Concept of Watershed

Programme : Five year Integrated M.Sc., Geography / M.Sc., Geography

Course : Watershed Studies

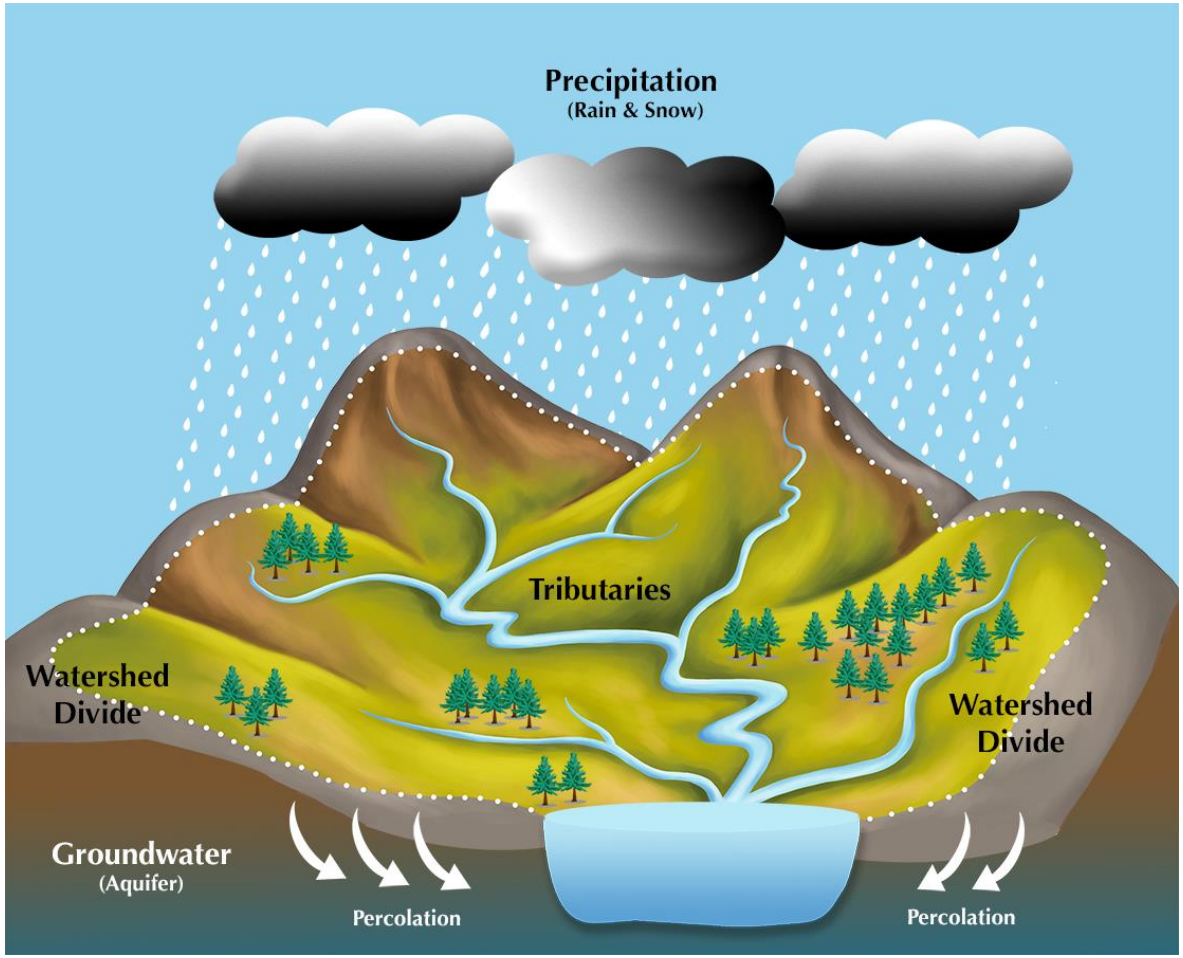
Dr. P. Masilamani
Assistant Professor
Department of Geography
Bharathidasan University
Tamil Nadu
E-mail: masilamani@bdu.ac.in

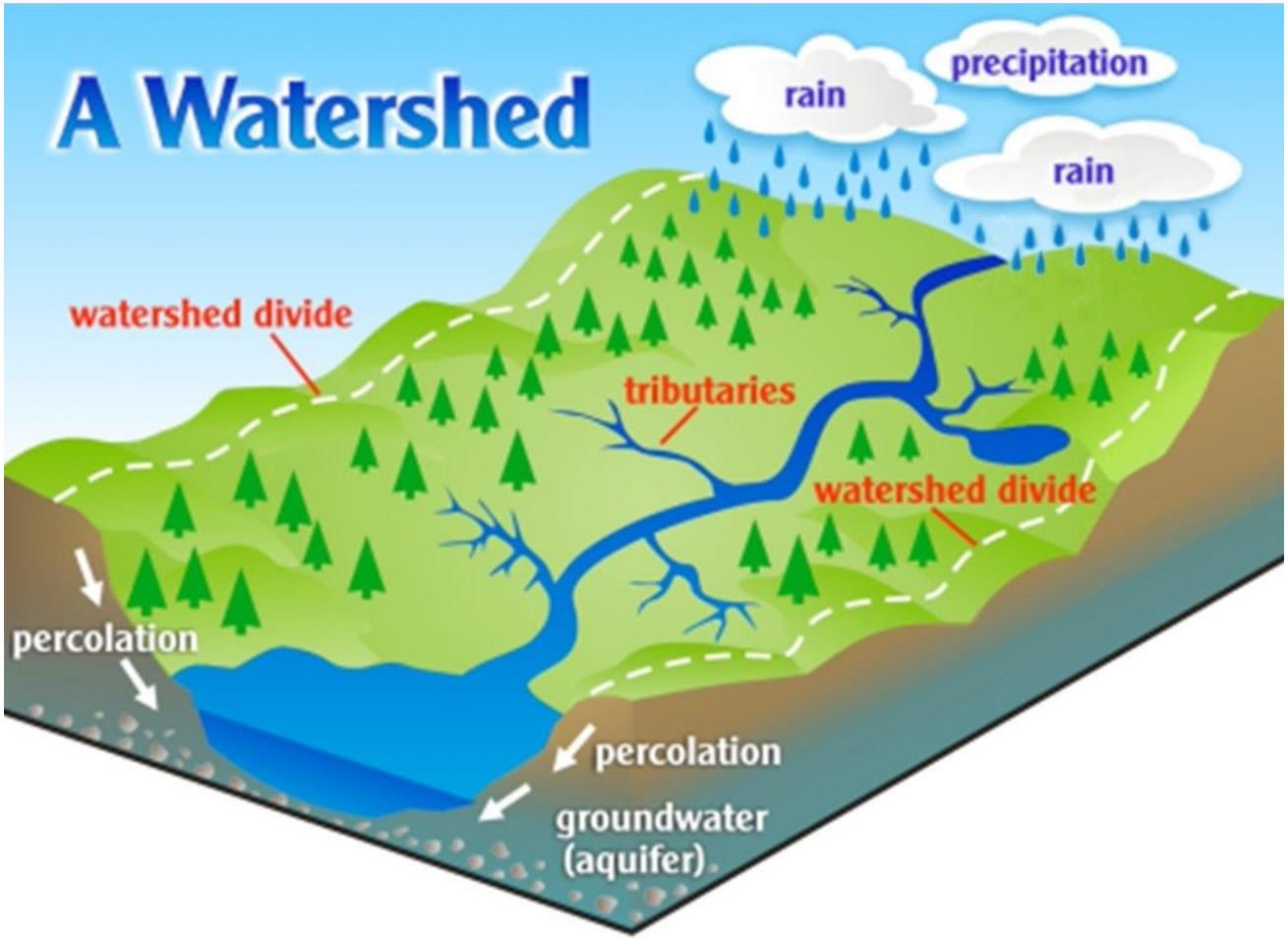
PEOPLE AND WATER

- Irrigation was discovered in China, on the banks of the ***Yellow River,*** and in the Fertile Crescent, which roughly corresponds to the watersheds of three major Near East rivers: ***the Nile, the Euphrates and the Tigris.***
- By 2500 BC, irrigated agriculture was being practiced in the Indus valley.
- Between 500 and 1 000 years later it had spread to peninsular India and southeast Asia.
- By 1500 BC, it had been reinvented in the American continent.

- The Greeks, Romans and other Mediterranean people were familiar with water engineering, but they ***applied the technology more to urban water supply than to irrigation.***

Watershed refers to an area of land where all the water drains to a central point, such as a lake, river or stream.



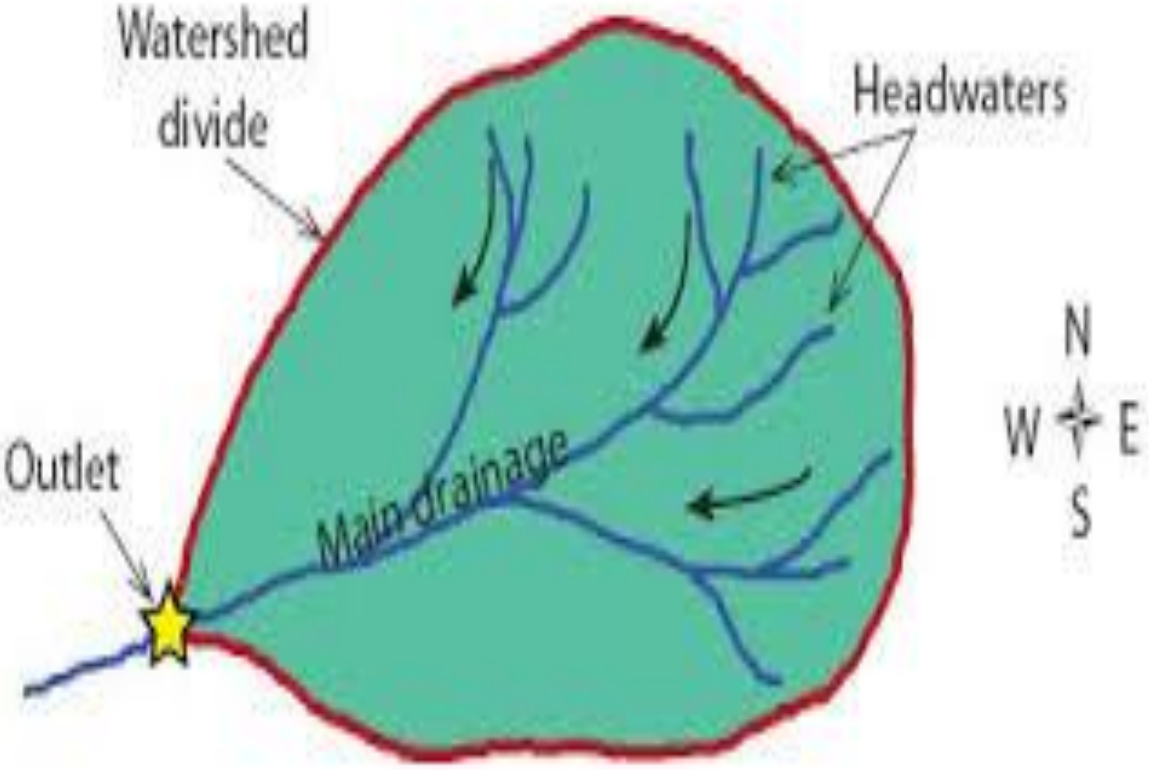

A Watershed
precipitation
rain
rain
watershed divide
tributaries
watershed divide
percolation
percolation
groundwater
(aquifer)

- Watersheds come in all sizes; some watersheds are small like an inland lake, whereas some watersheds comprise thousands of miles of land which includes rivers, streams, reservoirs and so on.

- Watersheds hold great significance in irrigation, due to which there are several methods of proper watershed management.
- Through watershed management, one can implement plans and projects that sustain and enhance watershed functions.
- Watershed functions include *capturing, storing and recharging groundwater, filtering out water pollutants, and securing the release of rainwater to avoid floods during heavy rainfalls.*

TYPES OF WATERSHED

- Watersheds is classified depending upon the size, drainage, shape and land use pattern.
- Macro watershed (> 50,000 Hect />500 Sq.Km)
- Sub-watershed (10,000 to 50,000 Hect)
  (100-500 Sq.Km).
- Milli-watershed (1000 to10000 Hect)
  (10-100 Sq.Km).
- Micro watershed (100 to 1000 Hect)
- **(01 -10 Sq.Km)**
- Mini watershed (1-100 Hect)
  (<10 Sq.Km)


Watershed divide
Headwaters
Outlet
Main drainage
N
W
E
S

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.

Why Is Water Resource Management Important?

Water is the most vital asset in almost every aspect of our lives, and there's no substitute for it.

Water-related issues continue to increase and are the defining challenge we might face in the 21st century.

So, why is water resource management important?

- With the global population rising, the United Nations predicts a **40% global water supply shortfall by the end of 2030.**
- This would be the case if current consumption and production patterns remain unattended and unchanged.

- **Water security**
- **Ecosystem preservation**
- **Agriculture and food security**
- **Public health and sanitation**
- **Climate change adaptation**

Factors affecting watershed management

- 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 inhability**

f) Water resource and their capabilities.

Watershed management practices

In terms of purpose

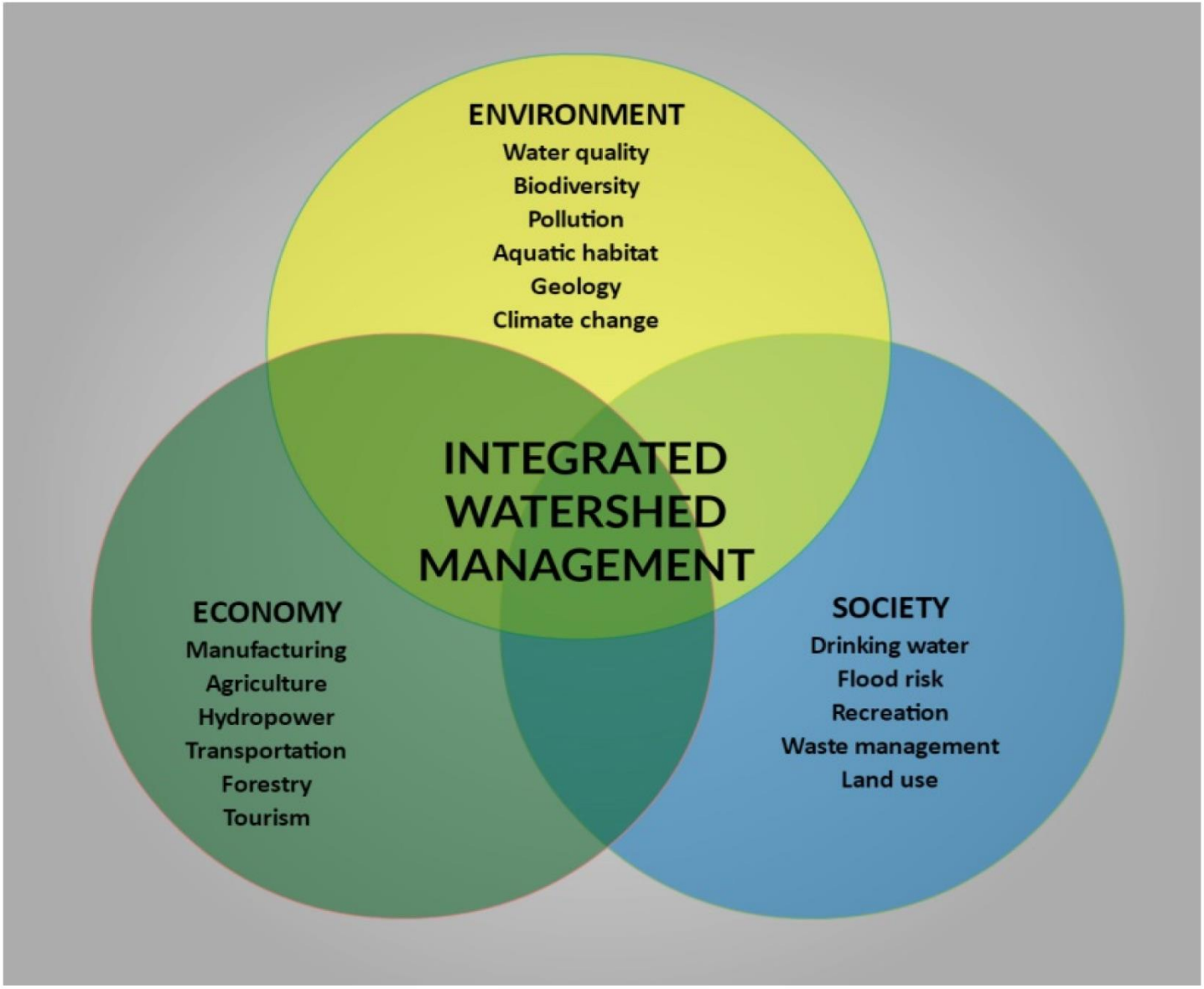
1. To increase infiltration

2. To increase water holding capacity

3. To prevent soil erosion

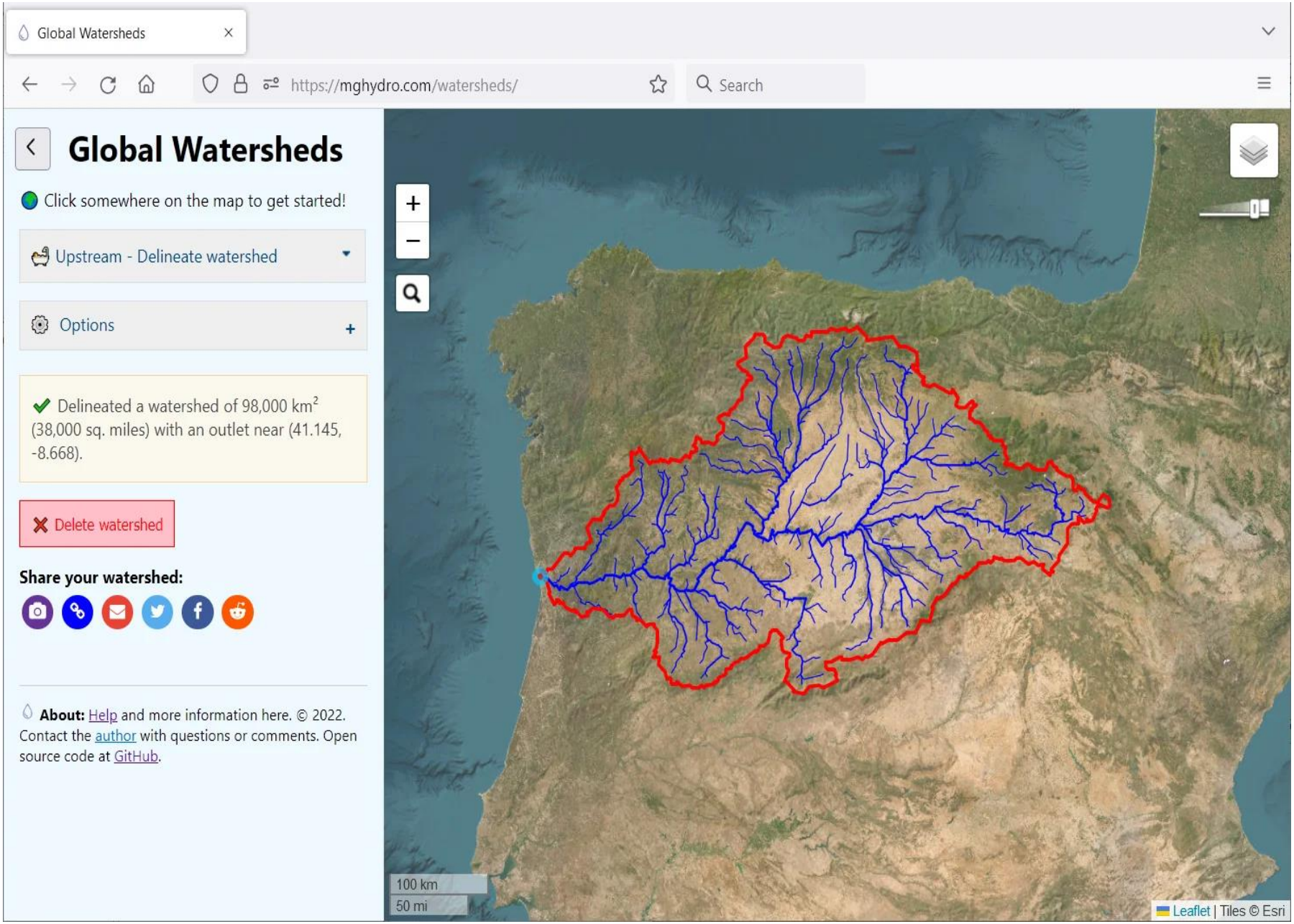
4. Method and accomplishment


provision of an adequate amount of drinking water
stabilising & protection of natural resources
maintenance of the quality of drinking water
Principles of WM
increasing of productivity of resource use in sustainable manner
participation of local community
harmonising economic development with environmental requirements


ENVIRONMENT
Water quality
Biodiversity
Pollution
Aquatic habitat
Geology
Climate change
INTEGRATED WATERSHED MANAGEMENT
ECONOMY
Manufacturing
Agriculture
Hydropower
Transportation
Forestry
Tourism
SOCIETY
Drinking water
Flood risk
Recreation
Waste management
Land use

Watershed Delineation

- All watershed delineation means is that you're drawing lines on a map to identify a watershed's boundaries.
- These are typically drawn on topographic maps using information from contour lines.
- Contour lines are lines of equal elevation, so any point along a given contour line is the same elevation.


Global Watersheds
https://mghydro.com/watersheds/
Search
Global Watersheds
Click somewhere on the map to get started!
Upstream - Delineate watershed
Options
Delineated a watershed of 98,000 km² (38,000 sq. miles) with an outlet near (41.145, -8.668).
Delete watershed
Share your watershed:
About: Help and more information here. © 2022. Contact the author with questions or comments. Open source code at GitHub.
100 km
50 mi
Leaflet | Tiles © Esri

Why should we delineate and map watersheds?

- Watershed delineation is an important concept as watersheds are the unit of study in hydrology.
- Land cover and land uses within watersheds affect the hydrologic cycle or the flow of water in that area.
- Defining a watershed boundary is the first step in determining a watershed's characteristics.

- The delineated boundaries form the nucleus around which the management **efforts such as land use, land change, soil types, geology and river flows are analyzed and appropriate conclusions drawn.**