

Research Paper :

## Water budget assessment of Agricultural University Akola Campus

C.B. KHOBRAGADE AND A.K. KAMBLE

Accepted : September, 2010

### ABSTRACT

The study was carried out to know the water resource potential and demand of the Dr.Panjabrao Deshmukh Agricultural University campus, Akola to assess the need of water conservation measures in order to maintain water need of the campus. The water potential of the campus was 453564.98 m<sup>3</sup>/yr, which comprised of surface run off (325616.1 m<sup>3</sup>/yr) and extractable ground water of 127948.88 m<sup>3</sup>/yr (75% of ground water recharge of 170598.5 m<sup>3</sup>/yr). On the other hand, the water demand of the campus was estimated as 188217.99 m<sup>3</sup>/yr that includes water demand of students and peoples (42887.5 m<sup>3</sup>/yr), animals (1980.49 m<sup>3</sup>/yr) and agriculture water need (143350 m<sup>3</sup>/yr) of the campus. It was observed that, water potential is more than the water need of the campus. Even then, due to lack of water conservation measures, the runoff water is getting out of the campus and creating a water shortage of 60269.11 m<sup>3</sup>/yr.

See end of the article for authors' affiliations

Correspondence to:

**A.K. KAMBLE**

Department of Agricultural Engineering, Krishi Vigyan Kendra, Sindewahi, CHANDRAPUR (M.S.) INDIA

**Key words :** Water conservation, Antecedent moisture condition, Surface runoff, Watershed

Soil and water are the two major natural resources essential for crop production. Efficient management and utilization of these resources is very important to increase the crop production and productivity per unit. One of the main objects of soil and water conservation measure is to conserve maximum possible rainwater in the soil to make efficient use of it and increasing the storage capacity of the profile to conserve the rainwater (Gawande *et al.*, 1997). A reduction in the huge runoff losses from land area will automatically means that more water will become available for retention as soil moisture. In Akola district, only 500 ha area (14%) is irrigated which is very low and most of the area (86%) under rainfed. The next alternative, therefore, is to concentrate on the best use of rainfall through water harvesting. The future of Indian agriculture lies in the better management of water and *in situ* conservation of moisture.

The availability and demand of water vary with time and space. One of the major requirements for water resources development and management is analysis of water availability and demand in the area. The spatial variation necessitates, selecting a suitable hydrological unit in terms of area in which water availability is uniform. Watershed is a hydrological unit since it has defined boundaries and can be taken as unit for water balance studies (Giraldez and Ayuso, 1988). Also, watershed based water management is being advocated as most appropriate approach, since in this approach, emphasis is being given to meet the total water demand in the watershed from available resources. This approach sounds well and scientific, as it offers a possibility of matching the demand

with the availability on temporal scale. Keeping the above necessities in view, a project was undertaken for computation of water needs in the Dr. PDKV campus and available water potential.

### METHODOLOGY

#### Location and climate of watershed:

The watershed that is under study was delineated on contour map (Scale 1:5000 cm). Akola is located between 19°51' and 21°16' N latitude and 56°33' and 77°44' E longitude. Watershed area is about 265 ha. Nala is flowing in the direction from North to Southwest.

The mean monthly temperature of Akola ranges from 20.5 to 30.5°C with recorded minimum and maximum temperature of 11.8°C and 48.5°C in the month of December and May, respectively. Akola district falls in assured rainfall zone of Maharashtra state having an average annual rainfall (a.a.r.) of 790 mm. Rainfall occurs mainly during South West monsoon originating from Arabian Sea. Onset of monsoon is normally during the second week of June and gradually reduces in month of October. About 90% annual rainfall occurs between June to September.

#### Analysis of daily rainfall data:

The daily rainfall data were collected from the meteorological department of Dr.Panjabrao Deshmukh Krishi Vidyapeeth, Akola. To estimate the runoff, the eleven years (1992-2002) daily rainfall data were considered for the study. The collected daily rainfall data were analysed for deciding the antecedent moisture