

be provided by the water bodies.

Note: (a) Latent heat of vaporization of water.
 $H_2O = 585 \text{ K/gram.}$

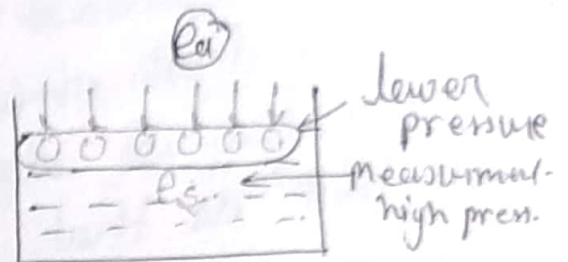
(b) A Evaporation is the cooling process in which water molecules starts to release their temperature.

$E \propto (e_s - e_a)$ — Dalton's equation of evaporation

where E — Evaporation

e_s — Saturated evaporation/
vapour pressure

e_a — Actual pressure of air
which is just above the water surface.



$e_s > e_a \rightarrow$ Evaporation

$e_a > e_s \rightarrow$ No evaporation.

↓
condensation.

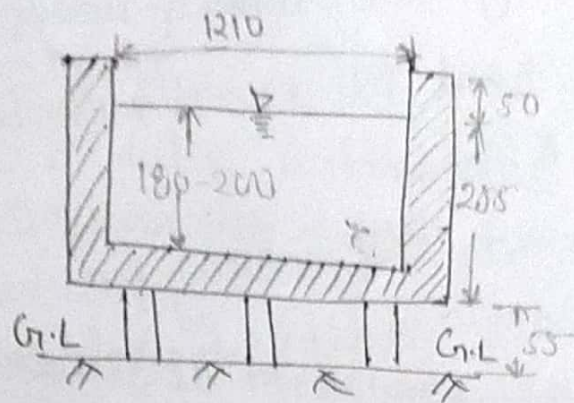
Evaporation.

Evaporimeters

Empirical Method

Analytical Method.

(1) Evaporimeters :- (a) Class-A pan method/
Land Pan Method



All dimensions are in "mm"

It is a standard pan of 1210 mm side in a cross section. In which depth of water is kept as 180 to 200 mm. and evaporation is allowed in same climatic condition in that as that in ~~the~~ water body for which which evaporation studies ^{being} in a line.

- Note :
- (1) This pan base used by us & whether burrow
 - (2) This is made up of G.I. sheet with bottom thickness of 55 mm.
 - (3) In case of corrosion monel ^{metal} ~~mettle~~ is used in G.I. sheet with bottom thickness of 75 mm.

(Monel ~~is~~ metal is a alloy of copper and nickel

(b) IS Pan { Indian Standard Pan } :- Confirmed by
IS: 5973-1970

The pan evaporimeter specified by IS ~~methe~~ is also known as modified class A standard pan.

The only different with class A pan is the the cross-section size for this pan is 1220. Rest all specification are exactly same.

Note! - This pan is made up of copper sheet of thickness 0.99 mm, ^{Thickness 0.99 mm} tinned inside and white painted on outer surfaces.

③ Colorado Pan:-
c/s Area = 920 mm^2
water depth = 460 mm
free board = 50 mm.

Note: ① The pan is made up of G.I. sheet and grounded within the 100 mm from ^{its} top.

② This pan is the superior method because the evaporation takes place due to same temp. ~~the~~ ~~the~~ ~~the~~ characteristics as that for lake.

The pan also has the some disadvantages:-

- ① Is not portable expensive to install extra care is needed to keep the surrounding area free from tall grass and etc.
- ② The service period of pan is reduced due to decrease in durability of material.

③ U.S.G

U.S Geological Survey Floating Pan :- This evaporation pan is of size having side of 900 mm and 450 to 460 mm depth of water. The pan is supported by float drums.

The measurement of evaporation is done during the floating condition of pan in the lake to create the exactly same situation of surface vaporization as that is developed in actual water body.

Note :- The pan also has a disadvantage that same surface heating effect are considered but re-radiation effect ~~by~~ are considered to from the ground level is ignored.

Pan Coefficient :- Evaporation pan are not exact model of large lake reservoir. Hence measurement of evaporation from evaporimeter can not be directly report as the evaporation from actual water body.

The pre dominant different b/w a evapor and actual water body is the difference in water depth.

In view of the above the evaporation ~~from~~ observed from pan has to be corrected to get the evaporation from the ~~to~~ water body under same climatic condition.

(pan coefficient - greater than 1 can)

Lake evaporation = $C_p \times$ Evaporation from Pan

↓
pan coefficient

Type of Pan	C. Pan Coefficient	
	Range of C_p	Avg. value of C_p
① Class-A pan	0.60 to 0.80	0.70
② IS Pan	0.65 to 1.10	0.80
③ Colorado Pan	0.75 to 0.86	0.78
④ U.S. Floating pan.	0.70 to 0.82	0.80

Note:- For shallow water bodies, the value of pan coefficient can be greater than 1.

Guidelines of W.M.D. for network of evaporimeter:-

- ① For arid Region → One evaporimeter per 30,000 km²
- ② For humid Region → One evaporimeter per 50,000 km²
- ③ For Cold Region → One evaporimeter per 1,00,000 km²

Note:- Till the end of year 2011 two evaporimeters were installed by IMD in the different part of country

Network Density of evaporimeter in India.

$$= \frac{\text{Area of India}}{\text{No. of evaporimeter}}$$