

# UNIT II

## IRRIGATION METHODS AND MANAGEMENT



PREPARED BY: PROF JAHAGIRDAR SAYYEDAZARA

(ASST. PROF : ANJUMAN - I - ISLAM'S KALSEKAR TECHNICAL CAMPUS, NEW PANVEL)

## UNIT II IRRIGATION METHODS AND MANAGEMENT

### **LEARNING GOALS:**

Bandhara irrigation,

Percolation tanks,

Types of irrigation: Surface irrigation, Subsurface irrigation, sprinkler irrigation, drip irrigation.

Techniques of water distribution: free flooding, border flooding, check flooding, basin flooding, furrow irrigation method, micro irrigation,

Irrigation scheduling,

Participatory irrigation management

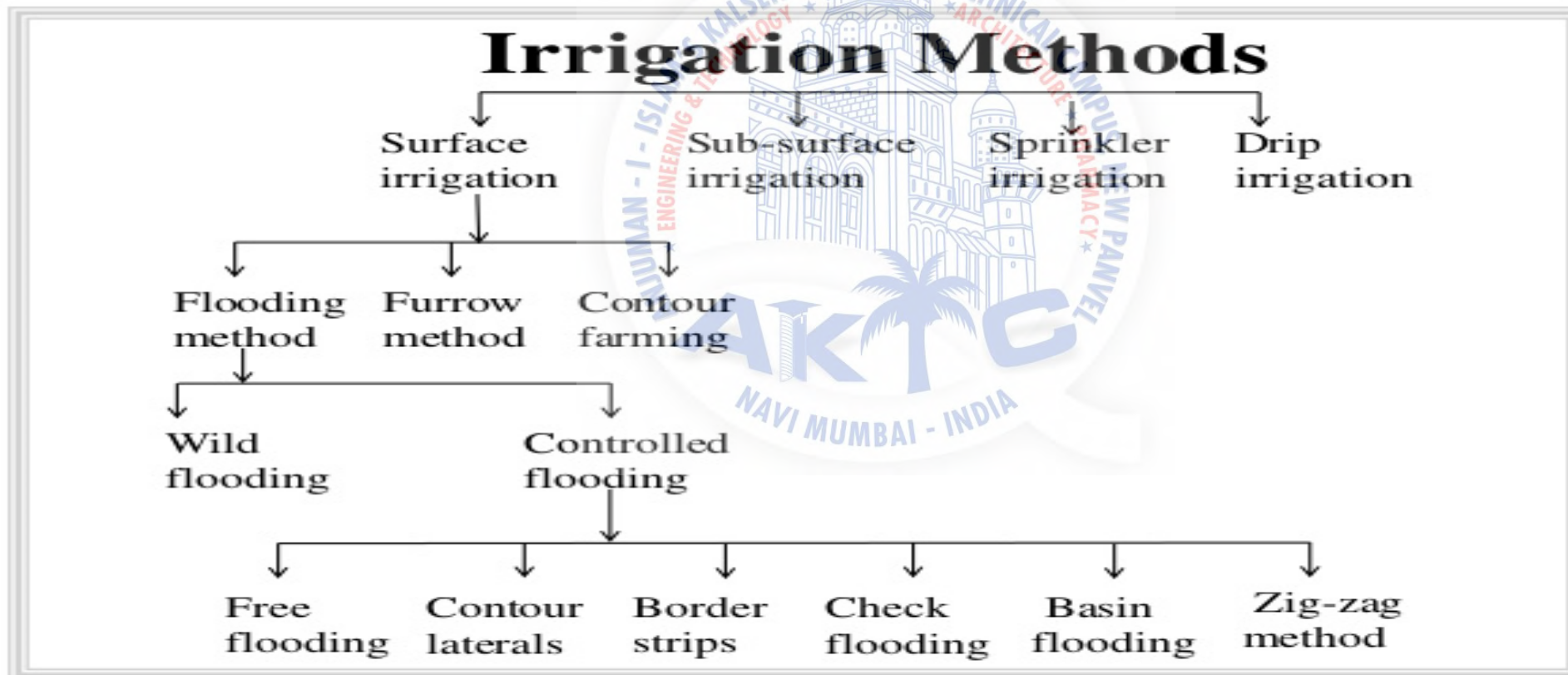
The logo of AIKTC (Atma-Insani-Karya Technical Campus) is centered in the background. It features a circular emblem with a building illustration in the center. The text around the circle includes "ISLAM'S KALSEKAR" at the top, "ENGINEERING & TECHNOLOGY" on the left, "TECHNICAL CAMPUS" on the right, "ARCHITECTURE" and "PHARMACY" at the bottom right, and "NAVI MUMBAI - INDIA" at the bottom. The acronym "AIKTC" is prominently displayed in the middle of the circle.

**“Various methods of application  
of irrigation water.”**

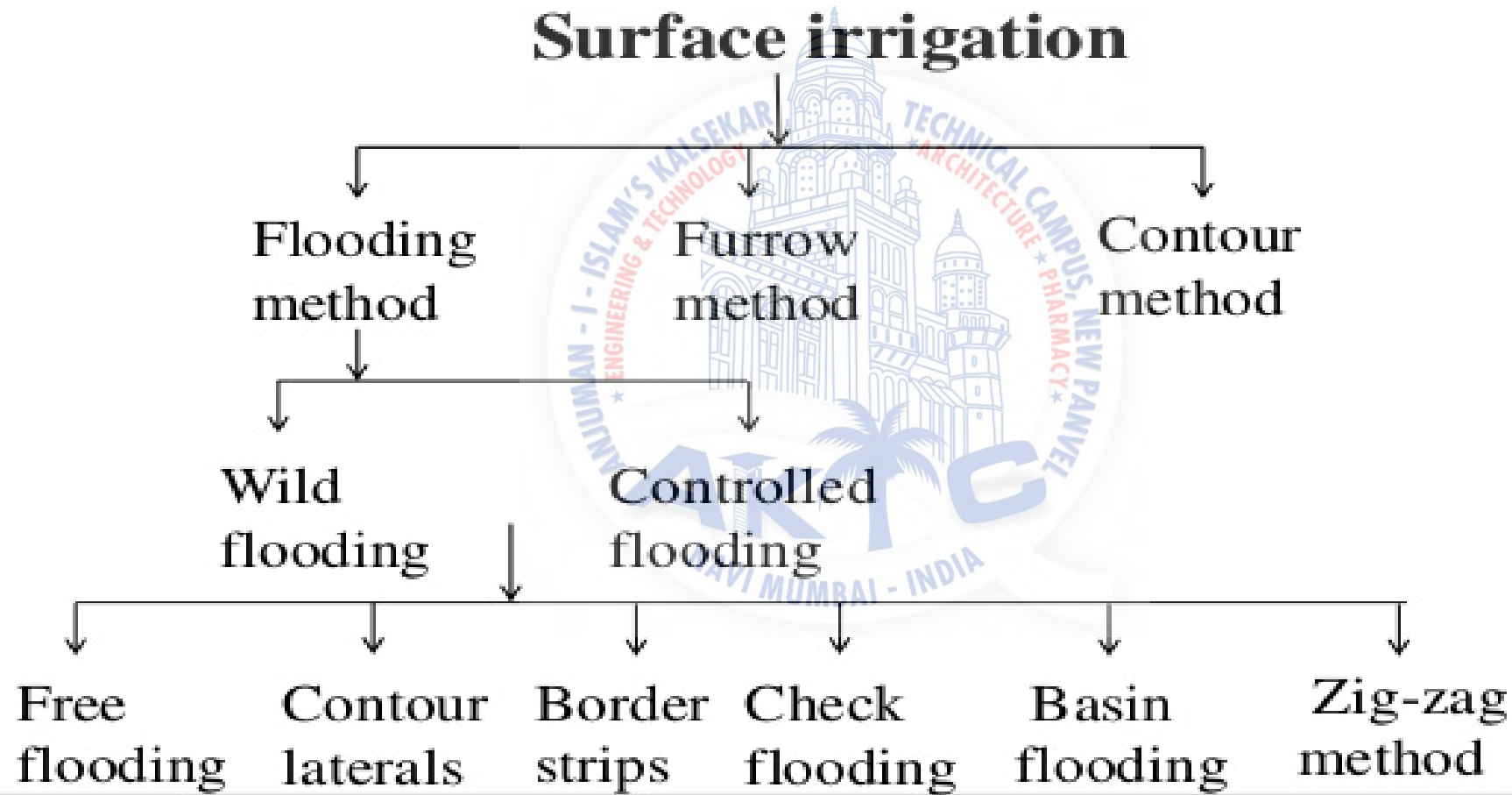
## ➤ ***Factors affecting choice of irrigation method.***

- ✓ The selection of the irrigation method is based on the following factors.
  1. Soil characteristics of the land to be irrigated.
  2. Topography of the area.
  3. The available water supply.
  4. Type of crop and its requirements.
  5. Size of the stream supplying irrigation water.
  6. Amount of water required in each irrigation.

# IRRIGATION METHODS



## ➤ Surface irrigation method.



## ➤ *Surface irrigation method.*

- ✓ In surface irrigation methods, the irrigation water is applied by spreading in the form of sheet or small streams on the lands to be irrigated.
- ✓ The surface irrigation is further divided as follows:
  - 1) Flooding method.
  - 2) Furrow method .
  - 3) Contour farming.

## ➤ *Surface irrigation methods.*

- ✓ All the above methods of the surface irrigation are adopted for the perennial irrigation system.
- ✓ The inundation irrigation system adopts only the wild or uncontrolled flooding method of irrigation.



## ➤ *Wild flooding method.*

- ✓ Wild flooding method is the earliest and the primitive method of application of water to the land.
- ✓ In this method the water is applied by spreading it over the land prior to the application of water, no land preparations is done in the form of border or field ditches.
- ✓ The water is allowed to flow the natural slope of the land.

## ➤ ***Controlled flooding.***

- ✓ In controlled flooding methods irrigation water is applied by spreading it over the land to be irrigated with proper control on the flow of water as well as the quantity of water applied.
- ✓ All the methods of control flooding require prior preparation of the land.
- ✓ The land is properly graded & agricultural fields are divided into small units by levees .

## ➤ ***Controlled flooding.***

- ✓ The various methods of controlled flooding are:
1. Free flooding.
  2. Contour laterals.
  3. Border strips.
  4. Check basins.
  5. Basin flooding.
  6. Zig-zag method.



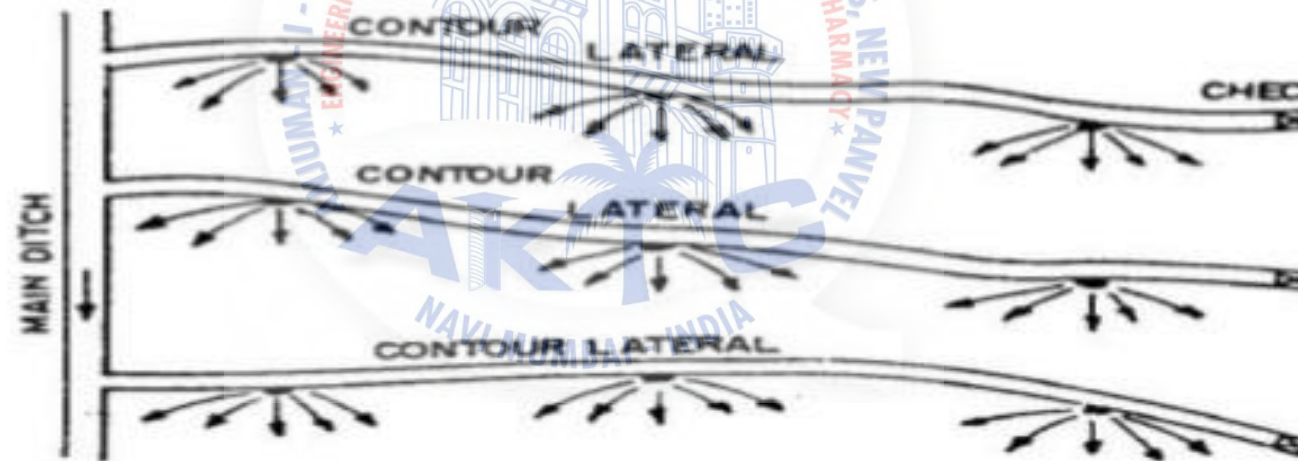
## ➤ Free flooding.

- ✓ Free flooding consists of dividing the entire land to be irrigated into small strips by a number of field channels or levees known as laterals.
- ✓ These laterals may be either at right angles to the sides of the field or at right angles to the contour lines .



## ➤ Contour laterals

- ✓ This is a special case of free flooding in which the field channels or laterals are aligned approximately along the contour lines.
- ✓ In this method, irrigation is possible only on side of the laterals.



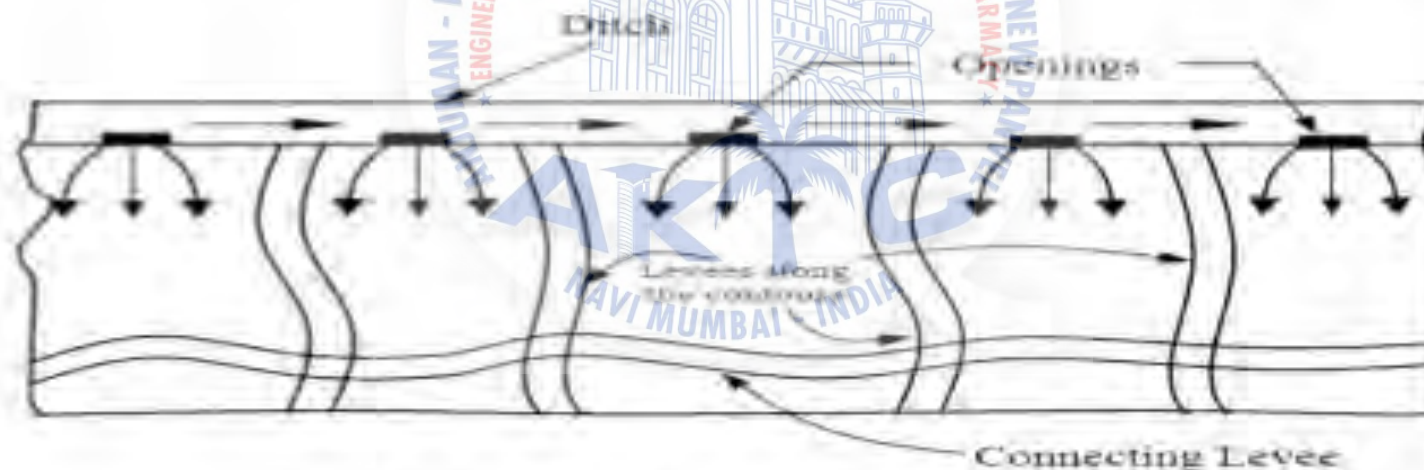
## ➤ **Border strips**

- ✓ In this method, the agricultural area is divided into series of long narrow strips known as border strips by levees, i.e. small bunds.
- ✓ This method is suitable when the area is at level with gentle slope.



## ➤ Check flooding

- ✓ In check flooding the crop area is divided into some plots which are relatively leveled by checks or bunds.
- ✓ Water from field channels is allowed to enter to each plot or check basin and the plots are flooded to the required depth.



**Fig: Check flooding (Plan view)**

## ➤ Basin flooding

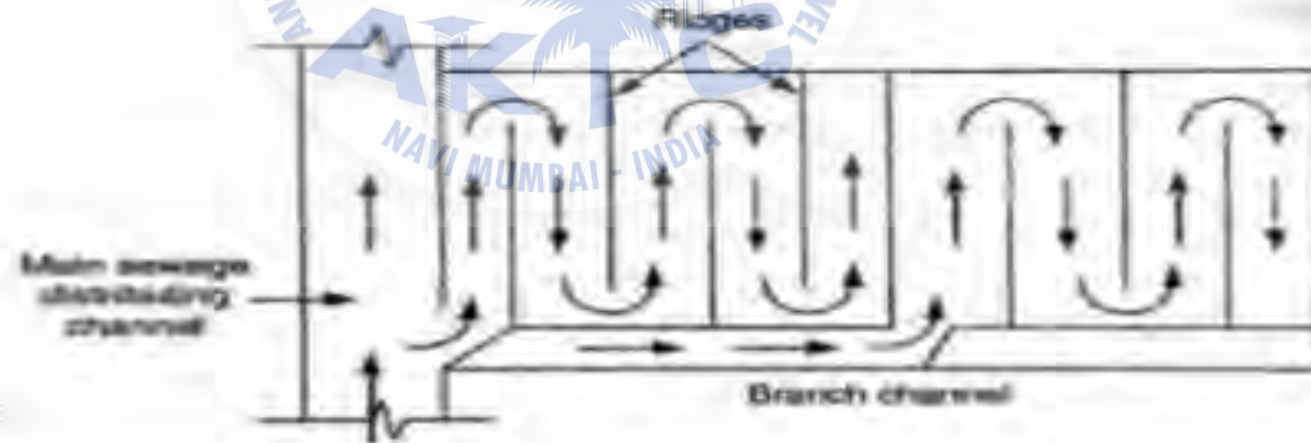
- ✓ This method is used frequently to irrigate the plantations. It is a special type of check flooding method.
- ✓ Each plant is enclosed by circular channels which is called basin. Basins are connected to small field ditches.
- ✓ Ditches are fed from the main supply channel.





## ➤ Zig-zag method

- ✓ In this method, the agricultural area is sub-divided into small plots by low bunds in a zig-zag manner.
- ✓ The water is supplied to the plots from the field channel through the openings.
- ✓ The water flows in a zig-zag way to cover the entire area. When the desired depth is attained, the openings are closed.



## ➤ Furrow method.

✓Furrow irrigation avoids flooding the entire field surface by channeling the flow along the primary direction of the field using 'furrows,' 'grooves,' 'lines'.



## ➤ Furrow method

## ➤ Contour farming

- ✓ Contour farming is practiced in hilly areas with slopes and with falling contour.
- ✓ The land is divided into series of horizontal strips called terraces.
- ✓ Small bunds are constructed at the end of each terrace to hold water up to equal height.



## ➤ Contour farming

## ➤ *Sub-Surface irrigation method.*

- ✓ Subsurface drip irrigation (SDI) is the irrigation of crops through buried plastic tubes containing embedded emitters located at regular spacings.
- ✓ The sub surface irrigation method consists of supplying water directly to the root zone of the plants.

## ➤ *Sub-Surface irrigation method.*

- ✓ The favourable conditions for sub surface irrigation:
1. Moderate slope.
  2. Uniform topographic condition.
  3. Good quality of irrigation water.
  4. Impervious sub-soil at reasonable depth. (i.e. 2-3 m depth).

## ➤ *Sub-Surface irrigation method.*

- ✓ The subsurface irrigation methods can be classified as follows:
1. Natural sub-surface irrigation.
  2. Artificial sub-surface irrigation.

## ➤ Sprinkler irrigation

- ✓ Sprinkler irrigation is a method of applying irrigation water which is similar to natural rainfall.
- ✓ Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air through sprinklers so that it breaks up into small water drops which fall to the ground.



## ➤ Sprinkler irrigation

## ➤ Drip irrigation.

- ✓ Drip irrigation is also known as trickle irrigation .
- ✓ It is one of the latest developed methods of irrigation which is more popular in the regions facing scarcity of water.
- ✓ This method was first introduced in Israel.
- ✓ In India this method is more useful in areas in Gujarat, Maharashtra, Kerala, & Karnataka.

