WATERSHED:

Watershed may be defined as the land area from which surface water drains under gravity to a single outlet such as a stream, a river or a lake.

The rainwater flows from the ridge into *nallas* & finally collects in the ponds. The entire area with a common drainage is called watershed.

Thus, watershed is a geographic unit that collects, stores & releases water. Source of this water is rain, snow or coastal fog. It gets stored in ponds, lakes, subsurface soil & geological formations. River & streams as well as groundwater flow, each of them releases this water.

Watersheds are also called 'Drainage basins' or 'Catchments' because they 'drain' & 'catch' rain & somewhat water that falls onto land.

IMPORTANCE OF WATERSHEDS:

Watersheds play a crucial role in natural functioning of the earth.

i. Hydrologically watersheds integrate the surface water run off of an entire drainage basin.

ii. Economically, they play a crucial role as a source of water, food, recreational amenities & many more activities.

iii. Watershed's water can be used for irrigation, power generation, transportation etc.

iv. These also influence
    a. Sedimentation & Erosion
    b. Vegetation growth
    c. Floods
    d. Droughts

v. Ecologically, watersheds constitute a critical link between land & sea. They provide habitat within wetlands, rivers & lakes for 40% of world's fish species, some of which migrate between marine & fresh water systems.

OBJECTIVES OF WATERSHED MANAGEMENT;

i. Rehabilitation of watershed through proper land use, adopting conservation methods for minimizing soil erosion & moisture retention to ensure high productivity of land.

ii. Managing watersheds for beneficial sustainable development activities such as
    a. Domestic water supply
    b. Irrigation
    c. Hydropower generation
    d. Transportation &
    e. Recreation

iii. Minimizing the risks of floods, droughts & landslides

iv. Developing rural areas in the regions with clear plans in order to improve the economy of the region.

v. Restoring soil fertility which is vital for agriculture.

vi. Retaining habitats for aquatic flora & fauna.

STRATEGIES FOR WATERSHED MANAGEMENT:

i. RAINWATER HARVESTING APPROACH:

One of the ways of watershed management is rainwater harvesting by allowing the rainwater to move down the slopes slowly, ensuring optimum infiltration & percolation.

Some of the procedures one could adopt are:

a. Reducing the impact of rain on the soil
b. Checking speed of runoff water at various intervals
c. Taking up all operations on the contour
d. Diverting the excess of water to prevent the pressure on the processes that start from the highest point of watershed & the end right in the lower parts.

ii. WATERSHED PROTECTION APPROACH:

Watershed protection approach of management is a strategy for effectively protecting & restoring aquatic ecosystems & protecting human health. By this strategy many water quality & ecosystem problems have been solved by watershed level rather than based on an individual water body or discharger level.

Imp. features of this strategy are

e. targeting priority problems
f. promoting high level of stake holder involvement
g. integrated solutions that make use of the expertise
h. authority or multiple agencies &
i. measuring success through monitoring & data gathering.

STEPS IN WATERSHED MANAGEMENT:

i. Preparation of base maps for carrying out surveys.

ii. Reconnaissance survey of the watershed for overall development.

iii. Assessing rainfall characteristics & classification of lands for different uses based on capability classification for agriculture, forestry, pasture, horticulture etc.

iv. Preparation of inventory of existing land uses & farm sizes.

v. Appraisal of agricultural production patterns & potentials, present & potential markets & possible group action managements.

vi. Carrying out topographic & hydrologic surveys for engineering works.

vii. Geo-hydrological survey to delineate areas suitable for groundwater development.

viii. Formulation of an integral time-based plan for
   a. land & moisture conservation
   b. groundwater recharge
   c. development of productive afforestation
   d. agricultural production
   e. grasslands &
   f. horticulture

ix. Assigning of priorities for implementation of the project.

x. Assigning social costs & benefits.

Watershed management involves effective methods of retaining water by

a. Contour bunding/graded bunding
b. Check dams
c. Gully control structures including land leveling/ land smoothening
d. Bench terracing
e. Farm ponds
f. Percolation ponds
g. Water ways &
h. Diversion drains

The process starts from the topmost rocky areas where the runoff water needs to be drained out by forming diversion drains in order to protect steep slopes below, which are suited only for growing fodder.