

## UNIT 1

### INTRODUCTION TO IRRIGATION

#### 1.1. Definition of Irrigation

- Irrigation is the controlled application of water for agricultural purposes through man-made systems to supply water requirements which is not satisfied by rainfall.
- It may also be defined as the process of artificially supplying water to soil for raising crops.
- It involves planning, designing, construction, operation and maintenance of various structures required to water from the source to the field.

#### 1.2. Necessity of irrigation

- i. Non-uniform rainfall throughout the year
- ii. Less rainfall than water
- iii. Increasing demand of food
- iv. Controlled water supply
- v. Commercial crops with additional water requirement
- vi. Growing a number of crops during a year
- vii. Growing perennial crops
- viii. Different types of crops

#### 1.3. Advantages and disadvantages of irrigation

##### # Advantages of irrigation

- i. Increase in food production
- ii. Generation of hydropower
- iii. Elimination of mixed cropping
- iv. Flood control
- v. General Development of country
- vi. Inland navigation
- vii. Increased value of land
- viii. Water supply for domestic and industry use.

##### # Disadvantages of Irrigation

- i. Water pollution
- ii. Creation of breeding place for mosquitoes
- iii. Over irrigation causes water logging
- iv. Expensive to construct irrigation structures
- v. Damp climate

#### 1.4. Sources of water for irrigation

##### i) Surface water sources

- River
- Pond
- Lakes
- Reservoir

##### ii) Ground water sources

- Open well
- Tube well
- Infiltration Galleries.

# Infiltration gallery is a structure (like a horizontal drain) that is positioned below water table so that it collects ground water.

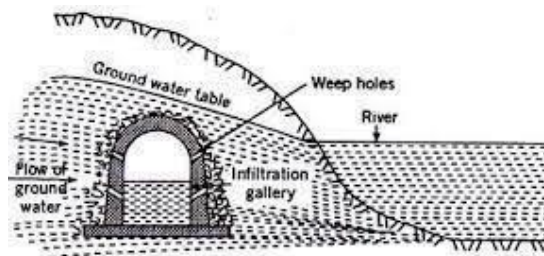


Fig. Infiltration gallery

#### 1.5. Gross Command Area (GCA)

- GCA is the total area bounded between total boundary of an irrigation project.
- It includes both cultivable as well as uncultivable land.
- It contains unfertile land (barren land), ponds, villages, forest, etc.

#### 1.6. Cultivable (Culturable) command area (CCA)

- The area utilized for growing the crops is called cultivable command area.
- It is also called culturable command area.
- Generally,  $CCA = 80\%$  of GCA.
- $CCA = GCA - \text{Uncultivable area}$

#### 1.7. Net Command Area:

- It is the CCA obtained after the deduction of canal network, supply ditches bund etc. constructed in the field.
- $NCA = CCA - \text{area occupied by canals, canal network, ditches, etc.}$