

Department of Geology, UCS&I, MGU, Nalgonda

IV- SEMESTER, ID- Watershed Management

Unit - I

Introduction: Definition, concepts of watershed; *Effects of watershed on community:* a) topography b) channel networks c) geology and soils d) vegetation and landuse; *Soils:* Types of rocks, weathering of rocks, factors of soil formation, soil forming processes, soil profile, physical properties, types of the soils in India; *Soil erosion:* Basic processes, factors affecting soil erosion, types of soil erosion; *Watershed development:* Land capability classification, concept, objectives and need for watershed development.

Unit - II

Hydrologic processes: Hydrologic cycle, precipitation (liquid/solid), interception, evaporation and transpiration, infiltration and run-off; *Participatory rural appraisal (PRA) in watershed programme:* Basic principles, assumptions, basis, important types, benefits, tools, maps and models of PRA programmes; *Erosion control measures on agricultural land:* Contour cultivation, contour bunding, graded bunds, bench terracing, grassed water ways; *Mechanical erosion control measures for non agricultural land:* Contour trenching, gully control measures, vegetative control measures, checkdams, brush dams, semi permanent gully, control structures, permanent control structures.

Unit - III.

Water conservation and Harvesting: Rainwater harvesting, catchment harvesting, harvesting structures, soil moisture conservation, check dams, artificial recharge, farm ponds, percolation tanks; *Groundwater management in watershed:* Types of aquifers, vertical distribution of groundwater, conjunctive use of surface and use of groundwater; *Remote sensing,* thematic maps, geological and hydrogeological maps.

Unit - IV

Ecosystem Management: Role of ecosystem, crop husbandry, soil enrichment, inter-, mixed- and strip-cropping, cropping pattern, sustainable agriculture, bio-mass management, dryland agriculture, Silvi pasture, horticulture, social forestry and afforestation; *Grassland management, /Joint forestry management* Monitoring and evolution of watershed; *Planning of watershed management activities:* Preparation of action plan, administrative requirements.

Books Recommended

Watershed Management

1. Watershed Management by JVS Murthy, - New age International Publishers.
2. Water Resource Engineering by R.Awurbs and WP James, - Prentice Hall Publishers.
3. Integrated watershed management - Rawat publications by - Rajesh Rajora.
4. Land and Water Management by VVN Murthy, - Kalyani Publications.
5. Irrigation and Water Management by D.K.Majumdar, Printice Hall of India.