

Watershed Management

- A **watershed** is simply the geographic area through which water flows across the land and drains into a common body of water, whether a stream, river, lake, or ocean. The watershed boundary will more or less follow the highest ridgeline around the stream channels and meet at the bottom or lowest point of the land where water flows out of the watershed, the mouth of the waterway.

- Much of the water comes from rainfall and stormwater runoff. The quality and quantity of stormwater is affected by all the alterations to the land--mining, agriculture, roadways, urban development, and the activities of people within a watershed. Watersheds are usually separated from other watersheds by naturally elevated areas.

-

Why are watersheds important

- Watersheds are important because the surface water features and stormwater runoff within a watershed ultimately drain to other bodies of water. It is essential to consider these downstream impacts when developing and implementing water quality protection and restoration actions. Everything upstream ends up downstream. We need to remember that we all live downstream and that our everyday activities can affect downstream water

Watershed Management

- Management of the environment has been primarily focussed on specific issues such as air, land, and water. Most efforts have resulted in decreasing pollutant emissions to air and water, improved landfills, remediation of waste sites and contaminated groundwater, protection of rare and endangered species, design of best management practices to control water and contaminant runoff, and much more.

- A watershed is an area of land and water bounded by a drainage divide within which the surface runoff collects and flows out of the watershed through a single outlet into a larger river (or) lake.

TYPES OF WATERSHED

- Watersheds is classified depending upon the size, drainage, shape and land use pattern.
- Macro watershed (> 50,000 Hect)
- Sub-watershed (10,000 to 50,000 Hect)
- Milli-watershed (1000 to 10000 Hect)
- Micro watershed (100 to 1000 Hect)
- Mini watershed (1-100 Hect)

Objectives of watershed management

- The different objectives of watershed management programmes are:
- 1. To control damaging runoff and degradation and thereby conservation of soil and water.
- 2. To manage and utilize the runoff water for useful purpose.
- 3. To protect, conserve and improve the land of watershed for more efficient and sustained production.
- 4. To protect and enhance the water resource originating in the watershed.
- 5. To check soil erosion and to reduce the effect of sediment yield on the watershed.

- 6. To rehabilitate the deteriorating lands.
- 7. To moderate the floods peaks at down stream areas.
- 8. To increase infiltration of rainwater.
- 9. To improve and increase the production of timbers, fodder and wild life resource.
- 10. To enhance the ground water recharge, wherever applicable.

Factors affecting watershed management

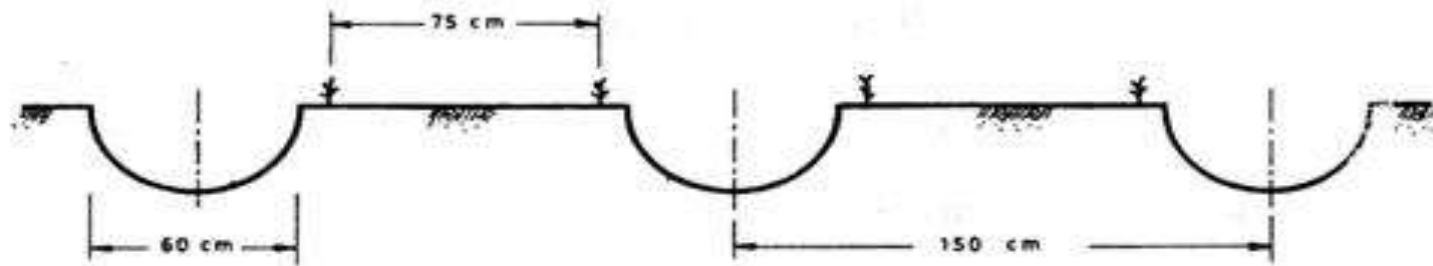
- **a) Watershed characters**
 - i) Size and shape
 - ii) Topography
 - iii) Soils
 - iv) Relief
- **b) Climatic characteristic**
 - i. Precipitation
 - ii. Amount and intensity of rainfall

- **c) Watershed operation**
- **d) Land use pattern**
- i. Vegetative cover
- ii. Density

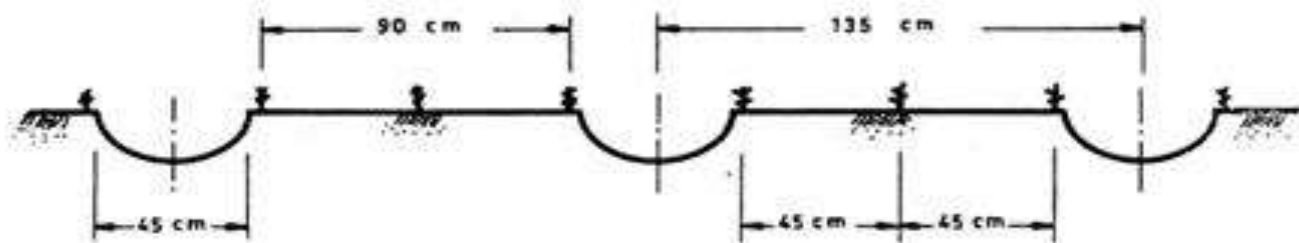
- **Watershed management practices**
 1. Interm of purpose
 1. To increase infiltration
 2. To increase water holding capacity
 3. To prevent soil erosion
 2. Method and accomplishment

Some of the watershed management structures

- **BROAD BEDS AND FURROWS**
- **a. FUNCTION**
To control erosion and to conserve soil moisture in the soil during rainy days.
- **b. GENERAL INFORMATION**
- The broad bed and furrow system is laid within the field boundaries. The land levels taken and it is laid using either animal drawn or tractor drawn ridgers.
-



MAIZE CROP



SORGHUM CROP

1. BROAD BEDS AND FURROWS

- **c. COST**

Approximate cost for laying beds & furrows is Rs.1800 / ha.

- **d. SALIENT FEATURES** Conserves soil moisture in dryland
- Controls soil erosion.
- Acts as a drainage channel during heavy rainy days.



2. CONTOUR BUND


- **a. FUNCTION**
To intercept the run off flowing down the slope by an embankment.
- **b. GENERAL INFORMATION**
- It helps to control run off velocity. The embankment may be closed or open, surplus arrangements are provided wherever necessary.
- **c. COST**
- Approximate cost of laying contour bund is Rs.1400 / ha.
- **d. SALIENT FEATURES**
- i. It can be adopted on all soils
- ii. It can be laid upto 6% slopes.
- iii. It helps to retain moisture in the field.



3. BENCH TERRACING

- **a. FUNCTION**
 - It helps to bring sloping land into different level strips to enable cultivation.
- **b. GENERAL INFORMATION**
 - It consists of construction of step like fields along contours by half cutting and half filling. Original slope is converted into level fields. The vertical & horizontal intervals are decided based on level slope.
- **c. COST**
 - Approximate cost for laying the terrace is Rs.5000 / ha.

- **d. SALIENT FEATURES**

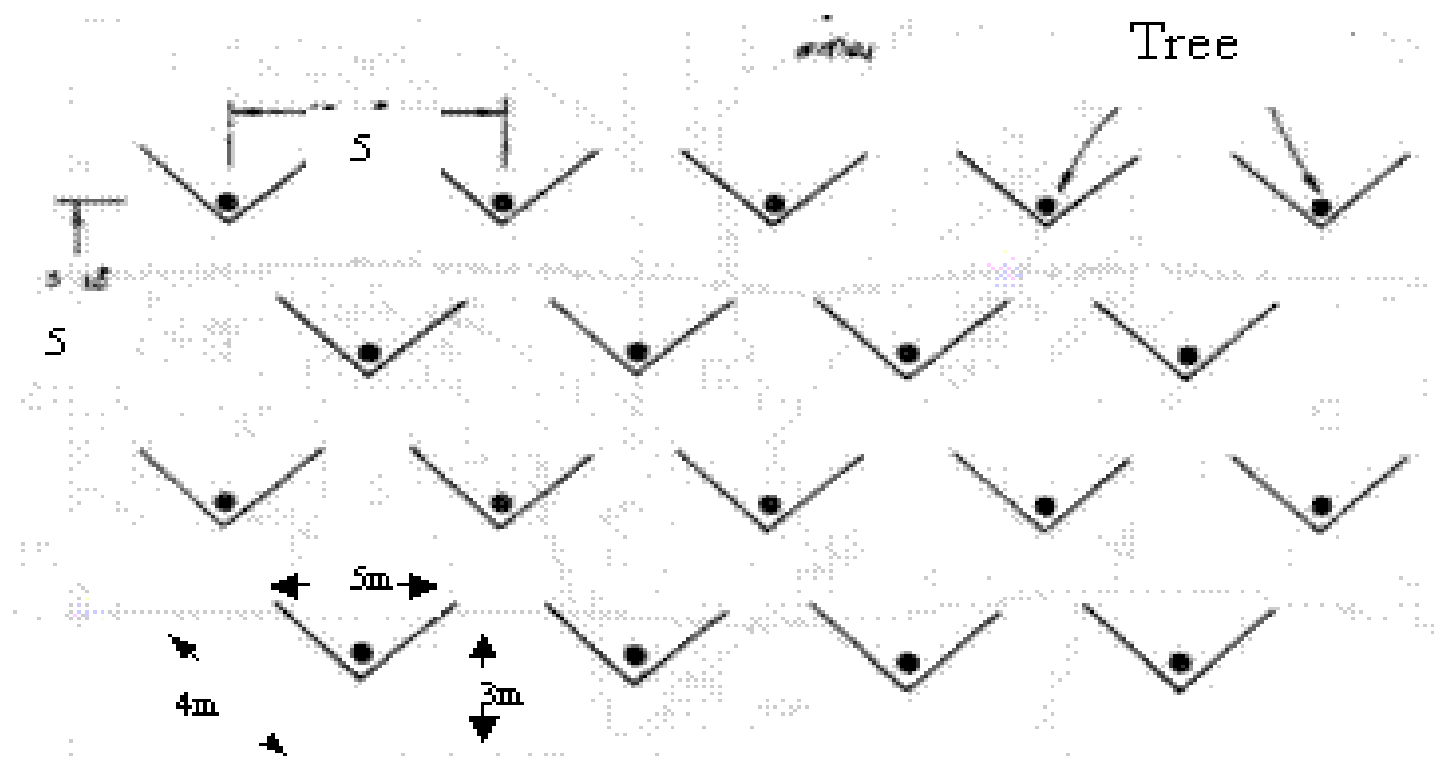
- Suitable for hilly regions.
- The benches may be inward sloping to drain off excess water.
- The outward sloping benches will help to reduce the existing steep slope to mild one.
- It is adopted in soils with slopes greater than 6%
- 



4. MICROCATCHMENTS FOR SLOPING LANDS

- - a. **FUNCTION**
- It is useful for insitu moisture conservation and erosion control for tree crops.

-





- **SALIENT FEATURES**

- Slope ranges from 2 –8%
- Soil type – Light to moderate texture
- Insitu moisture conservation with staggered planting
- Suitable for dry land Horticulture & Agroforestry
- Bund height – 30 to 45 cm.

5. Check dam

- **Salient features**
- A low weir normally constructed across the gullies
- Constructed on small streams and long gullies formed by erosive activity of flood water
- It cuts the velocity and reduces erosive activity
- The stored water improves soil moisture of the adjoining area and allows percolation to recharge the aquifers
- Spacing between the check dams water spread of one should be beyond the water spread of the other
- Height depends on the bank height, varies from a metre to 3 metre and length varies from less than 3m to 10m
- Cost varies from Rs. 40000/- to Rs. 100000/- per unit



6. Percolation pond:

- **function**
To augment the ground water recharge
- **Salient features**
- Shallow depression created at lower portions in a natural or diverted stream course
- Preferable under gentle sloping stream where narrow valley exists
- Located in soils of permeable nature
- Adaptable where 20-30 ground water wells for irrigation exist with in the zone of influence about 800 – 900m
- Minimum capacity may be around 5000 m³ for the sack of economy
- Also act as silt detention reservoir
- Cost varies from Rs. 60000 to 150000 per unit



7. Stone Barriers

