

Watershed Management and Evaluation

(Manoj V. Jadhav, *Missa Shivaram Prasad and Gopu Ravichandra)

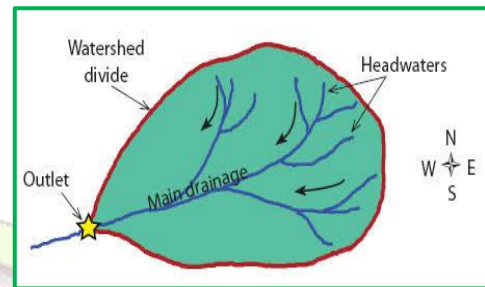
Department of Agricultural Engineering, College of Agriculture, Risod, Washim

*Corresponding Author's email: missashivaram2003@gmail.com

Water is the most precious natural resource which is important to each and every organism on earth but ver increasing population and decreasing water resources is one of the major challenges that India is facing.

What is watershed ?

Watershed can be defined as a unit of area which covers all the land which contributes runoff to a common point or outlet and surrounded by a ridge fine.



It is also known as ridge line Watershed delineation is to describe or sketching out the area bounded by ridge line , contributing runoff at common point and dividing or separating it from the adjoining area . The delineation of priority area can be performed to some extent by reconnaissance survey and stud -of topo - shells . However , this technique is slow and also not provides very accurate information . Normally , the photographs of 1 : 60,000 scales serves more efficient , but photographs of larger scale such as 1 : 15,000 can also be used for the purpose . The demarcation of priority areas should be accomplished.

Why use of Watershed System?

Watersheds are extremely important. Healthy forested watersheds provide many services such as cleaning our drinking water supplies and stabilizing soils. The waterbodies they drain to provide us recreational opportunities and aesthetic benefits. When vegetation within a watershed os replaced by impervious surface like roads parking lots and roof tops,it can have a negative impact on waterbodies. It increase the speed and amount of stromwater runoff flow into waterbodies and may cause erosion ,turbidity and degraded wildlife habitats.

Classification of watershed

[A]. Largent number of terms are very frequently and lo classify watersheds in different sizes:

- microsoft watersheds
- small watersheds
- large watersheds

Small watersheds: Small watersheds are those where the overland flow is the main contributor to peak runoff flow and channel characteristics do not affect the overflow.

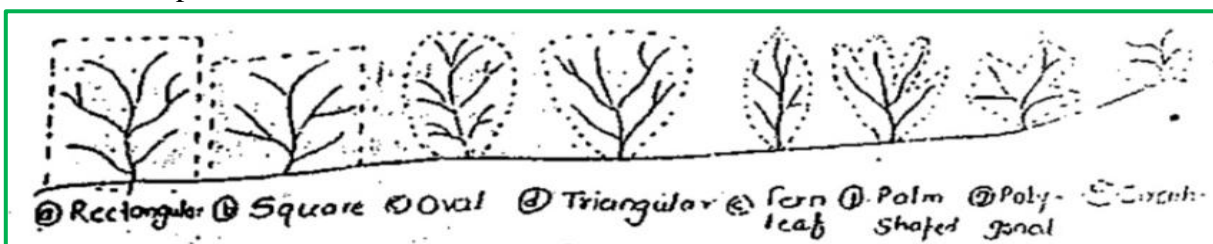
Large watersheds: They are those give peak flows are generally influenced by channel characteristics and basin storage.

[B]. Watersheds are also classified in different categories based on area that the watershed contains:

a) Micro watershed	0 to 10 ha	Less than 100 ha
b) Small watershed	10 to 40 ha	100 – 1000 ha
c) Mini watershed	40 to 200 ha	or
d) Sub-watershed	200 to 400 ha	1000 – 5000 ha
e) Macro watershed	400 to 1000 ha	5000 -10000 ha
f) River basin	above 1000 ha	above 10000 ha

Classification based on shape

1. Square
2. Triangular
3. Rectangular
4. Circular
5. Palm Shaped
6. Polygon Shaped
7. Oval Shaped



Morphology characteristics of watershed

1. Size
2. Shape
3. Topography
4. Geology, Rock and Soil
5. Climate
6. Vegetation
7. Land Use

Objectives of Watershed Management

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 Effect the 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

e) Social status of inability

f) Water resource and their capabilities

Watershed management practices

Interns of purpose

1. To increase infiltration
2. To increase water holding capacity
3. To prevent soil erosion
4. Method and accomplishment

Agronomical practices of watershed management: Watershed management basically refers to the efficient management and conservation of surface and groundwater resources. It involves the prevention of runoff and storage and recharge of groundwater through various methods like percolation tanks, recharge wells, etc. The methods of watershed management are:

- 1]Contour bund
- 2]Bench terracing
- 3]Micro catchments for sloping lands
- 4]Check dam
- 5]Percolation pond
- 6]Stone Barriers

Steps in Watershed Management: Watershed management involves determination of alternative land treatment measures for, which information about problems of land, soil, water and vegetation in the watershed is essential. In order to have a practical solution to above problem it is necessary to go through four phases for a full scale watershed management.

Programme

- a. Recognition phase.
- b. Restoration phase.
- c. Protection phase
- d. Improvement phase

(i) Recognition Phase: It involves following steps

- (a) Recognition of the problem
- (b) Analysis of the cause of the problem and its effect.
- (c) Development of alternative solutions of problem.

(ii) Restoration Phase: It includes two main steps

- (a) Selection of best solution to problems identified
- (b) Application of the solution to the problems of the land

(iii) Protection Phase: This phase takes care of the general health of the watershed and ensures normal functioning. The protection is against all factors which may cause determined in watershed condition.

(iv) Improvement Phase: This phase deals with overall improvement in the watershed and all land is covered. Attention is paid to agriculture and forest management and production, forage production and pasture management, socio economic conditions to achieve the objectives of watershed management.