Certificate on PIM Training Course

Module 5- Introduction to Canal System, Definitions and Units

Topic 5.3: Technical vocabulary related to canal operation



Gross Command Area (G C A) or Whole Command Area – An area irrigated by any canal engulfing roads, lakes, habitats are called G C A of the canal. Boundaries of gross command touch any river, rivulet, drainage channel or drain.



Figure - 1: Gross Command Area of a canal system

Culturable Command Area (C C A): - Irrigable area of any canal (Main, Branch, distributary & Minor) system within its Gross Command, barring habitat, roads, drainage etc is termed as Culturable Command Area of the system. For example if a minor having its gross command area (G C A) of 450 hectare engulfing a habitat, road etc non-agricultural area of 160 hectare then its culturable command area (C C A) will be 450-160= 290 hectare.

Do Yourself

Exercise: - An outlet has a G C A of 100 hectare and has non- agricultural area in shape of gool, chak roads etc of 35 hectare, how much its C C A will be?

Proposed Irrigation Area or P P A- A certain percentage of cultivable area (C C A) is proposed to be irrigated by the canal water in a particular crop season is termed as P P A determined in consideration of various factors. It may differ

from project to project. It is determined crop season wise. Cropping pattern being adopted in the area and type of soils guides the decision in proposing PPA. Prevention of waterlogging conditions is also kept in mind while deciding PPA. For example, in Sarda Sahayak Project in UP has PPA 115% of CCA (67% in Kharif & 48% in Rabi) whereas it is 70% in Lower Ganga Canal system (34% Kharif and 36% Rabi). of CCA.

If in a village C C A of any canal is 200 hectare and in Rabi season only 80 hectare is proposed to be irrigated in original design of canal and 140 hectare is proposed to be irrigated in Kharif then how much is its P P A in Rabi and Kharif separately and how much be total P P A of system?

Answer: It is to be noted that P P A is shown in percentage, therefore it will be 40% and 70% respectively and total P P A will be the sum of the two (40+70) =110%

Exercise: - If a canal system covers a CCA of 150 ha and 40% area is proposed to be irrigated in Rabi, how much is its PPA in Rabi?

Irrigation Potential: - In case of canals sum of the PPAs of both the cropping seasons is termed as Created Irrigation Potential. Suppose a canal system has PPA 54% of CCA in Rabi and PPA 46% of CCA in Kharif then its potential will be 100% of CCA.

Do it yourself:

Exercise: - Compute irrigation potential if a system has a PPA of 56% in

Kharif and 39% in Rabi?

Cropping Intensity: - The ratio of sum of the areas sown in a year in both the crops to total command is known as cropping intensity. The times a command area sown in a year is termed as a cropping intensity of the command. Suppose a command is sown once a year then its cropping intensity will be 100 percent whereas if it is sown twice in a year the intensity will be 200 percent. The average cropping intensity of the country is around 146%, it means a field in

the command is sown on an average 1.46 times a year. India's cropping intensity at present is 146% which is being tried to be improved.

Do Yourself

Exercise: C C A of any command is 100 hectares. In this CCA Rabi crops are sown in 40 hectares and the kharif crops in 80 hectares, what will be the cropping intensity.

Cropping pattern: - Every canal is designed adopting a particular cropping pattern, it may be the cropping pattern prevailing in the area or an arbitrary one which is supposed to be adopted. Suppose in a canal command Paddy along with jowar, bazara, wheat, pea, gram, lintel and mustard then this is the cropping pattern of that canal system basing on it the water requirement of area is computed and discharge of the canal is fixed adding losses of transmission in it.

In Sarda sahayak canal system of U.P. in kharif P P A is 67% but demand is calculated supposing 33% paddy in it and in rabi out of 48% P P A demand is computed supposing 27% wheat. In the same way in Lower Ganga Canal system of U.P. out of 34% of P P A in Kharif Paddy is 19% and wheat is 27% out of 36% P P A in Rabi.

Roster: - Most of the canal system is constructed by diverting river water to canals. The rivers have heavy variation in discharges flowing in them due to seasonal variations. The canal discharges are designed considering demand which depends upon the cropping pattern and PPA of the system and almost same throughout the season. Due to variation in discharge availability engineers are bound to run the canals one by one for maintaining equability termed as roster. In case of reservoir fed canal roster is bound to be followed according to demand of farmers and availability of water in reservoir.