

Figure 6.22. Extreme persisting 24-hour point dewpoint temperatures over India (Rakhecha and Kennedy, 1985)

Figure 6.24 and are applicable to flat land at sea level next to the coast. The final values shown include regional durational and areal smoothing. Values for individual basins can be obtained by use of these curves and the adjustments discussed in the preceding paragraph.

6.2.4 Estimating PMP for Chambal, Betwa, Sone and Mahi watersheds in India

6.2.4.1 Introduction

Chambal, Betwa, Sone and Mahi watersheds are all located in the central west of India. There are no mountain chains in any of the watersheds. PMP estimation for the four watersheds is presented in *Dam Safety Assurance and Rehabilitation Project Generalized PMP Atlas, Phase 1* (Water and Power Consultancy Services (India) Limited, 2001). The statistical estimation method was used for small watersheds, the generalized DAD method for medium to large watersheds, and the method of precipitation depth–duration analysis for large watersheds.

6.2.4.2 Estimating PMP for small watersheds

Hershfield's (1961a, 1961b, 1965) statistical estimation method was used to estimate PMP for small watersheds. This method is also commonly used to check results of PMP for small to intermediate watersheds determined rough hydrometeorological methods. It was used to estimate the annual 1- and

2-day maximum PMP for Chambal, Betwa, Sone and Mahi watersheds.

To estimate PMP for 1-day duration, the frequency factors for rainfalls with 1-day duration at all the rainfall stations were calculated and drawn on the watershed map. Table 6.1 lists the frequency factors K_m for rainfalls with 1-day duration in the four watersheds. The enveloping values of K_m were determined from the mean annual maximum rainfall series. The frequency factor did not show a regional distribution, but decreased as rainfall increased, hence the enveloping curves of increasing K_m for decreasing were drawn for the four watersheds. PMP was determined from the K_m for each rainfall stations. The daily rainfalls used to determine PMP were observation-day (8.30 a.m. to 8.30 a.m.) rainfalls, so it was recommended that the correction coefficient 1.13 provided by WMO should be used for determining PMP. Table 6.2 lists PMP for 1-day duration for two of the watersheds.

The method of estimating PMP for 2-day duration was identical to that used for PMP for 1-day duration, but it was the annual 2-day maximum rainfall series that was selected, for which the 2 days must be 48 continuous hours. Table 6.1 lists the frequency factors for rainfalls with 2-day durations in Chambal, Betwa, Sone and Mahi watersheds, and Table 6.2 lists PMP for 2-day duration for Chambal and Betwa watersheds calculated through the statistical method.

6.2.4.3 Estimating PMP for medium to large watersheds

The generalized DAD method was used to estimate PMP for medium to large watersheds, with specific

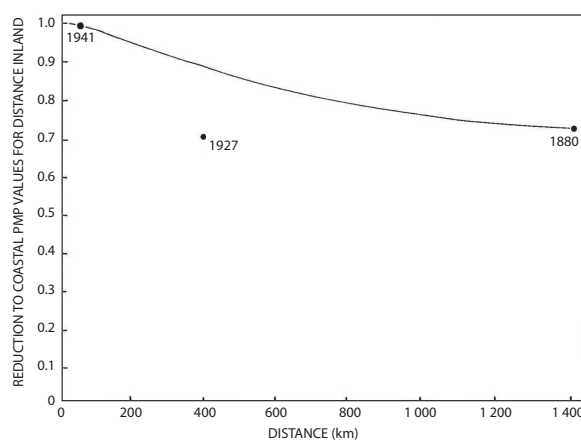


Figure 6.23. Adjustment factor for distance from coast for non-orographic PMP values in India (Rakhecha and Kennedy, 1985)