively which is 32.68% of the total area.

9. Based on land capability classification land use planning with reference to conservation planning for Class II, III, IV are gully control measures, farm bunding such as compartment bunding, contour bunding and graded bunding. Whereas, for class VI measures are continuous contour trenches and staggered trenching and for class VII treatment propose a pasture development.

5.2 Contribution of the Study

✓ Prioritization of sub watersheds and erosion zone mapping of basin based on rank obtained from analysis of morphometric parameters is sufficient for land use planning with reference to conservation of soil and water in the sub water shed of the basin because it validate land capability class obtain from assessment of soil erosion from USLE model.
✓ Developed land capabilities maps are useful for planners and decision makers for planning and safeguards the resources.
✓ Open source data is useful for conservation and planning of basin which saves time and money.

5.3 Scope for Future Work

✓ Use of high resolution satellite data could be used for analysis of morphometry and USLE parameter.
✓ Status of erosion can be also checked by conducting experiments for silt deposition in the sub watershed of the basin.
Data driven techniques could be applied from optimization of USLE parameters and prioritization of watersheds.

Factors such as soil depth and soil type could be ascertained through experimentation for land use planning through land capability classification.