



SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution Coimbatore – 35

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and Affiliated to Anna University , Chennai.

DEPARTMENT OF AGRICULTURAL ENGINEERING

19AGE308

WATERSHED PLANNING AND MANAGEMENT





IMPORTANCE OF WATERSHED PLANNING



- Planning is the process of formulation of a project consisting of practices/strategies to achieve certain objective(s) by a definite time in future keeping the constraints in mind and considering all the available techniques.

Watershed Planning pertains to the planning related to watershed(s), so as to achieve certain objective(s) related to watershed(s).

Although planning is a continuous process, it is split into a time bound process to facilitate the evaluation of its impact over a time period.

Like any planning, watershed planning also involves the integration of objectives, constraints, available techniques to improve the utility and effectiveness of the watershed(s) over a certain time period



planning involves the following three sets of factors:

Objectives must be established on the basis of a problem analysis

Constraints to implementing a proposed management practice (i.e., project) need to be determined, including biophysical limitations, budget restrictions, and social/ cultural/ political conditions that are associated with the situation; and

There needs to be managerial techniques & capabilities available for implementing any proposed practice. Planning, therefore, involves the integration of objectives, constraints, and available techniques to improve the effectiveness and implementing watershed planning.



Steps in the Watershed Planning Process

The watershed planning process is likely to involve the following five sequential steps:

1. Monitor and evaluate past activities and identify problems and opportunities.
2. Identify the main characteristics of the problems confronted, opportunities to resolve these problems, and establish the objectives and constraints to accomplish these objectives. This eventually leads to the formulating strategies for action.
3. Identify alternative management practices (i.e., projects) to implement the formulated strategies within the limits of the constraints.
4. Appraise and evaluate the impacts of the alternative management practices (i.e., projects) including the environmental, social, and economic effects and assess the uncertainty associated with the impacts.
5. Rank or prioritize the alternative management practices and recommend the project to be implemented when a recommendation is requested.



Data Required for Watershed Planning

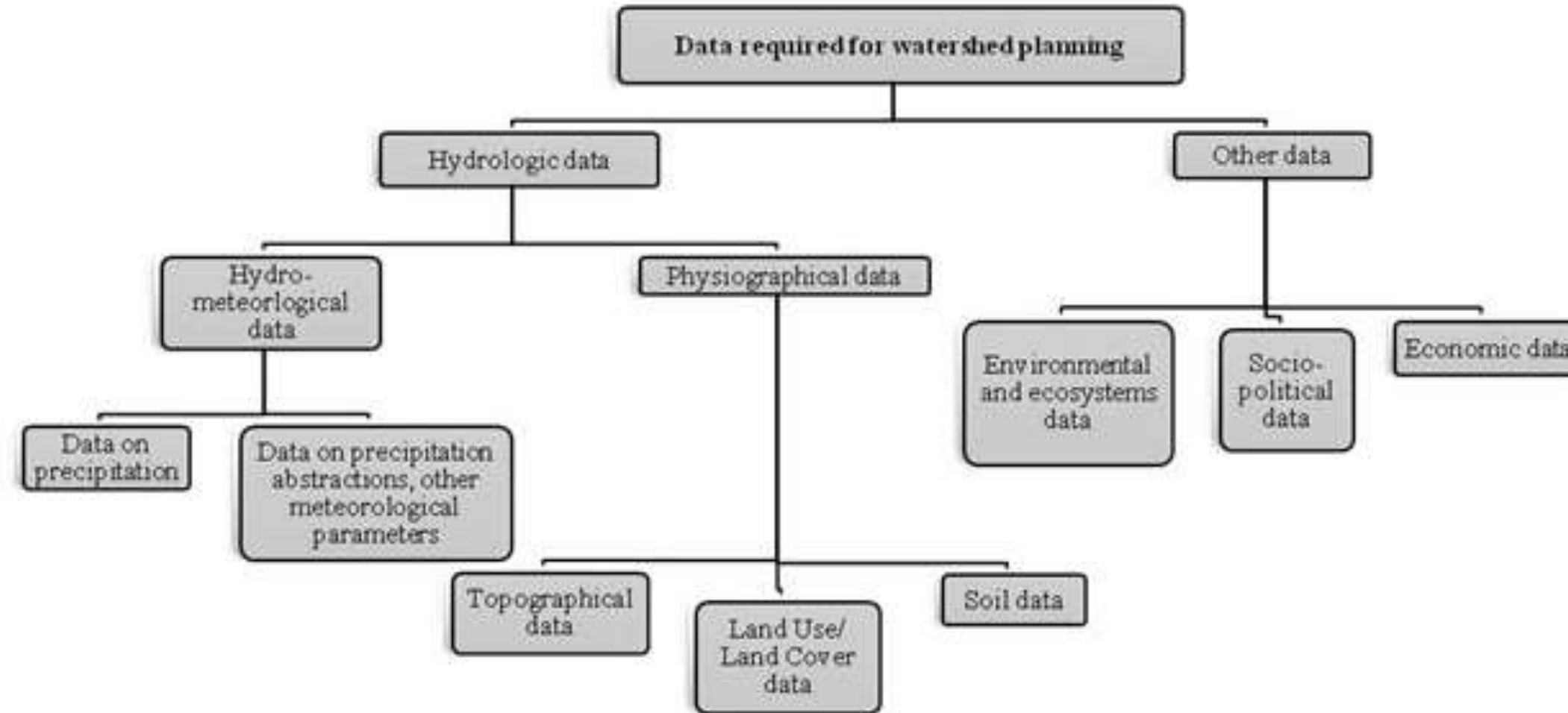


Fig. 7.1. Grouping of the data required for watershed planning.



USE OF HYDRO-METEOROLOGICAL DATA IN WATERSHED PLANNING

It includes data on

- ▀ precipitation,
- ▀ abstractions of precipitation and
- ▀ other meteorological parameters

which influence the watershed management.



WATERSHED PLANNING OBJECTIVES AND THE FEATURES ASSOCIATED WITH THEM

WATERSHED PLANNING OBJECTIVE	ASSOCIATED FEATURES
Hydrological characterization:	a) Watershed planning, b) General water balance;
Flood management and control:	a) Structures [i.e., dams, river training b) Flood forecasting & warning, c) Flood plain zoning & flood estimation, d) Coastal inundation;
Irrigation and drainage:	a) Supply, b) Demand scheduling;
Groundwater planning:	a) Recharge, b) Flooding management;
Water quality management:	a) Pollution control, b) Dilution, c) Salinity & sedimentation



Utility of Land Use/ Land Cover (LULC) Data in Watershed Planning

LULC data consists of data on **forests, grass/ range lands, cultivated lands, orchards, wildlife reservations, recreation areas, urban/ rural areas, water bodies, eroded areas** etc.

LULC influences practically all the processes of hydrologic cycle like interception, infiltration, surface runoff, surface storage, groundwater runoff, groundwater storage, evapo-transpiration (ET).





Utility of Soil Data in Watershed Planning



Soil data can be an important factor in determining the amount of

- erosion and
- storm water runoff

that occurs in the watershed of interest.

It can enable the estimation of **water retained within the soil, analyze the slope stability or the flow of groundwater through the soil pores.** Data on the types of soils in the watershed and their characteristics helps us to identify the areas that are prone to erosion or sedimentation as well as the areas which are more likely to experience runoff.



WATERSHED DELINEATION

- Creating a boundary that represents the contributing area for a particular control point or outlet
- Used to define boundaries of the study area, and/or to divide the study area into sub-areas

