Sparks Academy

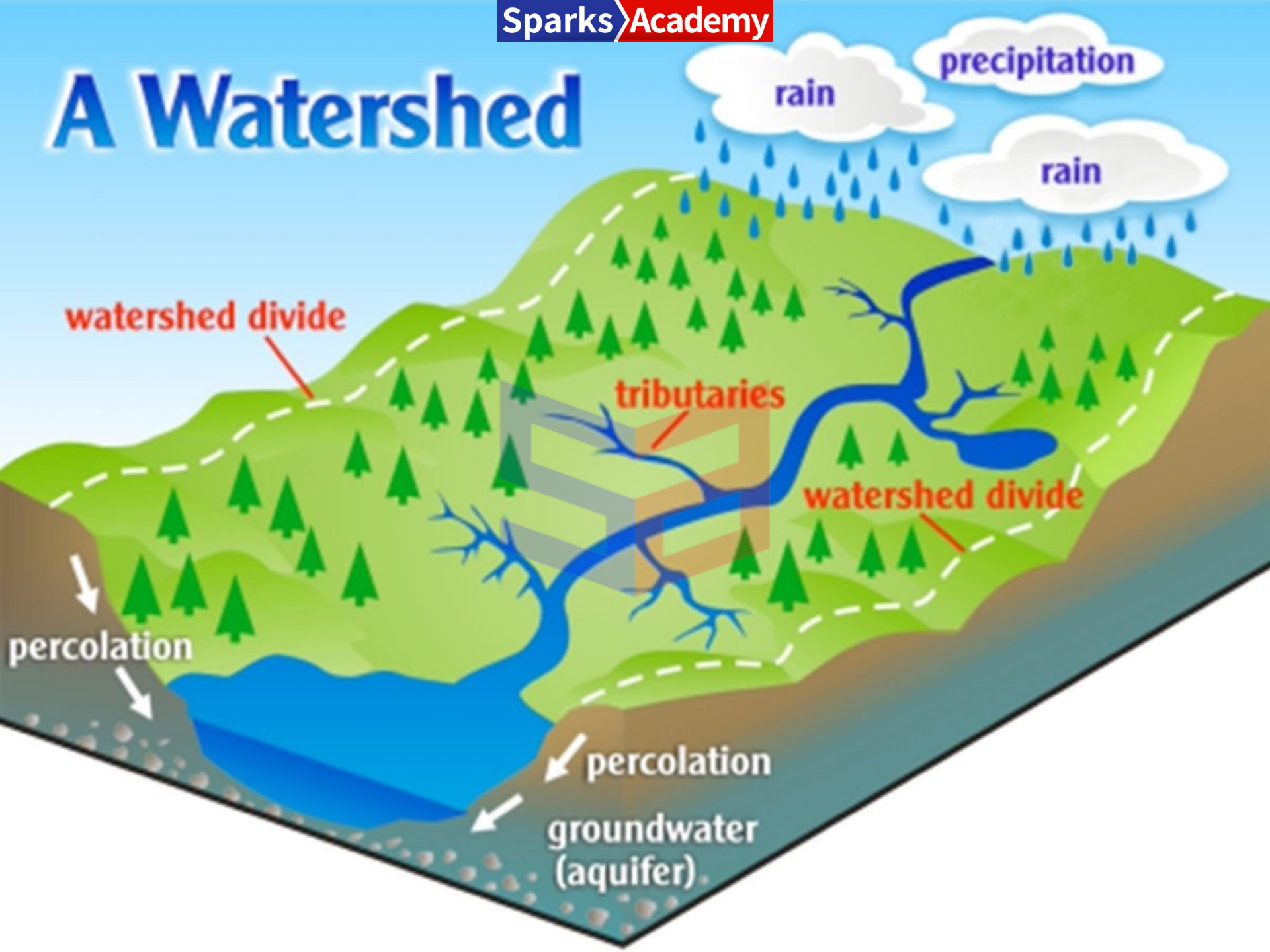
WATERSHED MANAGEMENT & LAND CAPABILITY CLASSIFICATION

PRESENTED BY
GOMATHI.B

WATERSHED

- It is a Geo hydrological unit

- A watershed is an area of land where all the rainwater or surface water drains into a common outlet such as a river, lake, or stream.



OBJECTIVES OF WATERSHED

- Soil and water conservation
- Improved agricultural productivity
- Sustainable livelihoods for local communities
- Groundwater recharge and surface water retention
- Biodiversity conservation
- Mitigation of natural disasters like floods and droughts
- Sustainable Agriculture & Forestry

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 to10000 Hect)
- Micro watershed (100 to 1000 Hect)
- Mini watershed (1-100 Hect)

Benifits of watershed management

- To control damaging runoff and degradation and there by conservation of soil and water.
- To protect, conserve and improve the land of watershed for more efficient and sustained production
- To rehabilitate the deteriorating lands.
- To increase infiltration of rainwater
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- To enhance the ground water recharge

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

e) Social status of inhability

f) Water resource and their capabilities.

Concepts of Watershed

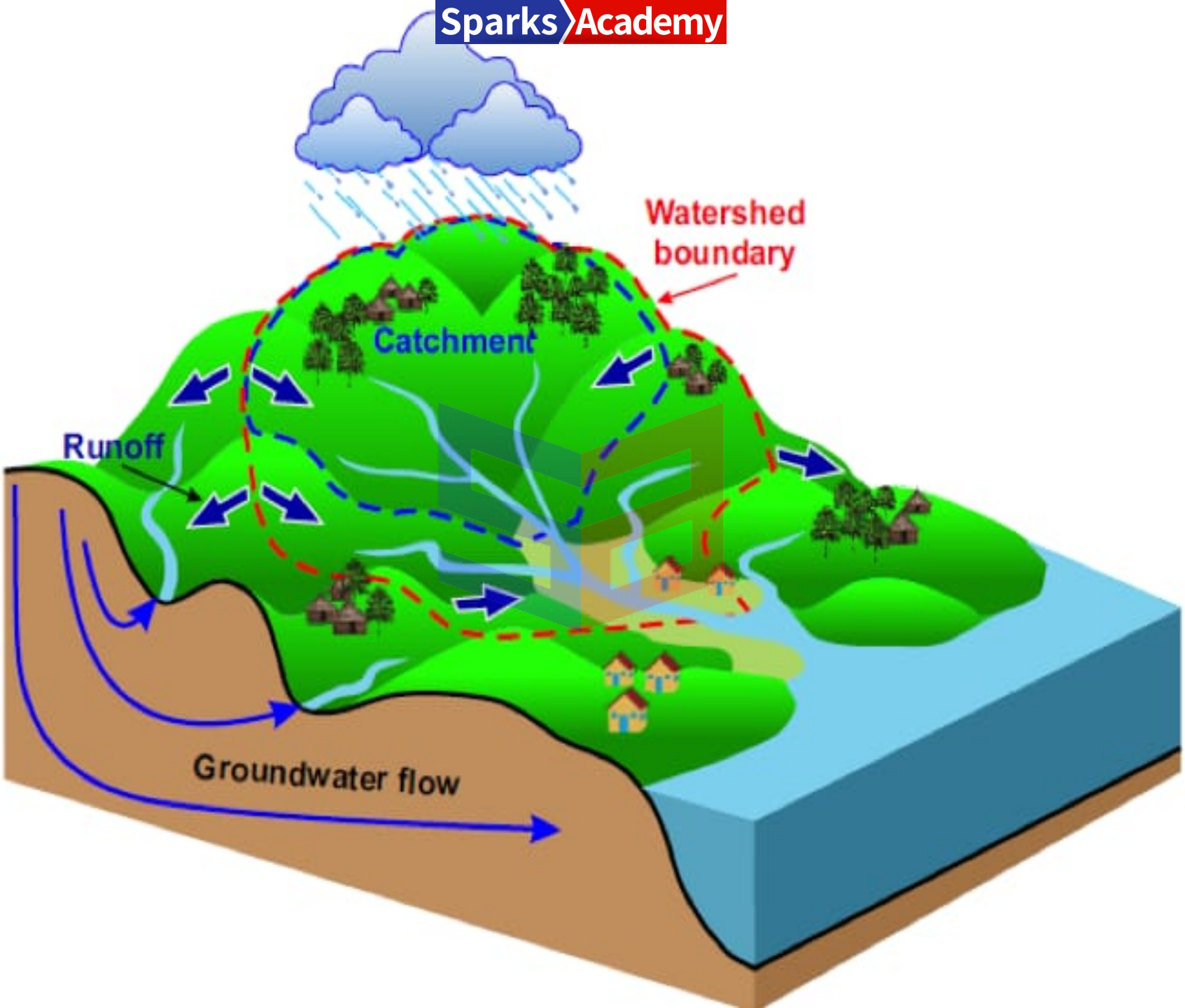
1. Watershed

- A land area that collects and drains water to a single point (stream, river, or lake).

2. Catchment Area

-Another term for watershed.

-The area from which water is collected.



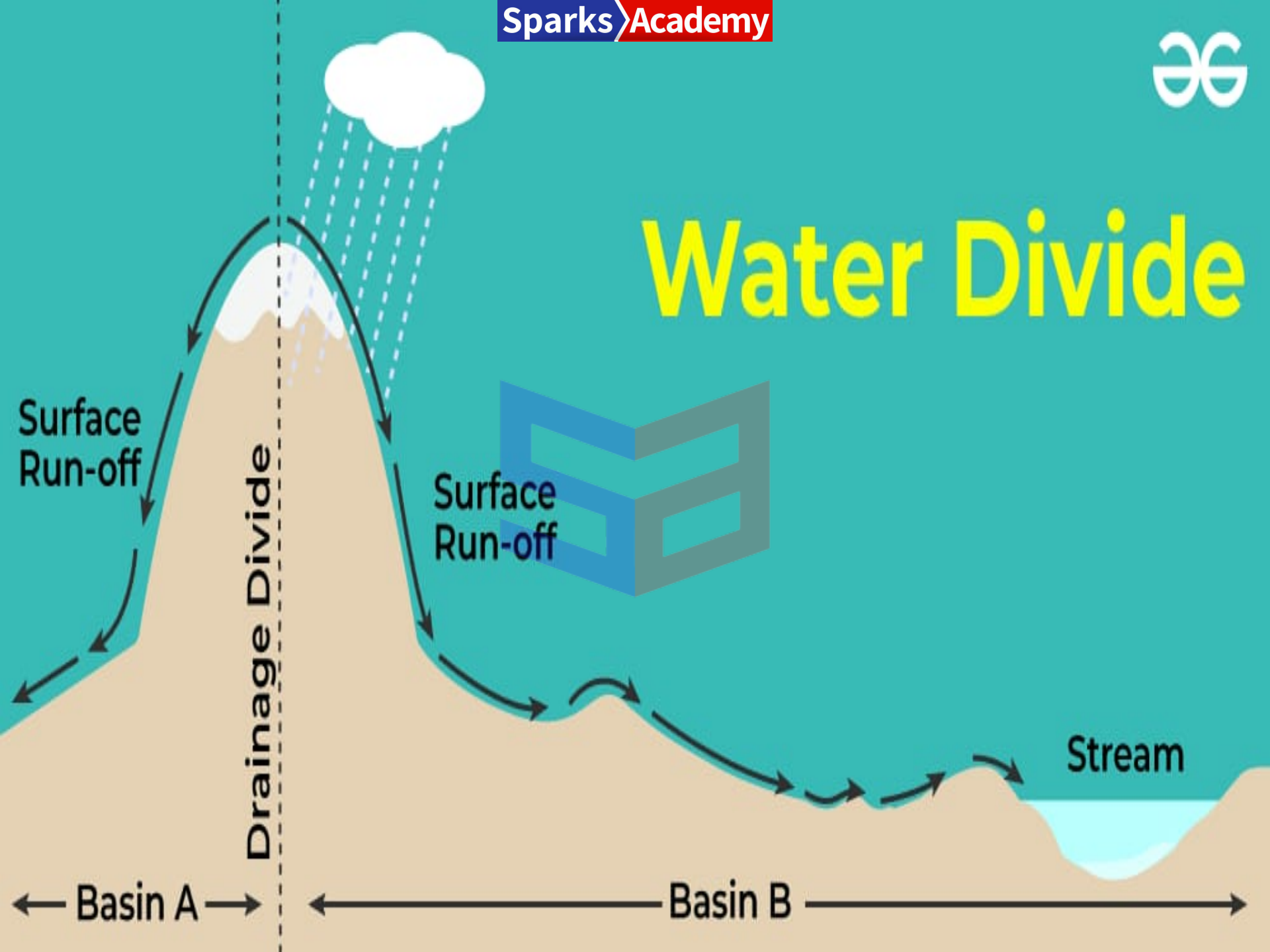
3. Drainage

- The natural flow of water over land through streams and rivers.

4. Drainage Divide (Ridge)

- A higher land area that separates two watersheds.
- Water falling on either side flows in different directions.

Water Divide



5. Runoff

Water that flows over the land surface after rainfall.

6. Infiltration

The process by which water enters the soil.

7. Percolation

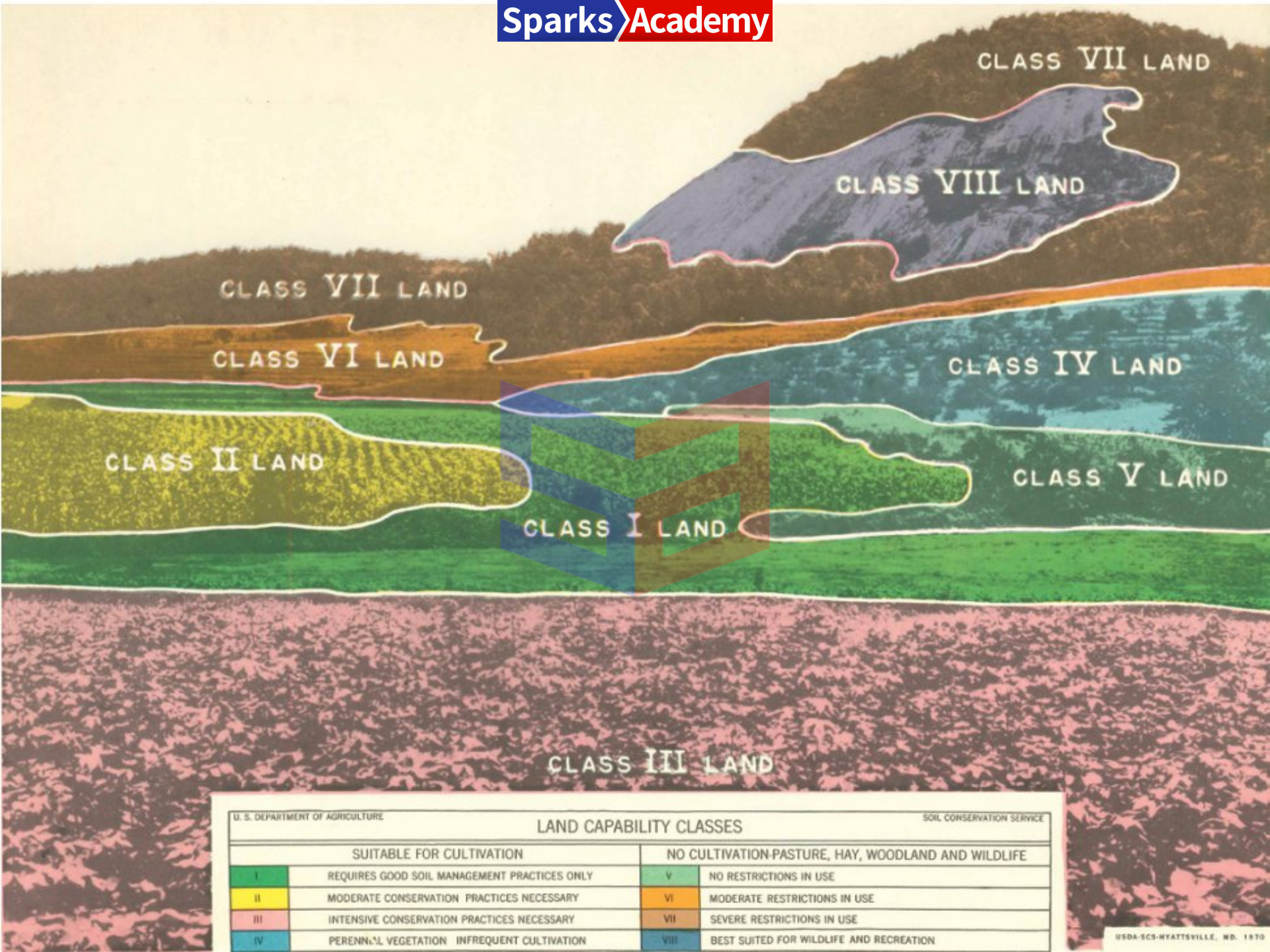
Movement of water deeper into the soil layers.

Definition

- Land Capability:- The suitability of land for use without damage.
- Land Use Capability Classification:- A systemic grouping of different kinds of land for sustained productivity.

Land capability Classification

- Land capability class is indicated on the maps by roman numerals I to VIII or by standard colors or by both.
- Lands are mainly used for agriculture, pastures and forestry.
- Depending on the nature and properties of soils, they are suitable for one or other uses.
- Based on the capability or limitations, the lands are grouped into eight classes by the U.S soil conservation Services.



U. S. DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

LAND CAPABILITY CLASSES

SUITABLE FOR CULTIVATION		NO CULTIVATION-PASTURE, HAY, WOODLAND AND WILDLIFE	
I	REQUIRES GOOD SOIL MANAGEMENT PRACTICES ONLY	V	NO RESTRICTIONS IN USE
II	MODERATE CONSERVATION PRACTICES NECESSARY	VI	MODERATE RESTRICTIONS IN USE
III	INTENSIVE CONSERVATION PRACTICES NECESSARY	VII	SEVERE RESTRICTIONS IN USE
IV	PERENNIAL VEGETATION INFREQUENT CULTIVATION	VIII	BEST SUITED FOR WILDLIFE AND RECREATION

USDA-SCS-HYATTSVILLE, MD. 1970

Land capapbility Classification

- First four classes are differentiated based on the extent of

- 1. Soil slope
  2. Erosion
  3. Depth
  4. Structure
  5. Soil Reaction
  6. Drainage

- Next four classes are not capable of supporting cultivation of crops but for growing grasses, forestry and supporting wildlife.

Land capapbility Classification

- Land suitable for cultivation

Class 1 - Very good land
Class 2 - Good land
Class 3 - Moderatively good land
Class 4 - Fairly good land

Arable land (Land Suited For Agriculture)

Class I:- Very good land (Green Colour)

- Slope 0-1%
- Nearly level and has deep soil, good internal, and good surface drainage
- Land can be cropped every year without special practices to control erosion
- Best suitable for all agricultural crops
- Deep soil depth and high fertility
- Not affected by any appreciable erosion, wetness, salinity etc.

- **CLASS II:- Good land (Pale green/Yellow Color)**
- Slope 1-3%
- Requires moderate attention to conservation practices
- Contour bunding and other easy to use practices are often used
- Have moderate soil depth, light or heavy texture, gentle slope and moderate soil fertility etc.
- Suitable for permanent cultivation with some soil and water conservation practices.

- **Class III:- Moderately good land**
- Slope 3-5%
- Found on gently sloping hills
- Crops must be more carefully selected

  -Plant cover should be maintained
- Increased attention must be given to conservation practices
  -Terraces and strip cropping
  -Contour bunding, graded bunding
- It can be productive with proper management by the producer

Class IV:- Fairly good land (Blue Color)

- Slope 5-8%
- Hilly lands and lowest preference for cultivated
- Requires special conservation management practices
- Frequently subject to erosion (gullies)
- Suitable only for occasional or limited cultivation
- Engineering measures are recommended here

- Land Not suitable for cultivation

Class 5 -
Class 6 - Suitable for Pastures and grazing
Class 7 -

NON-ARABLE LAND (Not suitable for cultivation)

Class V:- Unsuited for cultivation (Dark Green)

- Slope 8-12%
- Used for pasture crops, cattle grazing, hay crops and tree farming
- Often used for wildlife and recreation areas
- The soil typically has good tilth and fertility
- Have the potential to become class I, but due to particular problem/hazard, they can't fulfill the characeritistics of class I

- **Class VI:- Not suited for row crops (Orange Color)**
- Slope 12-18%.
- Suitable for horticultural crops like mango, coffee, guava, cashew nut etc.
- Grazing should be regulated to preserve the plant cover
- The soil may fair productivity if it has not been damaged by erosion
- Gullies often quickly from if not carefully managed

Class VII:- (Brown Color)

- Slope 18-25%
- Highly unsuited for cultivation.
- Best uses are permanent pasture, forestry, and wildlife.
- Generally lands are droughty and swampy, having very steep slope, rough, stony or very severely eroded, infested with gullies.

Class 8 - Suitable for wild life and watershed

Class VIII:- (Purple/Violet)

- Slope greater than 25%
- Unsuited for plant production
- The soil may be wet and high in sand or clay
- Often used for waterfowl habitat
- Lands are very rough, not suitable for wood land or grazing.

Land use planning

Land use planning is the process of deciding how land should be used in the best way to meet human needs while protecting natural resources.

OBJECTIVES OF LAND USE PLANNING

- Proper and efficient use of land
- Prevent soil erosion and land degradation
- Improve agricultural production
- Protect forests, water, and environment
- Balanced development(rural & urban)
- Protection of natural resources(water,forest,wildlife)

TYPES OF LAND USE PLANNING

- Agricultural land - Crop production
- Forest land - Forest land
- Residential land - Residential land
- Industrial land - Industrial land
- Pasture/grazing land - Pasuture /Grazing land

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PRINCIPELS OF LAND USE PLANNING

- Capabilty
- Sustainablity
- Integrated approach (soil-water-climate)
- Conservation of resources & Environmental protection
- Economic efficiency(maximum economic benefit with minimum cost)
- social acceptability(to accept local people and communities)
- Flexibility(land,population)
- Participatory approach(Involve farmers and stakeholders)
- Optimum land use

STEPS OF LAND USE PLANNING

- Data collection – soil, climate, water, population
- Land evaluation – suitability of land for different uses(Land capability classification)
- Problem identification
- Planning & decision-making
- Implementation – applying the plan
- Monitoring & Evaluation

THANK YOU