



CLASSIFICATION OF CANALS:

The canals can be classified in several ways. All the possible classifications are given as follows:

1. Classification Based on Financial Output:

Under this classification canals may be divided into two types:

- (i) Protective canal.
- (ii) Productive canal.

(i) Protective Canal:

The purpose of protective canal is to protect the areas most prone to famines. The canals are constructed having all the permanent works required for their regulation. No discharge of water is left in them under normal conditions. But whenever famine conditions are anticipated due to shortage or no rains, these canals are cleared by employing labour at a short notice and water is run in them to provide water for drinking as well as irrigation purposes. These canals do not give any revenue to the state.

2. Classification Based Upon the Nature of Source of Supply:

Under this classification, the canal can be divided into two categories:

Under this classification, the canal can be divided into two categories:

- (i) Permanent canals.
- (ii) Inundation canals.

(i) Permanent Canals:

When canals are fed regularly or continuously, from a permanent source, such canals are known as permanent canals. Permanent canals have a regular, well defined section. They have permanent concrete masonry regulation works. Such canals run practically throughout the year. Such canals are also sometimes known as Perennial canals. These canals are closed only when either some construction is to be carried out over them or silt clearance is to be done. These canals always take off from ice fed perennial rivers

(ii) Inundation Canals:

These are such canals which run only for the duration, during which water level in the river remains above some specified level. These canals do not have a very regular section and structures like falls etc. They are not provided with any diversion works in the river, in form of weir or barrage. They however have a head regulator.



3. Classification Based Upon the Purpose of the Canal:

An elaborate network of irrigation canals consists of following categories of canals:

- (i) Main canal.
- (ii) Branch canal.
- (iii) Distributary.
- (iv) Minor.
- (v) Water course

All these canals are made for some specific purpose. Irrigation canals supply irrigation water to fields and water supply channels supply water to cities for drinking purpose. Power generating canals carry water to run generating unit and Navigation canals are used for the purpose of augmenting the inland transportation. Carrier canals do irrigation and, side by side carry water for other canals. Feeder canals are constructed to feed two or more smaller canals.

4. Classification Based Upon the Relative Position in a Given Network of Canals.

An elaborate network of irrigation canals consists of following categories of canals:

- (i) Main canal.
- (ii) Branch canal.
- (iii) Distributary.
- (iv) Minor.
- (v) Water course

(i) Main Canal:

This canal takes off directly from a river or reservoir. It is generally very big. Being too big, direct irrigation is generally not done from it except in exceptional circumstances. It acts as a carrier to feed branch canals or major distributaries.

(ii) Branch Canals:

Irrigation area for big canals is generally very large. It may not be possible to supply irrigation water from one canal. In such circumstances the main canal is bifurcated into two or more parts, which are known as branch canals. Each branch canal is assigned to the task of irrigating specified area.

Discharge of each branch canal is decided depending upon the area to be irrigated by each. Branches also carry quite large discharges and as such direct outlets should be given to lonely higher spots only lying along the alignment which cannot be irrigated from the distributaries. Branches act as feeder canals for distributaries.



(iii) Distributaries.

Distributaries are channels carrying small discharges of say $\frac{1}{2}$ to 7 cumecs. They usually take off from branch but they can also be taken from main canal, but their discharge has to be smaller than branch canal, otherwise they will become branches. The most of the irrigation is carried out by distributaries. Outlets are located at regular intervals and water is supplied to the fields.

(iv) Minors:

They are also sometimes called minor distributaries. They take off either from branch or distributaries. Mostly they take off from distributaries. Mostly area lying along the branches is quite high and cannot be irrigated by distributaries. In that case, a small minor is also taken off from the head works of some distributary and this minor is run along the branch canal.

Outlets to the area lying in the vicinity of the branch are given from the minors. There may be some areas lying very low or area may be located quite far off from the distributary. In that case such areas may be irrigated by providing minors from distributary. Minors carry hardly discharge for 10-15 outlets. Hence its discharge may be from 0.25 to 0.50 cumec.

(v) Water Course:

They are small channels that ultimately carry water to the fields from outlets. Water courses are also sometimes known as gools. They may be Pucca or lined. Nowadays stress is being given for lining of canals and water courses, as lot of precious irrigation water is otherwise lost in percolation. Outlets are usually taken from distributaries and minors, but they can be taken from branches also but only in special circumstances

5. Classification Based on the Alignment.

Depending upon the alignment they follow, the canals can be classified into following three categories:

- (i) Contour canal.
- (ii) Ridge or water shed canal.
- (iii) Side slope canal.

6. Classification Based Upon the Material of Construction:

Under this category the canals may be-

- (i) Kucha or unlined canals.
- (ii) Lined canals.

(i) Kucha or Unlined Canals:

The canal which runs through the natural soil of the region, is known as Kucha canal or unlined canal. The section of such a canal is trapezoidal. The side slope of the banks depends



upon the nature of soil. Slopes vary from 1:1 to 2:1 in cutting and 2:1 to 3:1 in filling for general soils like soft clay, alluvial soil, sandy loam etc.

These canals have to be run with restricted velocity so that erosion or scour may not take place. Large amount of water is lost by percolation. Most of the canals in India are Kucha canals. But government is aware of the shortcomings of such canals and laying more and more emphasis on lining the existing as well as new canals.

(ii) Lined Canals:

The section of such a canal in pucca section, made of some strong and impervious material. Lined canals can be run with large velocities and as such section of the canal can be considerably reduced, thus causing economy in the earth work. Lined canals do not allow any percolation loss, and wherever smaller areas being exposed; evaporation losses are also considerably reduced.

The irrigation water saved by lining of the canals can be used to provide irrigation facilities to additional areas. Lined canals have more bed slope and thus lot of command, is lost as the level of water is depressed faster.

Sources of water are limited and to provide irrigation facilities to larger areas, judicious use of available water is very essential. Hence a lined canal is the need of the time. If we analyse the benefits of lining of canals on long term basis, we can easily conclude that benefits would outweigh the expenditure incurred for lining.