ANNEXURE II

BLANEY-CRIDDLE METHOD

This method is suggested for areas where available climatical data covers air temperature data only.

The original Blaney-Criddle equation (1950) involves the calculation of the consumptive use factor (f) from mean temperature (T) and percentage (p) of total annual day light hours occurring during the period being considered. An empirically determined consumptive use crop ccefficient (K) is then applied to establish the consumptive water requirements (CU) or $CU = K.f = K(p.T/100)$ with T in °F. CU is defined as the amount of water potentially required to meet the evapotranspiration needs of vegetative areas so that plant production is not limited by lack of water'. The effect of climate on crop water requirements is, however, insufficiently defined by temperature and day length; crop water requirements will vary widely between climates having similar values of T and p. consequently the consumptive use crop coefficient (K) will need to vary not only with the crop but also very much with climatic conditions.

For a better definition of the effect of climate on crop water requirements, but still employing the Blaney-Criddle, temperature and day length related factor 'f' a method is presented to calculate reference crop evapotranspiration (ET_o). Using measured temperature data as well as general levels of humidity, sunshine and wind, an improved prediction of the

effect of climate on evapotranspiration can be obtained.

The relationship recommended, representing mean value over the given month, is expressed as :

$$ET_o = C \left[p(0.46\ T + 8)\right] \text{ mm/day}$$

where : ET_o = reference crop evapotranspiration in mm/day for the month considered.

T = mean daily temperature in °C over the month considered.

p = Mean daily percentage of total annual day time hours obtained from Table for a given month and latitude.

C = adjustment factor which depends on minimum relative humidity, sunshine hours and day time wind estimates.

After determining ETo, ET crop can be predicted by using the appropriate crop co-efficient (Kc).

$$ET \text{ crop} = Kc.ET_o.$$

ANNEXURE II.A

Potential Evapotranspiration (PET)(Blaney-Criddle's Approach)

Month	Monthly Consumptive use factor (f)+	Potential Evapotranspiration							
		Cotton		Banana		Maize & Cereals		Forest	
		K_c*	E_p	K_c*	E_p	K_c*	E_p	K_c*	E_p
Jan	13.17	0.50	6.58	0.40	5.26	-	-	0.50	6.58
Feb	13.18	0.50	6.59	0.40	5.27	-	-	0.50	6.59
Mar	16.92	-	-	0.45	7.61	-	-	0.50	8.46
Apr	18.82	-	-	0.50	9.41	-	-	0.50	9.41
May	21.32	-	-	0.60	12.79	-	-	0.50	10.66
Jun	20.36	0.50	10.18	0.70	14.25	0.60	12.21	0.50	10.18
Jul	19.60	0.60	11.76	0.85	16.66	0.70	13.72	0.50	9.80
Aug	18.64	0.75	13.98	1.00	18.64	0.80	14.91	0.50	9.32
Sep	17.21	0.90	15.48	1.10	18.93	0.80	13.76	0.50	8.60
Oct	16.44	0.85	13.97	1.10	18.08	0.60	09.86	0.50	8.22
Nov	13.96	0.75	10.47	0.90	12.56	-	-	0.50	6.98
Dec	13.21	0.55	7.26	0.80	10.56	-	-	0.50	6.61

*K_c = Crop Factor

+ f = from Annexure

ANNEXURE II.B

Actual Evapotranspiration (AET),(Blaney Criddle's Approach)

Basin	Upper Heran			Middle Heran				Lower Heran		Entire Heran			
Crops	Cotton	Maize Cereal	Forest	Cotton	Banana	Cereal Maize	Forest	Cotton	Cereal Maize	Cotton	Cereal Maize	Banana	Forest
Percentile area	4%	25%	20%	15%	4%	35%	8%	30%	44%	11.75%	31.04%	0.76%	13.4%
Jan	0.26	-	1.32	0.99	0.21	-	0.52	1.98	-	0.77	-	0.04	0.88
Feb	0.26	-	1.32	0.99	0.21	-	0.53	1.98	-	0.77	-	0.04	0.88
Mar	-	-	1.69	-	0.30	-	0.67	-	-	-	-	0.06	1.13
Apr	-	-	1.88	-	0.37	-	0.75	-	-	-	-	0.71	1.26
May	-	-	2.13	-	0.51	-	0.85	-	-	-	-	0.10	1.43
Jun	0.41	3.05	2.03	1.53	0.57	4.27	0.81	3.05	5.37	1.19	3.79	0.11	1.36
Jul	0.47	3.43	1.96	1.76	0.66	4.80	0.78	3.53	6.03	1.38	4.26	0.12	1.31
Aug	0.56	3.73	1.86	2.10	0.74	5.22	0.74	4.20	6.56	1.64	4.63	0.14	1.25
Sep	0.62	3.44	1.72	2.32	0.75	4.81	0.69	4.64	6.05	1.82	4.27	0.14	1.15
Oct	0.56	2.46	1.64	2.09	0.72	3.45	0.65	4.19	4.34	1.64	3.06	0.14	1.10
Nov	0.42	-	1.40	1.57	0.50	-	0.56	3.14	-	1.23	-	0.09	0.93
Dec	0.29	-	1.32	1.10	0.42	-	0.53	2.20	-	0.85	-	0.08	0.88
TOTAL	3.85	16.11	20.27	14.45	5.96	22.55	8.08	28.91	28.35	11.29	20.01	1.14	13.58
	= 40.23 cm				= 51.04 cm			= 57.26 cm			= 46.02 cm		