

**Short communication**

**Rainfall and PET variation at selected stations of Telangana region of Andhra Pradesh**

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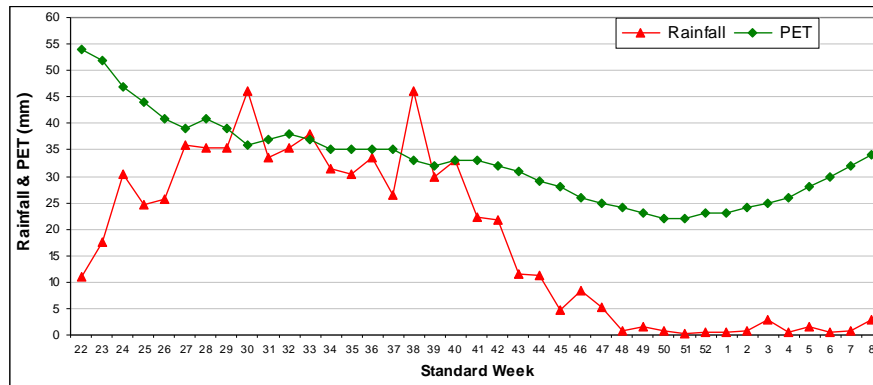
Water is the prime source for all the living things, including plants. The availability of water in any region depends upon the amount and distribution of annual rainfall in that region. The purpose of irrigation is to supplement rainfall to meet crop water needs. However, it is not possible to determine to what extent rainfall fails to supply the needs of plants for water without knowing their water requirements.

The variability of rainfall in Andhra Pradesh is very high due to erratic behaviour of South West monsoon (*kharif* season) and North East monsoon (*rabi* season). Due to over exploitation of ground water for cultivation of paddy the water table has gone down drastically in recent years. Thus it has become necessary to work out the water balance of different locations in the state. The water balance of a place helps us to know the length of crop growing period to advocate suitable cropping system, contingent crop planning and to explore possibility of crop diversification. This can be done by identifying the periods of sufficient rainfall and drought during critical growth periods of the crops. In view of this, the present study was undertaken to assess

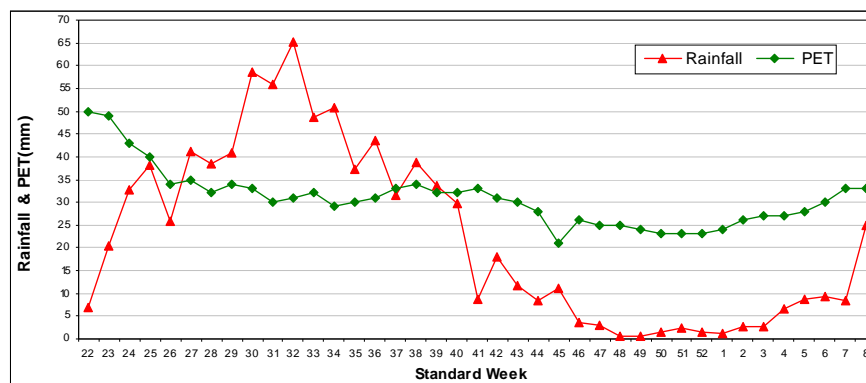
the climatic water balance of different locations representing two agroclimatic zones in Andhra Pradesh.

Data on weather parameters – temperature, rainfall, wind speed, relative humidity, sunshine hours were collected for two locations in Andhra Pradesh *i.e.*, Rajendranagar (1965-2005) in South Telangana region and Rudrur (1963-2003) in North Telangana region. Potential evapotranspiration (PET) for these centres was computed using the Modified Penman approach (Doorenbos & Pruitt, 1977). Climate of the region was categorized on monthly, seasonal and annual basis using moisture index (MI) following Krishnan and Singh (1972).

S.No	Moisture index value	Climatic group
1.	< - 80	Extremely dry
2.	- 80 to - 60	Semi - dry
3.	- 60 to - 40	Dry
4.	- 40 to - 20	Slightly dry
5.	- 20 to 0	Slightly moist
6.	0 to 50	Moist
7.	50 to 100	Wet
8.	>100	Extremely wet



**Fig.1:** Rainfall and PET at Rajendranagar of South Telangana region of Andhra Pradesh



**Fig.2:** Weekly rainfall and PET at Rudrur of North Telangana region of Andhra Pradesh

Results revealed that at Rajendranagar, the annual potential evapo transpiration (PET) was 1870 mm with annual rainfall of 768.5 mm and thus leaving a water deficit of 1101.5 mm (Table 1). On seasonal basis, the estimated PET was 710 mm during *Kharif* and 573 mm during *rabi* season with corresponding rainfall of 566.9 mm and 132 mm, respectively. During

monsoon season (June to September) the rainfall is lower than PET, except during the last week of July (i.e., standard week No.30) and third week of September (i.e., standard week No.38) where the rainfall exceeds PET (Fig.1) while during remaining parts of the year PET exceeds rainfall.

At Rudrur, an estimated PET demand

**Table 1:** Monthly, seasonal and annual rainfall (mm), PET (mm), Moisture index (MI) and climatic group for selected centres in Telangana region

Months / Seasonal / Annual period	Rajendranagar						Rudrur				
	RF	PET	Balance	MI	Climatic group		RF	PET	Balance	MI	Climatic group
January	4.5	98.0	-93.5	-95	Extremely dry		13.4	104.0	-90.6	-87	Extremely dry
February	5.6	124.0	-118.4	-96	Extremely dry		51.0	124.0	-73	-59	Dry
March	13.8	153.0	-139.2	-91	Extremely dry		7.1	157.0	-149.9	-95	Extremely dry
April	25.6	228.0	-202.4	-89	Extremely dry		10.4	229.0	-218.6	-95	Extremely dry
May	30.2	206.0	-175.8	-85	Extremely dry		13.8	201.0	-187.2	-93	Extremely dry
June	83.7	197.0	-113.3	-58	Dry		98.0	182.0	-84	-46	Dry
July	178.5	196.0	-17.5	-9	Slightly moist		205.1	168.0	37.1	22	Moist
August	138.3	147.0	-8.7	-6	Slightly moist		220.4	122.0	98.4	81	Wet
September	166.4	170.0	-3.6	-2	Slightly moist		184.9	160.0	24.9	16	Moist
October	88.6	129.0	-40.4	-31	Slightly dry		68.1	126.0	-57.9	-46	Dry
November	29.4	108.0	-78.6	-73	Semi dry		6.8	118.0	-111.2	-94	Extremely dry
December	3.9	114.0	-110.1	-97	Extremely dry		18.4	97.0	-78.6	-81	Extremely dry
<i>Kharif</i> (June Sept.)	566.9	710.0	-143.1	-20.2	Slightly dry		708.4	632.0	76.4	12.1	Dry
<i>Rabi</i> (Oct Feb)	131.9	573.0	-441.1	-77.0	Semi dry		165.4	572.0	-406.6	-71.1	Moist
Annual	768.5	1870.0	-1101.5	-58.9	Dry		905.0	1791.0	-886.0	-49.5	Semi dry

was 1791 mm with a rainfall of 905 mm thus leaving a water deficit of 886 mm annually (Table 1). The seasonal analysis indicated that, the estimated PET was 632 mm and 572 mm during *kharif* and *rabi* seasons, respectively, with corresponding rainfall of 708 and 165 mm. This leaves a surplus of 76 mm in *kharif* and a water deficit of 407 mm during *rabi* season. During July, August and September rainfall exceeds PET, whereas in the remaining period PET exceeds rainfall (Fig. 2). The rainfall exceeds PET for nearly 12 weeks during *kharif* season.

#### ***Moisture index***

Based on monthly moisture index values at Rajendranagar, six months can be termed as extremely dry and three months can be termed as slightly moist (Table 1). Similarly at Rudrur, six months can be termed as extremely dry, three months as dry, two months as moist and one month as wet. The annual and seasonal data on climatic groups indicated that the *rabi* season is semi dry at Rajendranagar and Rudrur. *Kharif* season is slightly dry at Rajendranagar and moist at Rudrur (Table 1).

Overall, the analysis indicated that, annual as well seasonal water deficit is the highest at Rajendranagar (South Telangana region) compared to Rudrur (North Telangana region). Such analysis is very helpful in working out the length of crop growing period, advocacy of suitable cropping system, contingent crop planning and diversification of crops for judicious use of limiting water resources. From this study, it can be concluded that the success rate of the rainfed crops and yield levels are relatively high in North Telangana zone as compared to South Telangana zone, for the locations studied.

#### **REFERENCES**

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