Procedure for estimation of soil moisture

Soil Water Balance model: The following formulae and conditions have been used for estimation of soil moisture

1. During the periods of deficient rainfall i.e P-PE is negative , the release of moisture is according to an exponential function

$$S = AWC * expe^{-ACC(P-PET)/AWC} \qquad (1)$$

   S: Moisture remaining in the soil as storage

   AWC is available water capacity (Difference between the field capacity and wilting point)

   P: Precipitation

   PET: Potential Evapotranspiration

   ACC: Accumulated

2. If Precipitation exceeds Potential evapotranpirationi.e P>PET then

$$S= \text{previous storage} + (P-PET) \qquad (2)$$

3. If Storage exceed Field capacity then

$$S= \text{Field capacity} \qquad (3)$$

4. Accumulated PET when S= Field capacity then

$$Acc(P-PET)=0 \qquad (4)$$

5. IN SWB model Soil storage has been calculated between two limits

   a. Upper Limit: Field capacity of the soil

   b. Lower limit: Wilting point of the soil

6. Soil Moisture is calculated in volumetric percentage varying between Field Capacity and Wilting point.

This methodology has been designed and developed jointly by India Meteorological Department and Department of Irrigation and Drainage Engineering , Mahatma Phule Krishi Vidyapeth (MPKV), Rahuri, Maharashtra, India.