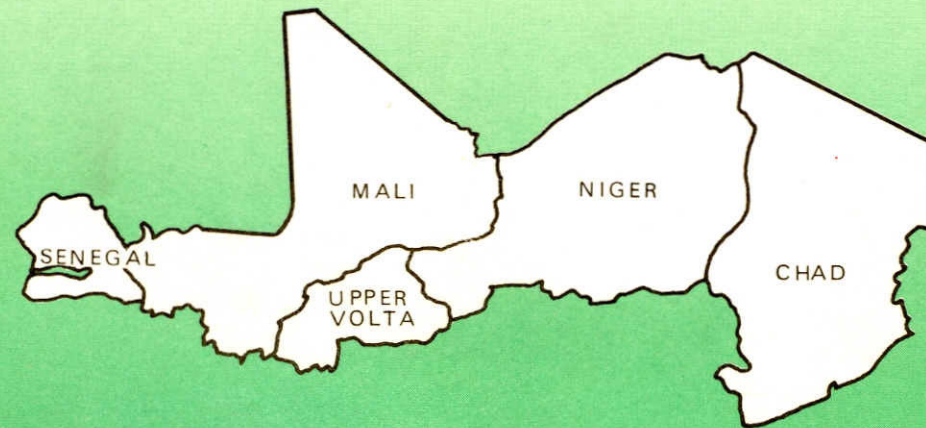


# A Handbook on the Rainfall Climatology of West Africa : Data for Selected Locations

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## **PREFACE**

In the pursuit of our efforts to understand the agricultural climate of the West Africa region, we have assembled rainfall and evapotranspiration data for five West African countries: Senegal, Mali, Upper Volta, Niger, and Chad. The objective of this publication is to inform scientists, agricultural research workers, planning agencies, and agricultural extension workers about the climatic characteristics of this region. The data presented here should facilitate calculations regarding moisture adequacies at different locations.

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## Rainfall Climatology of West Africa

In the attempts for rational development of agriculture in the arid and semi-arid regions of the world, knowledge regarding suitable means for rapidly evaluating climate and moisture adequacies is important and crucial. Effective estimation of the climatic water balance over large areas depends to a large extent on the available supply and the ability to estimate potential demand.

Mean monthly rainfall provides a general idea about the available supply. Hargreaves (1977) indicated that 75% probability of rainfall occurrence is a much more reliable indication of moisture available for crop production than mean precipitation. With this idea, we are listing the dependable precipitation (DP) amounts for all the locations. Dependable precipitation is defined as the precipitation that has a specified probability of occurrence (in this case at least 3 to 4 years) based on an analysis of longtime precipitation records.

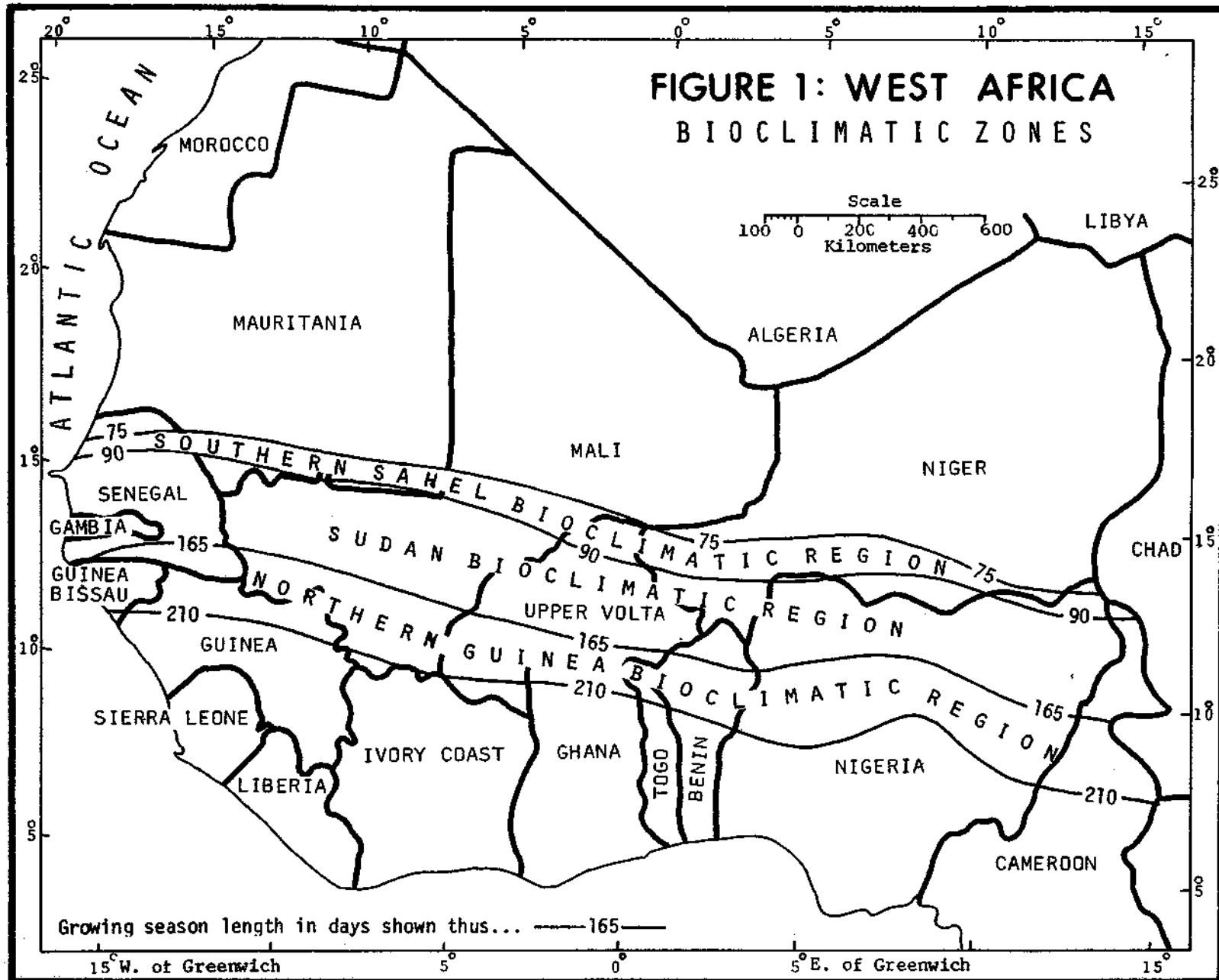
Potential evapotranspiration (PE) gives an idea regarding the potential demand for water at a given location. It is defined as the amount of water transpired from an actively growing, short green plant cover (usually grass) with a full crop cover and a continuously adequate moisture supply. PE values were estimated for all the locations according to procedure described by Reddy and Virmani (1980). These are

essentially an extension of the PE estimates of the region based on Penman's approach (Cocheme and Franquin, 1967).

The survey covers five countries of the region: Senegal, Mali, Upper Volta, Niger and Chad. The region is located between 7° and 15° North latitude and 17° West and 24° East longitude. The total area covered is about 42 million km<sup>2</sup>. The density of raingauge stations is generally higher in the relatively higher rainfall areas in all the countries.

The greater part of the African continent is in the intertropical zone, where agricultural activities are primarily dictated by the season. In the arid environments of the Sahelian deserts, only isolated spots with water supply offer even limited scope for agricultural activities; the tropical forest zones, south of 10° latitude, are rainy for more than 7 months annually, but the region is covered with dense forests, the soils are improverished, and human inhabitation is extremely difficult.

It is the semi-arid, seasonally dry West African region that offers the maximum scope for crop development. The area (Fig. 1) has three major bioclimates: southern Sahelian bioclimate, having a growing period from 75 to 90 days; Sudan bioclimate, with a growing period from 70 to 165 days; and the northern Guinea bioclimate, with a growing period from 165 to 210 days. ICRISAT's major interest lies in the southern Sahelian and Sudanese types of bioclimate where the growing season extends from about 2.5 months to about 5 months.



(Adapted from CIEH, 1979)

The data listed for different locations can be used to assess the moisture adequacy. Precipitation amounts can be related in a very-general way to crop production by evaluating the ratio between dependable precipitation and potential evapotranspiration. The ratio (DP/PE) has been defined as moisture availability index (MAI) by Hargreaves (1974). It is to be remembered that moisture adequacy at a given location depends also on the soil conditions. In the absence of adequate information on the soil type, its depth and water storage capacity, etc., MAI can provide an approximation of water availability.

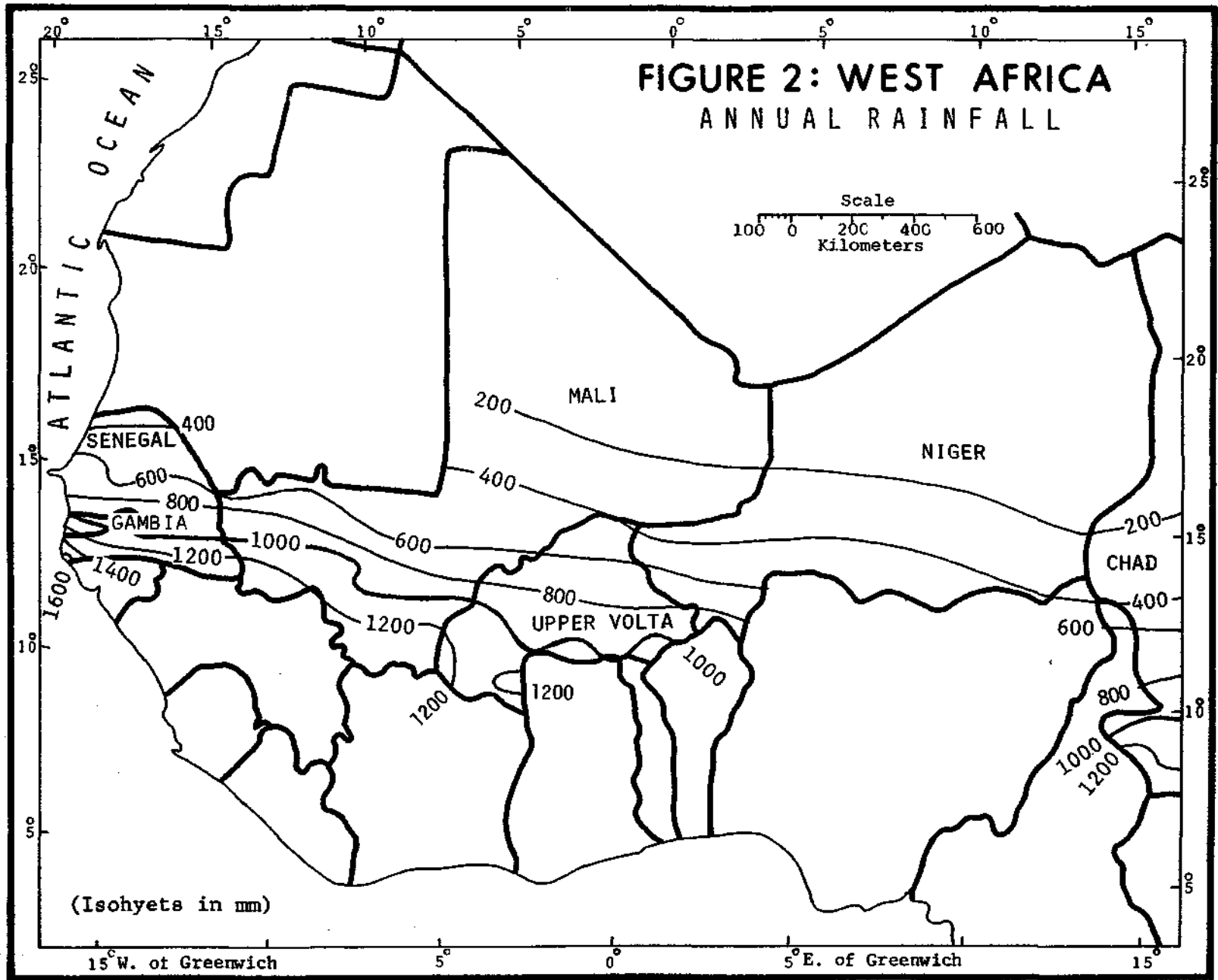
Hargreaves (1974) proposed that MAI be adopted as a standard index for measuring water deficiencies and excess and that the following classification be used.

MAI	=	0.00 to 0.33	very deficient
MAI	=	0.34 to 0.67	moderately deficient
MAI	=	0.68 to 1.00	somewhat deficient
MAI	=	1.01 to 1.33	adequate
MAI	=	1.34 and above	excessive

The reader can also use these data to evaluate various other indices proposed by Thornthwaite (1948) , Thornthwaite and Mather (1955) , Cocheme and Franquin (1967) , and Troll (1965) .

Using the mean annual rainfall and mean annual potential evapotranspiration data for all locations, maps have been prepared for the West

**FIGURE 2: WEST AFRICA**  
ANNUAL RAINFALL



(Isohyets in mm)

15° W. of Greenwich

5°

0°

5° E. of Greenwich

15°

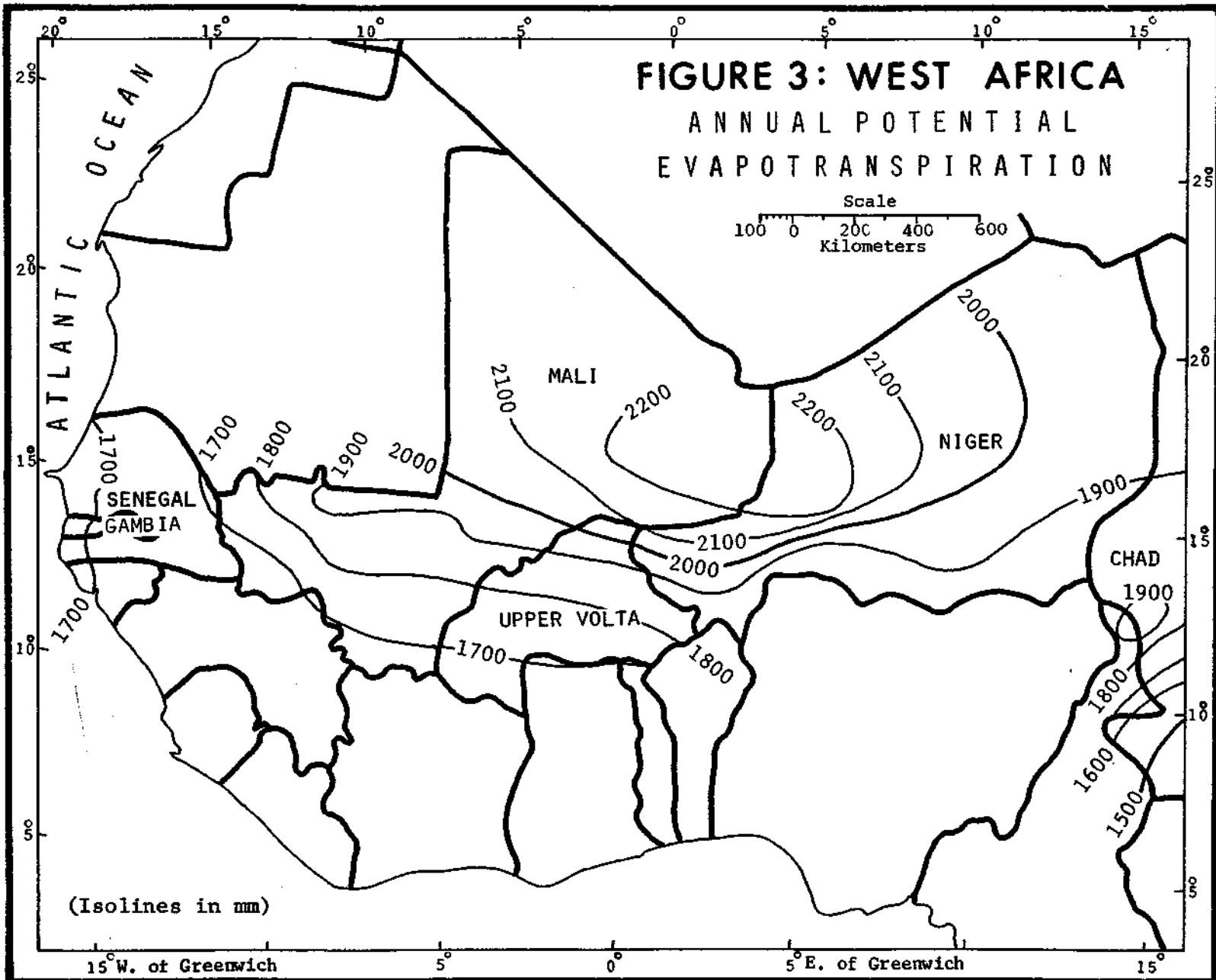


African area including Senegal, Gambia, Mali, Upper Volta, Niger, and Chad. As depicted in Figure 2, the average annual rainfall decreases from 1200 mm to 200 mm as one moves away from the equator to the 20th parallel. The isohyets are much closer in the western region than in the central and eastern regions. This may be due to the greater amplitude of movement and therefore swifter passage of the intertropical convergence zone (ITCZ) in the east than in the west, and to habitual large-scale convergence.

Mean annual potential evapotranspiration over West Africa (Fig. 3) follows the general pattern of the distribution of rainfall. The values of potential evapotranspiration are low in the higher rainfall areas and increase as we move towards the Sahel. The exception is observed in the areas around the Atlantic Ocean where, due to the pressure of a large body of water, the PE values are uniform on land, particularly over Senegal.

It is hoped that the reader will be able to assess the potentiality for dryland agriculture in given regions by using the data presented herein.

**FIGURE 3: WEST AFRICA**  
ANNUAL POTENTIAL  
EVAPOTRANSPIRATION



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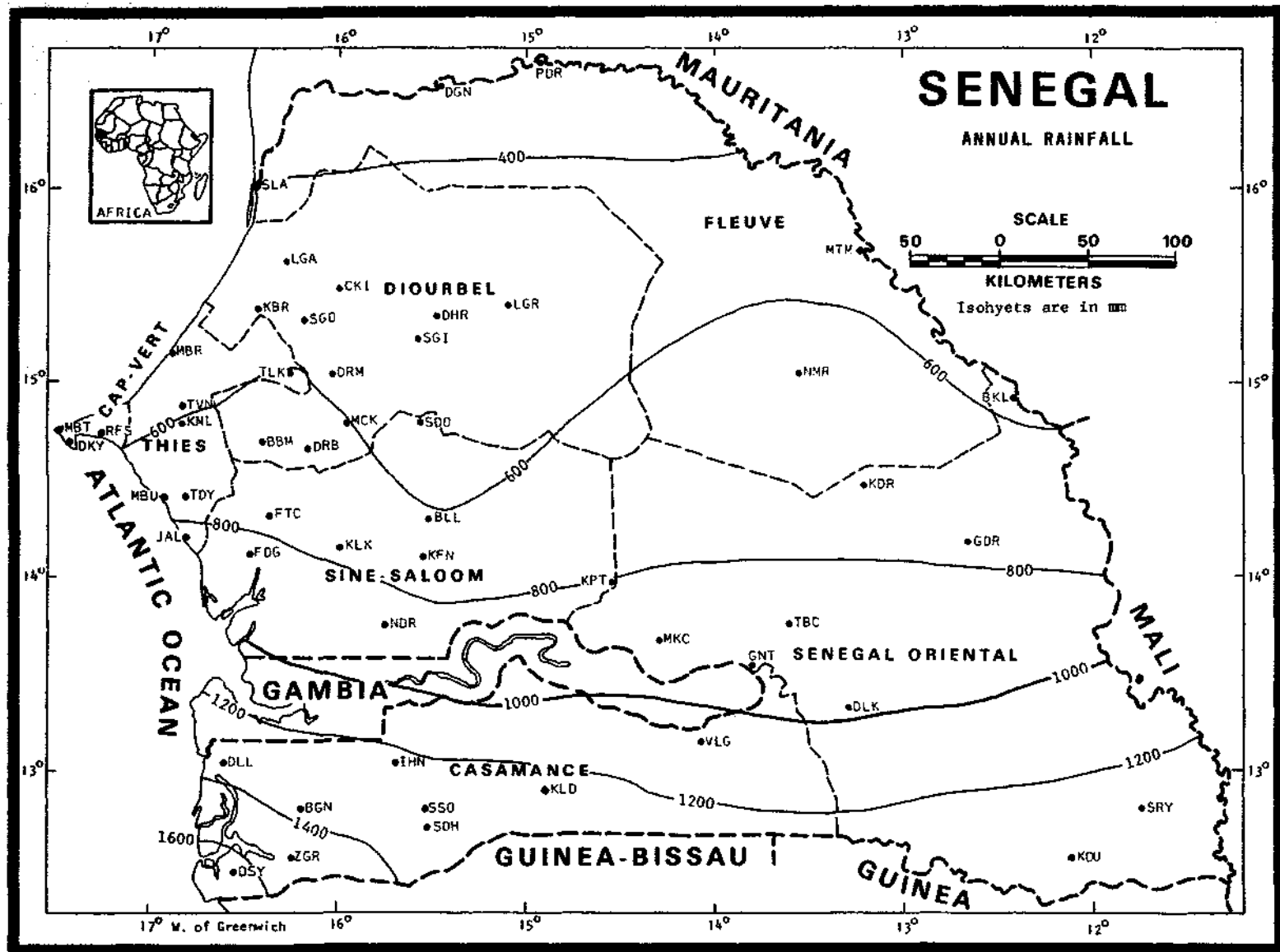
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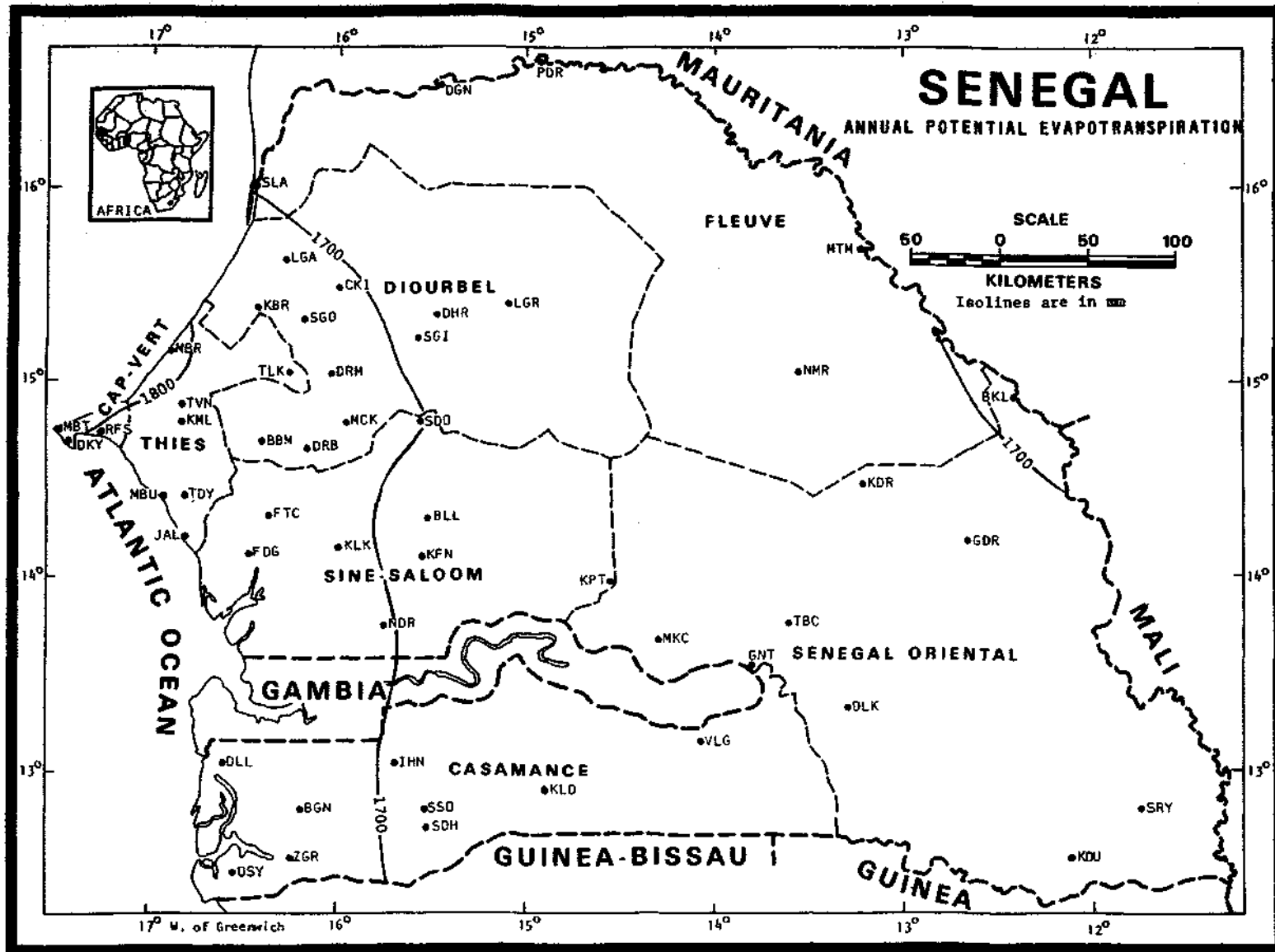
**Data for Selected Locations**



lean monthly rainfall (P), dependable precipitation (DP) and potential evapotranspiration (PE) at selected locations in West Africa

Location	Latitude O'	Longitude O'	Elevation (m)		P, DP and PE (mm)													
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
<b>SENEGAL</b>																		
1. Bakel BKL	14 54	12 28	-	P	1	0	0	0	6	48	120	178	121	29	3	1	509	
				DP	0	0	0	0	1	27	81	125	75	8	0	0		
				PE	113	125	170	186	200	177	146	118	125	133	114	107	1714	
2. Bambey Meteo BBM	14 42	16 28	20	P	0	1	0	0	3	30	125	246	187	55	2	1	651	
				DP	0	0	0	0	0	9	77	153	125	18	0	0		
				PE	136	133	164	173	165	161	138	130	135	144	130	130	1739	
3. Bignona BGN	12 40	16 16	18	P	0	0	0	0	5	117	317	459	314	127	8		1346	
				DP	0	0	0	0	1	74	238	319	224	68	0	0		
				PE	133	134	160	174	177	161	131	125	128	140	125	123	1711	
4. Boulel BLL	14 17	15 32	35	P	0	0	0	0	2	55	143	190	156	63	0	0	609	
				DP	0	0	0	0	0	30	75	144	102	19	0	0		
				PE	129	133	170	174	175	156	130	120	125	138	121	122	1693	
5. Coki CKI	15 31	16 00	43	P	0	2	0	0	3	22	92	183	142	47	2	3	496	
				DP	0	0	0	0	1	4	57	120	94	12	0	0		
				PE	131	131	170	165	160	151	142	126	136	143	125	125	1705	
5. Dagana DGN	16 31	15 30	5	P	0	2	0	0	3	14	52	123	86	26	2	2	309	
				DP	0	0	0	0	0	3	20	75	47	4	0	0		
				PE	129	124	165	160	150	142	148	136	138	143	124	126	1685	
7. Dahra DHR	15 20	15 29	39	P	0	2	0	0	6	30	104	173	131	45	2	0	496	
				DP	0	0	0	0	0	6	53	106	94	12	0	0		
				PE	128	128	172	170	163	142	140	130	135	140	120	124	1692	
3. Dakar-Yoff DKY	14 44	17 30	27	P	0	1	0	0	0	10	87	220	164	58	2	3	<b>546</b>	
				DP	0	0	0	0	0	4	31	123	102	10	0	0		
				PE	142	134	160	173	165	165	159	141	143	149	149	151	1831	
9. Daroumousty DRM	15 02	16 02	49	P	0	2	0	0	4	26	110	198	133	36	2	0	512	
				DP	0	0	0	0	0	8	64	120	73	10	0	0		
				PE	132	131	167	172	165	155	137	128	134	142	125	126	1714	
10. Dialakoto DLK	13 19	13 18	50	P	1	0	0	1	31	141	202	289	222	63	4	0	956	
				DP	0	0	0	0	5	93	139	204	142	16	0	0		
				PE	126	134	174	178	192	147	114	100	100	120	116	117	1618	

Table continued





Location	Latitude O'	Longitude O'	Elevation (m)		P, DP and PE (mm)												Annual
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
11. Diouloulou DLL	13 02	16 35	12	P	0	0	0	0	4	74	312	553	318	117	9	0	1388
				DP	0	0	0	0	1	36	219	361	208	63	0	0	
				PE	133	134	159	174	177	161	132	126	129	141	125	124	
12. Diourbel DRB	14 39	16 14	7	P	1	0	0	0	5	42	131	243	179	54	3	2	661
				DP	0	0	0	0	0	17	82	159	121	14	0	0	
				PE	134	133	165	173	165	159	135	128	133	143	127	127	
13. Fatick FTC	14 20	16 24	6	P	0	0	0	0	2	47	155	287	214	66	2	3	777
				DP	0	0	0	0	0	20	96	204	135	23	0	0	
				PE	135	134	162	174	170	161	135	128	132	143	129	128	
14. Foundi- ougne FDG	14 07	16 28	6	P	0	0	0	0	3	44	160	360	224	68	1	2	863
				DP	0	0	0	0	0	18	96	248	155	29	0	0	
				PE	135	134	160	174	171	162	135	128	132	144	129	128	
15. Goudiry GDR	14 11	12 43	59	P	0	0	0	1	12	89	185	260	170	51	4	0	773
				DP	0	0	0	0	3	63	136	201	119	16	0	0	
				PE	121	132	174	183	194	160	128	111	113	125	115	110	
16. Gueneto GNT	13 33	13 49	20	P	0	0	0	0	18	126	209	261	244	72	6	0	939
				DP	0	0	0	0	4	84	152	178	169	27	0	0	
				PE	125	133	172	176	190	147	115	100	110	120	111	117	
17. Inhor IHN	13 01	15 42	15	P	0	0	0	0	6	110	256	453	246	125	7	0	1205
				DP	0	0	0	0	1	53	186	310	166	48	0	0	
				PE	131	134	164	174	180	160	129	120	125	138	123	121	
18. Joal JAL	14 10	16 51	3	P	0	0	0	0	1	29	155	328	237	85	1	2	840
				DP	0	0	0	0	0	11	70	219	151	25	0	0	
				PE	138	134	159	174	168	164	138	134	137	146	140	143	
19. Kaffrine KFN	10 06	15 33	11	P	0	1	0	0	5	60	147	266	183	60	3	1	727
				DP	0	0	0	0	0	33	115	184	136	28	0	0	
				PE	129	134	169	174	175	156	130	119	125	138	121	121	
20. Kaolack KLK	14 08	16 04	6	P	0	0	0	0	5	63	157	295	208	62	4	2	798
				DP	0	0	0	0	0	27	97	209	139	26	0	0	
				PE	132	132	164	174	173	160	133	125	129	141	124	124	

Table continued

Senegal																	
Location	Latitude O'	Longitude O'	Elevation (m)		P, DP and PE (mm)												
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
21. Kebemer KBR	15 22	16 27	40	P	0	2	0	0	5	18	72	169	124	37	1	2	429
				DP	0	0	0	0	4	33	107	74	8	0	0		
				PE	137	131	166	163	156	158	150	135	139	145	132	133	1745
22. Kedougou KDU	12 34	12 13	178	P	0	0	0	5	48	185	261	331	320	136	16	0	1303
				DP	0	0	0	1	18	144	210	262	251	73	0	0	
				PE	130	134	174	179	181	145	117	100	105	128	119	115	1627
23. Khombole KML	14 46	16 42	18	P	0	3	0	0	2	16	109	256	181	69	0	2	640
				DP	0	0	0	0	5	72	178	116	17	0	0		
				PE	140	134	161	173	164	164	140	135	140	146	140	143	1780
24. Kidira KDR	14 28	12 13	35	P	1	0	0	1	10	88	169	253	170	55	4	0	752
				DP	0	0	0	0	2	49	114	178	94	12	0	0	
				PE	126	134	175	185	200	165	134	114	117	130	118	117	1715
25. Kolda KLD	12 53	14 58	35	P	0	0	0	0	15	136	251	386	299	129	8	0	1224
				DP	0	0	0	0	3	96	186	298	235	73	0	0	
				PE	129	134	171	175	184	156	125	115	121	135	119	117	1681
26. Koumpen- toum KPT	13 59	14 33	18	P	0	1	0	2	15	85	154	255	204	86	5	0	808
				DP	0	0	0	0	2	47	113	181	130	28	0	0	
				PE	126	133	173	175	184	149	126	112	120	130	116	116	1660
27. Linguere LGR	15 23	15 07	20	P	0	1	1	0	3	28	97	185	127	47	2	2	494
				DP	0	0	0	0	0	8	64	121	88	11	0	0	
				PE	126	126	171	173	165	141	140	128	133	138	118	121	1680
28. Louga LGA	15 37	16 13	38	P	1	1	0	0	2	15	85	169	131	38	2	2	447
				DP	0	0	0	0	0	4	40	100	84	10	0	0	
				PE	134	130	168	163	156	152	144	133	138	144	129	126	1717
29. Maka-Couli- bentan MKC	13 40	14 18	18	P	0	0	0	1	15	106	197	256	218	83	6	0	882
				DP	0	0	0	0	2	64	137	178	162	32	0	0	
				PE	127	133	173	176	188	149	120	110	116	128	116	115	1651
30. Matam MTM	15 38	13 15	15	P	0	1	0	0	3	44	120	187	113	26	2	2	498
				DP	0	0	0	0	0	16	75	124	71	4	0	0	
				PE	96	105	140	183	178	185	155	130	137	135	105	91	1640

Table continued

Location	Latitude O'	Longitude O'	Elevation (m)		P, DP and PE (mm)												Annual
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
31. M Backe MCK	14 48	15 55	41	P	0	1	0	0	4	34	120	227	164	50	3	0	604
				DP	0	0	0	0	12	70	141	106	15	0	0		
				PE	130	131	168	173	165	155	135	127	132	141	124	124	
32. M Bao- Thiaroye MBT	14 46	17 29	4	P	0	2	0	0	0	16	84	231	165	43	2	4	547
				DP	0	0	0	* 0	4	36	139	110	8	0	0		
				PE	142	134	160	173	165	165	159	141	143	149	149	151	
33. M Boro MBR	15 08	16 53	7	P	0	0	0	0	0	11	76	194	117	46	0	1	447
				DP	0	0	0	0	3	33	129	73	7	0	0		
				PE	141	133	162	170	161	165	160	141	142	148	145	150	
34. M Bour MBU	14 25	16 58	10	P	0	0	0	0	2	25	126	301	222	58	4	5	742
				DP	0	0	0	0	9	63	184	131	18	0	0		
				PE	141	134	160	173	165	165	140	138	141	147	140	150	
35. Namary NMR	15 02	13 34	42	P	0	0	0	0	5	76	158	261	204	47	4	3	758
				DP	0	0	0	0	1	20	122	191	123	9	0	0	
				PE	105	117	153	179	180	165	143	120	128	132	110	100	
36. Nioro du Rip NDR	13 44	15 47	18	P	0	0	0	0	5	76	183	332	210	67	1	1	876
				DP	0	0	0	0	40	134	230	160	29	0	0		
				PE	131	133	166	174	175	159	131	121	127	139	123	122	
37. Oussouye OSY	12 29	16 32	15	P	0	0	0	0	6	118	430	549	368	158	11	0	1641
				DP	0	0	0	0	2	68	304	418	283	87	0	0	
				PE	133	134	150	174	177	161	131	125	128	140	125	124	
38. Podor PDR	16 38	14 56	6	P	0	2	0	0	2	14	57	117	81	23	2	1	301
				DP	0	0	0	0	4	24	65	36	3	0	0		
				PE	124	121	158	166	160	152	151	136	138	141	118	122	
39. Rufisque RFS	14 44	17 18	4	P	0	2	0	0	0	15	93	238	173	47	2	0	572
				DP	0	0	0	0	3	42	120	111	6	0	0		
				PE	134	133	165	173	165	159	135	128	133	143	127	127	
40. Sadio SDO	14 48	15 33	22	P	0	3	0	0	6	27	109	184	167	70	0	0	567
				DP	0	0	0	0	0	5	57	125	99	19	0	0	
				PE	128	131	171	173	170	150	143	124	129	139	121	122	

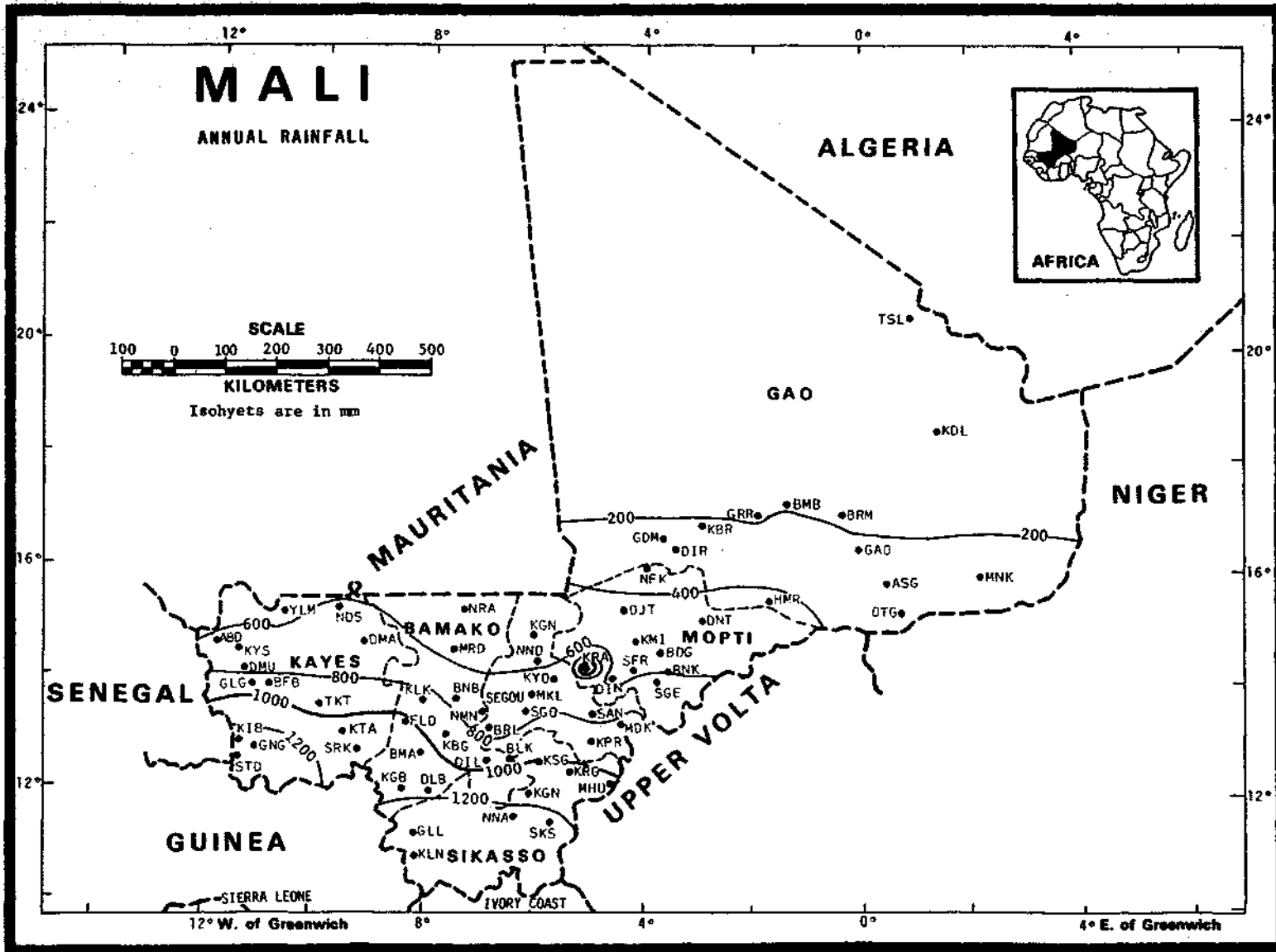
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Location	Latitude O'	Longitude o i	Elevation (m)		P, DP and PE (mm)												
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
41. Sagata- Linguere SLA	15 13	15 34	-	P	0	2	0	0	6	32	115	215	166	54	3	3	596
				DP	0	0	0	0	1	10	79	129	129	12	0	0	
				PE	128	130	172	173	165	145	137	127	132	141	120	123	1693
42. Sagata- Louga SGO	15 17	16 11	41	P	0	2	0	2	9	24	107	186	160	42	3	2	538
				DP	0	0	0	0	1	6	68	131	98	13	0	0	
				PE	132	131	167	172	165	155	137	128	134	142	125	126	1714
43. Saint Louis Ville SLV	16 01	16 30	-	P	2	2	0	0	2	15	60	175	113	26	3	4	404
				DP	0	0	0	0	0	3	26	94	58	6	0	0	
				PE	134	130	169	154	150	141	145	136	138	144	129	129	1699
44. Saraya SRY	12 47	11 47	186	P	0	0	0	3	52	163	270	362	298	107	4	2	1262
				DP	0	0	0	0	22	115	214	255	183	45	0	0	
				PE	132	135	174	182	184	151	120	100	107	126	120	116	1647
45. Sedhou SDO	12 42	15 33	15	P	0	0	0	0	12	125	278	428	328	132	6	1	1311
				DP	0	0	0	0	2	93	210	321	248	70	0	0	
				PE	131	134	165	174	181	161	127	119	125	137	122	120	1696
46. Sefa-Sedhiou SSO	12 47	15 33	10	P	0	0	0	0	11	115	279	415	299	132	6	1	1257
				DP	0	0	0	0	3	77	208	289	234	71	0	0	
				PE	131	134	165	174	181	161	127	119	125	137	122	120	1696
47. Tambacounda TBC	13 46	13 41	49	P	0	0	0	2	19	121	191	272	221	73	2	0	904
				DP	0	0	0	0	4	77	150	195	155	29	0	0	
				PE	129	133	173	176	192	145	112	100	106	119	115	117	1617
48. Thiadiaye TDY	14 25	16 42	8	P	0	0	0	0	2	30	142	259	230	60	0	0	725
				DP	0	0	0	0	0	15	76	152	137	11	0	0	
				PE	137	133	160	173	167	163	137	130	135	145	135	135	1750
49. Thilmaka TLK	15 02	16 15	-	P	0	2	0	0	7	33	123	226	150	58	2	4	606
				DP	0	0	0	0	0	9	75	137	96	31	0	0	
				PE	132	131	167	172	165	155	137	128	134	142	125	126	1714
50. Tivaouane TVN	14 57	16 49	55	P	0	1	0	0	3	20	99	226	184	51	2	3	589
				DP	0	0	0	0	0	5	48	135	124	11	0	0	
				PE	140	133	162	173	164	165	145	137	140	146	140	142	1788

Table continued

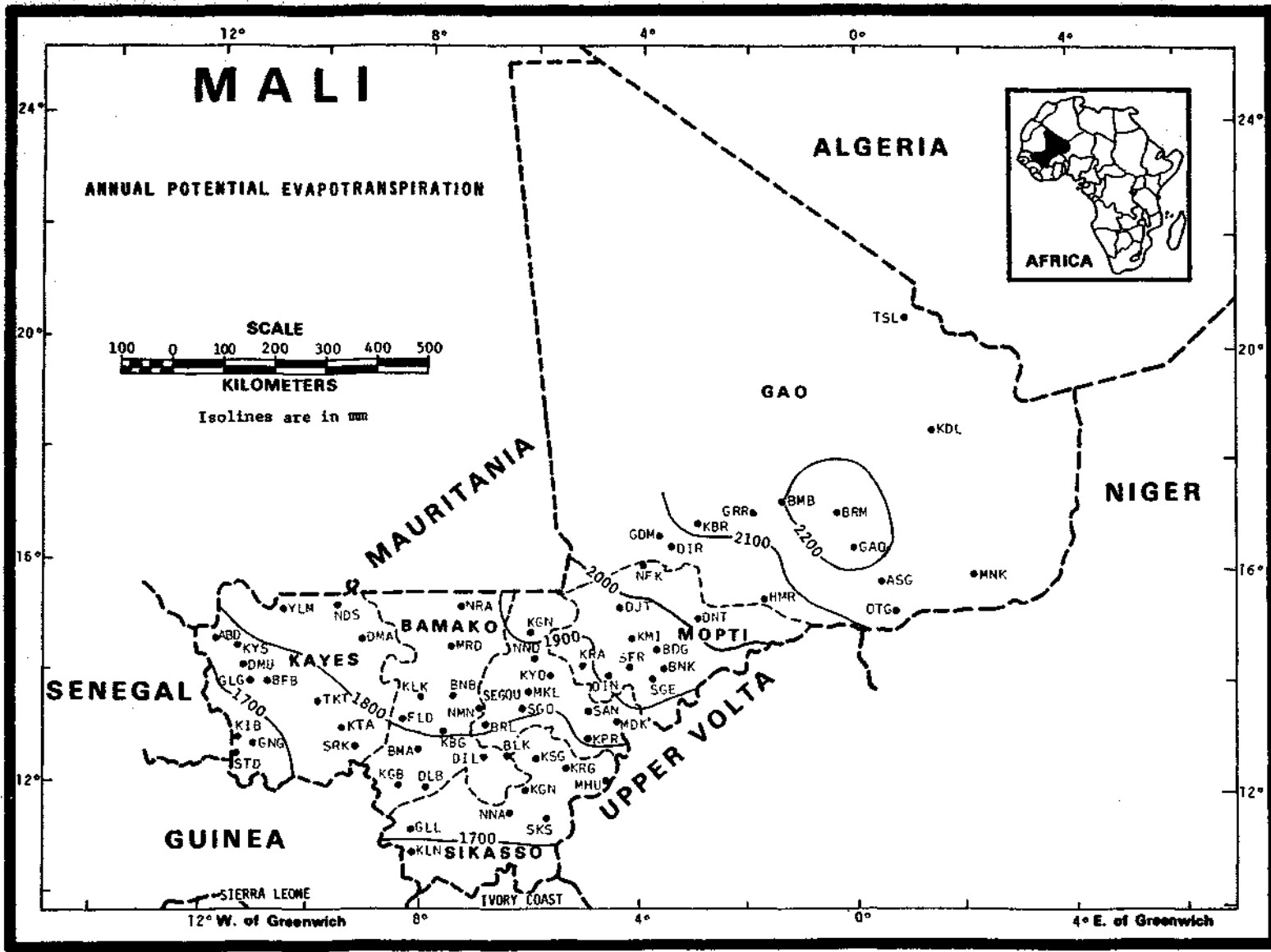
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	O	1	O	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
51. Velingara-Casamance VLG	13	09	14	06	38	P	0	0	0	3	27	133	214	312	276	99	5	0	1070
						DP	0	0	0	0	5	95	163	225	204	50	0	0	
						PE	121	134	173	176	189	151	120	111	115	130	117	117	1654
52. Ziguinchor ZGR	12	33	16	16	26	P	0	0	0	0	7	122	348	538	354	146	7	0	1523
						DP	0	0	0	-0	2	78	274	416	284	88	0	0	
						PE	133	134	158	174	177	161	131	125	128	140	125	123	1709
<b>MALI</b>																			
1. Ambibedi AOB	14	35	11	47	30	P	0	0	0	0	18	113	164	256	170	44	1	0	766
						DP	0	0	0	0	4	81	122	197	124	13	0	0	
						PE	134	137	183	192	212	168	143	115	120	135	124	121	1784
2. Ansongo ASG	15	40	00	30	246	P	0	0	0	0	16	28	74	134	38	8	0	0	299
						DP	0	0	0	0	2	11	38	83	16	2	0	0	
						PE	143	165	212	218	234	219	195	160	170	175	146	137	2174
3. Bafoulabe BFB	13	48	10	50	104	P	0	0	0	4	29	120	208	303	198	54	3	0	920
						DP	0	0	0	0	10	84	149	229	132	20	0	0	
						PE	135	139	187	194	197	162	135	113	121	134	124	123	1764
4. Bamako-Aero BMA	12	38	08	02	332	P	0	0	4	17	63	142	241	325	213	63	9	0	1079
						DP	0	0	1	5	33	106	195	256	157	27	0	0	
						PE	143	160	204	198	185	152	125	113	119	135	128	134	1796
5. Bamako Zoo Ifan BMI	12	40	07	59	362	P	0	0	4	15	53	143	246	298	215	58	7	0	1039
						DP	0	0	1	3	23	108	207	232	158	16	0	0	
						PE	150	162	204	198	186	157	127	114'	120	136	128	135	1817
6. Bamba BMB	17	02	01	24	259	P	0	0	0	0	4	20	51	87	29	3	0	0	196
						DP	0	0	0	0	1	6	25	53	9	1	0	0	
						PE	137	165	213	227	240	220	185	169	174	177	146	137	2190
7. Banamba BNB	13	33	07	27	379	P	0	0	6	9	29	96	196	267	153	36	3	0	796
						DP	0	0	1	2	9	69	156	202	101	9	0	0	
						PE	145	155	203	201	195	171	140	119	126	139	129	130	1853
8. Bandiagara BDG	14	21	03	37	392	P	0	0	2	9	19	72	149	200	112	26	2	0	590
						DP	0	0	0	1	7	50	106	142	79	10	0	0	
						PE	147	163	209	220	209	186	155	135	135	148	136	129	1972

Table continued



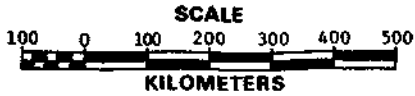
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	O	1	o	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
9. Bankass BNK	14	04	03	31	294	P	0	0	4	6	26	69	160	187	115	24	3	0	593
						DP	0	0	0	1	11	48	106	152	82	7	0	0	
						PE	148	160	207	205	198	182	151	131	133	148	134	129	
10. Baroueli BRL	13	04	06	50	309	P	0	0	3	18	33	92	200	239	121	28	3	0	738
						DP	0	0	0	5	14	56	115	136	70	8	0	0	
						PE	144	155	188	190	190	165	136	119	125	139	129	130	
11. Beleko BLK	12	29	06	25	306	P	0	0	3	26	54	131	205	293	170	51	4	1	938
						DP	0	0	0	4	34	106	164	232	133	20	0	0	
						PE	143	160	180	183	184	150	127	117	120	138	129	138	
12. Bourem BRM	16	57	00	21	273	P	0	0	0	0	4	14	47	58	21	4	0	0	149
						DP	0	0	0	0	1	4	26	29	9	0	0	0	
						PE	137	165	188	224	245	227	195	175	181	182	147	140	
13. Diamou DMA	14	06	11	16	60	P	0	0	0	2	17	109	187	263	169	41	4	0	790
						DP	0	0	0	0	6	73	145	211	126	11	0	0	
						PE	135	150	185	194	210	165	140	114	121	135	123	122	
14. Diema DMA	14	33	09	11	252	P	0	0	0	5	13	69	168	230	131	32	2	0	651
						DP	0	0	0	1	3	39	122	181	89	12	0	0	
						PE	142	160	202	207	215	178	147	120	128	139	128	125	
15. Dioila DIL	12	29	06	48	315	P	0	0	5	25	57	122	208	305	169	54	3	2	949
						DP	0	0	0	8	36	95	151	243	117	21	0	0	
						PE	145	163	185	185	184	152	127	115	120	137	129	136	
16. Dire DIR	16	16	03	24	265	P	0	0	0	1	6	18	74	119	45	8	0	0	271
						DP	0	0	0	0	1	6	44	74	27	2	0	0	
						PE	139	157	212	229	223	207	165	154	155	161	149	132	
17. Djenne DJN	13	54	04	34	278	P	0	0	2	5	33	82	162	209	101	17	1	0	613
						DP	0	0	0	2	12	44	115	149	70	5	0	0	
						PE	146	160	203	204	198	180	149	128	131	145	133	128	
18. Dogo- Tenenkou DGT	15	10	04	26	264	P	0	0	1	2	12	50	135	194	72	6	1	0	475
						DP	0	0	0	1	3	24	80	131	41	1	0	0	
						PE	144	163	211	223	215	189	158	140	138	149	137	129	

Table continued

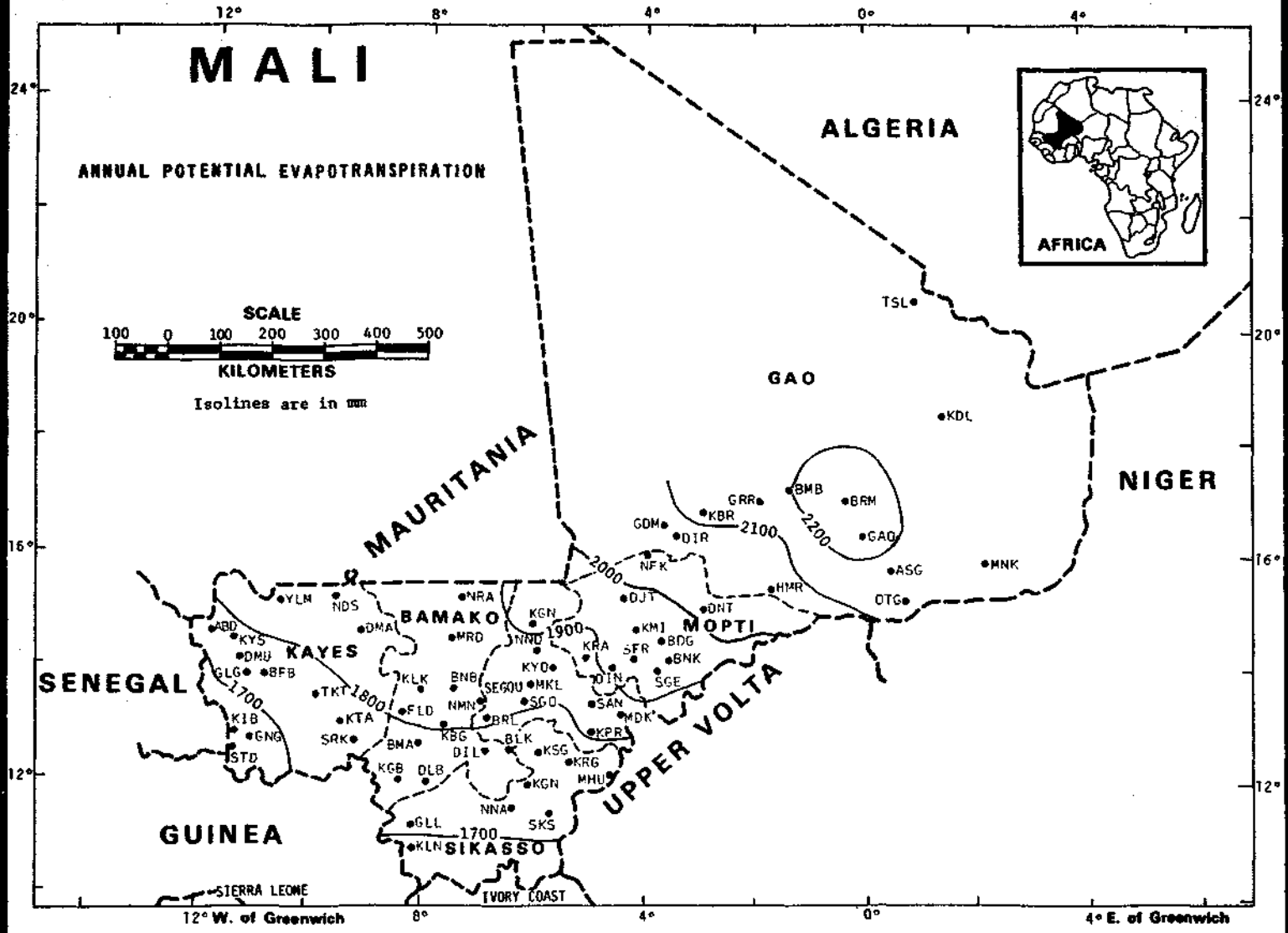


# MALI

ANNUAL POTENTIAL EVAPOTRANSPIRATION



Isohines are in mm





Location	Latitude o 1	Longitude o 1	Elevation (m)		P, DP and PE (mm)												Annual
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
19. Douentza DNT	14 59	02 57	305	P	0	0	2	4	17	67	132	167	87	19	0	0	497
				DP	0	0	0	1	4	39	97	126	50	4	0	0	
				PE	145	161	210	223	211	198	160	113	116	151	110	130	
20. Dounfing DNF	12 41	08 03	389	P	0	0	1	19	54	133	244	321	187	50	10	0	1020
				DP	0	0	1	4	22	96	182	244	147	21	0	0	
				PE	118	160	202	199	186	158	127	114	120	136	128	131	
21. Faladye FLD	13 08	08 21	337	P	0	0	5	11	49	123	243	318	197	58	6	0	1011
				DP	0	0	1	3	21	91	196	236	153	24	0	0	
				PE	147	160	203	200	190	160	130	114	122	136	128	133	
22. Galougo GLG	13 50	11 04	91	P	0	0	0	2	31	134	206	280	187	48	3	0	892
				DP	0	0	0	0	13	105	156	220	139	19	0	0	
				PE	131	165	185	193	196	160	130	113	120	133	123	121	
23. Gao GAO	16 16	00 03	258	P	0	0	0	1	6	25	72	111	36	5	0	0	258
				DP	0	0	0	0	1	10	46	76	17	2	0	0	
				PE	141	165	213	221	216	227	200	171	182	181	117	141	
24. Goualala GLL	11 13	08 14	350	P	0	5	13	48	91	172	267	372	275	121	18	0	1384
				DP	0	0	2	32	67	151	225	289	212	65	0	0	
				PE	113	163	181	185	173	117	122	109	113	133	127	129	
25. Goundam GNM	16 25	03 40	269	P	0	0	0	0	3	19	72	100	46	7	0	0	248
				DP	0	0	0	0	0	8	40	67	17	2	0	0	
				PE	138	161	213	230	221	203	161	153	153	160	112	132	
26. Gourma- Rharous GRR	16 53	01 56	266	P	0	0	1	1	4	13	54	73	27	3	0	0	176
				DP	0	0	0	0	1	4	26	44	12	1	0	0	
				PE	137	161	213	228	238	218	182	166	171	173	115	136	
27. Guene-Gore GNG	12 44	11 01	240	P	0	0	0	8	63	182	260	387	265	108	13	0	1287
				DP	0	0	0	2	28	131	220	308	224	56	0	0	
				PE	132	137	180	187	183	118	123	109	116	129	123	122	
28. Hombori HMR	15 17	01 42	287	P	0	0	0	2	9	42	116	164	68	10	0	0	413
				DP	0	0	0	0	2	23	81	121	42	2	0	0	
				PE	113	163	211	221	217	208	170	150	150	161	144	135	

Table continued

Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	o	1	O	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
29.Kabara KBR	16	42	02	59	267	P	0	0	0	1	2	18	58	92	34	4	0	0	210
						DP	0	0	0	0	0	5	37	56	14	1	0	0	
						PE	137	163	213	230	233	209	172	159	163	166	144	134	2123
29.Kalana KLN	10	47	08	12	379	P	2	2	15	49	107	159	247	340	260	112	30	4	1328
						DP	0	0	3	22	64	105	150	245	207	56	0	0	
						PE	142	143	178	182	169	145	122	108	112	133	127	128	1689
30.Kami KMI	14	34	04	13	272	P	0	0	0	5	25	61	155	192	92	90	0	1	552
						DP	0	0	1	2	11	38	116	140	65	4	0	0	
						PE	146	162	218	219	210	186	155	136	135	147	135	129	1978
31.Kangaba KGB	11	56	08	25	370	P	0	0	4	26	66	160	222	319	229	81	13	0	1122
						DP	0	0	1	9	40	125	174	243	162	39	0	0	
						PE	146	153	190	192	179	148	123	111	113	133	127	132	1747
32.Kara KRA	14	09	05	01	271	P	0	0	0	3	24	63	158	225	85	15	0	2	575
						DP	0	0	0	1	9	40	128	177	56	3	0	0	
						PE	141	153	193	195	199	180	150	130	131	144	133	127	1876
33.Karangasso KRA	12	17	05	16	392	P	0	2	7	26	90	130	223	301	185	62	9	3	1037
						DP	0	0	2	12	49	100	180	252	143	37	0	0	
						PE	140	160	183	179	180	147	127	118	119	139	129	134	1755
34.Katibougou KBG	12	56	07	32	326	P	0	0	6	13	43	121	197	280	168	44	4	0	878
						DP	0	0	1	5	19	86	149	212	117	13	0	0	
						PE	147	162	201	195	187	158	127	115	121	137	129	135	1814
35.Kayes KYS	14	26	11	26	46	P	0	0	0	1	18	98	170	239	159	43	3	0	732
						DP	0	0	0	0	4	58	129	179	114	12	0	0	
						PE	139	146	190	200	260	173	144	117	127	137	126	124	1883
36.Kayo KYO	13	54	05	37	278	P	0	0	0	5	25	72	172	240	131	25	0	2	674
						DP	0	0	0	1	10	42	143	182	92	5	0	0	
						PE	139	149	186	191	198	177	145	126	129	143	133	127	1843
37.Ke-Macina KMN	13	57	05	22	277	P	0	0	0	7	19	64	151	207	103	12	1	0	565
						DP	0	0	0	2	5	31	108	147	66	3	0	0	
						PE	140	150	187	191	198	178	147	128	130	143	133	127	1852

Table continued

Location	Latitude o l	Longitude o l	Elevation Cm)		P, DP and PE (mm)												Annual
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
39. Kenieba KIB	12 48	11 21	136	P	0	0	0	7	54	163	265	420	294	108	10	1	1322
				DP	0	0	0	2	23	118	203	305	233	53	0	0	
				PE	130	137	179	185	185	148	123	109	114	128	122	120	1680
40. Kidal KDL	18 26	01 21	458	P	0	0	0	0	7	10	34	55	25	2	0	0	134
				DP	0	0	0	0	1	3	18	33	9	0	0	0	
				PE	132	165	210	224	240	214	182	161	174	181	147	136	2166
41. Kignan KGN	11 51	06 01	348	P	0	7	7	41	87	148	240	361	202	65	22	9	1188
				DP	0	0	2	13	57	111	198	283	148	39	0	0	
				PE	140	158	178	178	178	147	125	117	114	137	129	137	1738
42. Kimparana KPR	12 50	04 56	297	P	0	0	9	22	59	113	195	253	162	37	5	0	857
				DP	0	0	2	9	38	84	139	191	125	16	0	0	
				PE	145	157	187	182	191	160	135	121	124	142	131	129	1804
43. Kita KTA	13 04	09 27	328	P	0	0	1	12	45	157	254	359	229	70	8	0	1138
				DP	0	0	0	2	21	112	197	274	172	32	0	0	
				PE	142	151	194	197	189	163	126	113	120	133	127	130	1785
44. Kogoni KGN	14 44	06 02	273	P	0	0	2	4	11	63	153	196	105	21	2	0	558
				DP	0	0	0	0	4	30	111	139	62	5	0	0	
				PE	138	144	195	218	215	184	154	134	134	144	134	128	1922
45. Kolokani KLK	13 35	08 02	399	P	0	0	4	9	40	99	202	259	154	41	4	0	812
				DP	0	0	0	2	15	61	160	189	103	16	0	0	
				PE	139	160	204	203	195	172	139	118	126	138	129	130	1853
46. Konseguela KSG	12 24	05 53	346	P	0	0	6	21	53	134	186	300	235	61	6	0	1004
				DP	0	0	1	5	20	107	138	227	182	27	0	0	
				PE	139	158	179	181	184	150	128	118	120	138	129	135	1759
47. Koulouba KLB	12 40	08 01	485	P	0	0	7	15	52	132	227	303	194	62	4	1	998
				DP	0	0	1	3	23	102	185	230	133	25	0	0	
				PE	150	161	201	196	184	150	124	113	114	135	128	135	1791
48. Koutiala KTL	12 24	05 28	344	P	0	1	5	31	64	140	222	285	184	58	7	2	1000
				DP	0	0	1	7	35	105	180	226	137	31	0	0	
				PE	139	158	180	179	185	150	130	119	121	139	130	133	1763

Table continued

Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	O	1	O	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
49. Mahoua MHU	12	08	04	38	330	P	0	3	14	20	88	127	273	291	176	47	9	5	1054
						DP	0	0	2	5	40	91	208	235	116	22	0	0	
						PE	145	158	187	179	180	147	129	119	119	139	130	132	1764
50. Mandiakuy MDK	13	02	04	28	305	P	0	2	5	15	54	105	215	257	145	28	0	1	827
						DP	0	0	1	6	28	68	171	196	108	12	0	0	
						PE	147	157	194	194	193	165	138	122	125	143	132	129	1839
51. Markala MKC	13	41	06	05	287	P	0	0	2	12	19	70	170	225	121	24	0	0	645
						DP	0	0	0	1	6	42	133	161	83	4	0	0	
						PE	138	147	184	190	197	176	144	124	128	142	132	128	1830
52. Menaka MNK	15	52	02	13	288	P	0	0	0	0	8	25	78	116	42	6	0	0	276
						DP	0	0	0	0	2	10	49	69	20	1	0	0	
						PE	142	163	112	225	221	211	173	155	160	165	144	134	2005
53. Mopti MPT	14	31	04	06	271	P	0	0	0	5	23	61	141	194	95	20	0	0	542
						DP	0	0	0	2	7	38	100	141	66	7	0	0	
						PE	147	162	209	220	210	187	155	136	136	148	135	129	1974
54. Mourdiah MRD	14	28	07	28	314	P	0	0	2	5	15	64	152	207	94	20	0	1	560
						DP	0	0	0	1	5	33	117	155	60	6	0	0	
						PE	142	146	204	207	211	181	147	125	129	142	131	127	1892
55. M'pesoba MPB	12	37	05	42	302	P	0	0	2	14	69	141	207	325	212	52	4	3	1028
						DP	0	0	0	4	50	117	155	257	171	27	0	0	
						PE	138	157	179	190	185	152	130	119	121	138	129	134	1772
56. Nara NRA	15	10	07	17	263	P	1	0	0	3	9	48	140	193	92	18	2	0	507
						DP	0	0	0	1	2	24	103	147	61	5	0	0	
						PE	139	142	205	218	183	153	132	133	133	144	133	127	1927
57. Niafunke NFK	15	56	03	59	271	P	0	0	0	2	6	20	82	117	78	7	0	0	314
						DP	0	0	0	0	1	7	53	80	39	1	0	0	
						PE	140	163	212	229	221	199	163	150	147	154	141	131	2050
58. Niена NNA	11	25	06	21	348	P	2	5	10	38	102	147	244	337	227	98	20	5	1236
						DP	0	0	1	15	69	110	171	260	159	54	0	0	
						PE	145	154	177	177	169	142	122	113	113	136	128	135	1711

Table continued

	Location	Latitude	Longitude	Elevation (Cm)		P, DP and PE (mm)												Annual
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
59.	Ninenbale NNB	12 55	07 30	290	P	0	1	3	13	54	124	202	284	168	42	4	0	896
					DP	0	0	0	4	27	98	160	210	117	16	0	0	
					PE	148	146	187	195	199	180	148	128	130	143	133	128	
60.	Niono NNO	14 15	05 59	277	P	0	0	2	- 5	18	60	153	214	110	20	0	0	582
					DP	0	0	0	1	6	36	107	145	71	5	0	0	
					PE	136	146	187	195	199	180	148	128	130	143	133	128	
61.	Nioro Du Sahel NDS	15 14	09 36	235	P	0	0	0	5	17	66	172	249	125	25	2	0	664
					DP	0	0	0	1	3	35	114	157	79	8	0	0	
					PE	141	146	200	208	218	181	150	123	128	140	129	123	
62.	Nyamina NMN	13 19	06 59	292	P	0	0	3	7	27	94	184	237	146	23	2	0	723
					DP	0	0	0	2	11	59	140	176	99	6	0	0	
					PE	144	155	190	193	193	165	138	119	125	139	129	130	
63.	Ouatagouna OTG	15 11	00 44	250	P	0	0	0	1	9	37	94	121	63	8	0	0	334
					DP	0	0	0	0	3	14	66	68	29	2	0	0	
					PE	143	168	210	218	220	214	184	150	155	169	145	138	
64.	Ouelesse- bougou OLB	11 59	07 55	356	P	0	1	8	33	93	151	206	293	210	82	10	0	1088
					DP	0	0	1	7	57	124	174	246	162	44	0	0	
					PE	148	155	189	192	179	147	122	112	112	134	127	129	
65.	San SAN	13 17	04 54	283	P	0	0	3	14	42	102	179	248	129	27	4	0	751
					DP	0	0	1	3	21	74	143	198	88	9	0	0	
					PE	145	156	188	193	193	165	138	122	126	143	132	129	
66.	Sarafere SRF	15 49	03 42	261	P	0	0	0	0	4	22	78	121	56	12	1	0	296
					DP	0	0	0	0	0	8	53	80	34	2	0	0	
					PE	141	163	212	228	220	199	162	149	145	154	141	131	
67.	Satadougou STD	12 36	11 24	150	P	0	0	0	7	56	186	280	395	297	103	12	0	1336
					DP	0	0	0	2	13	151	232	308	243	55	0	0	
					PE	130	136	177	183	182	148	122	108	113	128	122	120	
68.	Segou SGO	13 24	06 09	288	P	0	0	3	13	26	87	184	239	128	26	3	0	709
					DP	0	0	0	2	14	59	141	188	88	8	0	0	
					PE	139	148	184	194	195	170	141	121	126	141	131	129	

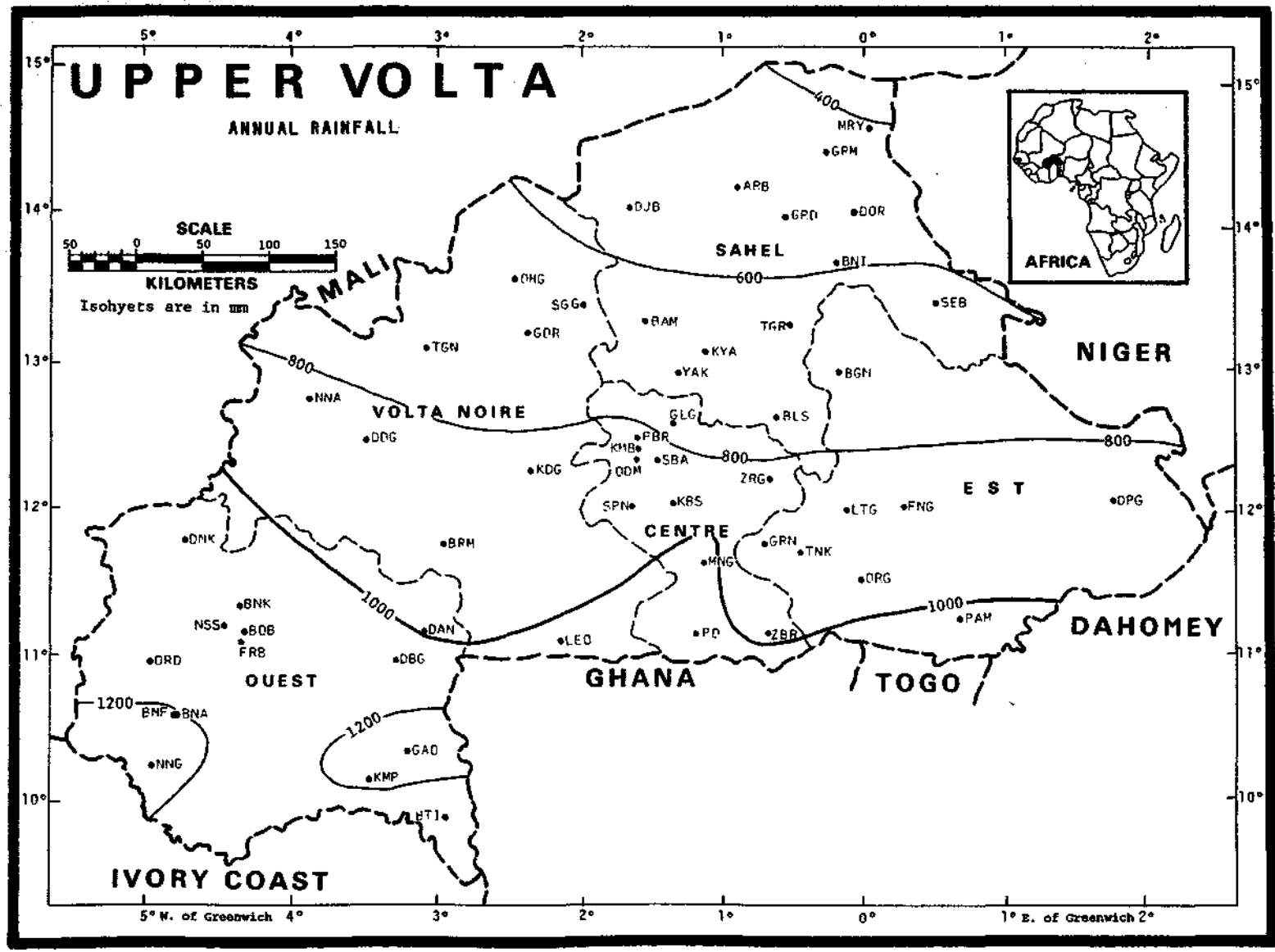
Table continued

Mali																			
Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)												
	O	1	O	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
69. Segue SGE	13	51	03	45	464	P	0	1	4	10	31	75	151	217	120	30	2	0	642
						DP	0	0	1	2	16	54	117	160	78	10	0	0	
						PE	149	159	205	218	198	119	149	128	131	146	134	129	1865
70. Sikasso SKS	11	21	05	41	374	P	0	8	16	49	110	167	271	337	244	95	15	3	1314
						DP	0	0	4	21	66	129	213	279	179	52	0	0	
						PE	140	157	177	177	170	146	123	114	113	137	129	137	1720
71. Sirakoro SRK	12	41	09	14	369	P	0	0	2	9	54	132	259	360	232	76	4	0	1128
						DP	0	0	0	2	36	100	195	302	192	33	0	0	
						PE	139	151	194	195	184	152	124	112	114	133	127	130	1755
72. Sofara SFR	14	01	04	14	271	P	0	0	0	5	22	70	137	218	100	26	1	0	581
						DP	0	0	0	1	9	47	102	169	68	9	0	0	
						PE	147	159	204	225	198	182	150	131	133	146	134	129	1938
73. Sokolo SKL	14	44	06	08	273	P	0	0	0	3	9	41	153	190	90	16	0	0	505
						DP	0	0	0	0	2	17	117	132	54	3	0	0	
						PE	136	144	194	210	213	184	153	133	133	144	133	128	1905
74. Soninkoura SNK	13	27	06	15	284	P	0	0	1	8	29	92	179	238	139	27	0	2	716
						DP	0	0	0	2	17	70	120	200	99	6	0	0	
						PE	137	148	184	187	197	174	143	123	127	142	132	128	1822
75. Sotuba STB	12	39	07	56	320	P	0	0	6	17	56	132	247	306	199	58	5	1	1027
						DP	0	0	1	4	31	103	204	238	144	23	0	0	
						PE	150	160	201	195	183	150	124	113	113	134	128	135	1786
76. Tessalit TSL	20	12	00	59	493	P	0	0	0	0	5	5	16	39	18	1	0	0	87
						DP	0	0	0	0	0	2	6	19	5	0	0	0	
						PE	126	165	205	230	240	205	279	156	172	177	147	136	2238
77. Tilembeya TLB	14	09	04	59	273	P	1	0	0	3	17	71	161	212	86	16	1	1	570
						DP	0	0	0	2	7	50	123	160	57	2	0	0	
						PE	143	154	193	194	178	180	149	129	131	144	133	128	1856
78. Tombouctou TBC	16	43	03	00	263	P	0	0	0	0	4	18	58	86	30	3	0	0	201
						DP	0	0	0	0	1	6	34	52	18	1	0	0	
						PE	138	165	212	230	232	209	170	157	161	165	143	133	2115

*Table continued*

Mali																			
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	O	l	O	l		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
79. Toukoto TKT	13	27	09	53	177	P	0	0	0	6	29	120	208	270	199	59	6	1	901
						DP	0	0	0	2	13	86	167	198	141	24	0	0	
						PE	140	118	192	197	191	163	130	114	123	131	126	126	1787
80. Yelimane YLM	15	07	10	34	97	P	0	0	0	3	12	64	164	195	120	25	3	0	587
						DP	0	0	0	0	3	36	120	142	84	8	0	0	
						PE	139	115	191	203	218	177	119	119	128	139	127	123	1858
UPPPER VOLTA																			
1. Aribinda ARB	14	14	00	52	370	P	0	0	3	3	31	67	142	174	71	19	0	0	513
						DP	0	0	1	1	12	37	98	120	47	4	0	0	
						PE	115	163	205	212	209	199	161	132	132	161	113	137	2002
2. Bam (Tourcoing) BAM	13	20	01	30	264	P	0	0	3	12	34	95	146	223	110	23	1	0	649
						DP	0	0	0	3	21	63	109	164	77	5	0	0	
						PE	117	157	199	200	197	170	144	115	127	152	131	132	1871
3. Banankele- daga BNK	11	19	04	20	329	P	1	5	23	59	98	144	240	307	207	57	15	2	1158
						DP	0	0	4	21	67	95	168	236	156	29	0	0	
						PE	118	157	187	171	163	133	123	117	118	138	128	131	1720
4. Banfora BNF	10	37	04	46	270	P	2	7	19	67	116	145	208	324	209	74	23	3	1197
						DP	0	0	4	39	73	100	158	244	154	41	0	0	
						PE	138	119	179	172	163	131	122	113	117	137	128	130	1679
5. Banfora- Agriculture BNA	10	37	04	46	270	P	1	10	21	75	116	141	220	328	201	61	21	4	1200
						DP	0	0	6	45	73	100	166	253	150	35	0	0	
						PE	138	119	179	172	163	131	122	113	117	137	128	130	1679
6. Bani BNI	13	43	00	10	310	P	0	0	7	5	35	83	143	187	112	20	3	0	597
						DP	0	0	1	1	17	45	103	126	81	4	0	0	
						PE	150	160	199	207	210	191	154	127	133	161	113	137	1978
7. Batie BTI	09	53	02	55	298	P	3	16	40	85	129	142	168	217	248	113	21	9	1191
						DP	0	2	14	56	94	104	109	157	180	52	5	1	
						PE	137	140	177	173	171	113	128	112	118	138	129	127	1696
8. Bobo- Dioulasso BOB	11	10	04	18	432	P	0	4	20	51	111	131	223	315	206	72	12	2	1148
						DP	0	0	4	27	71	102	156	244	154	37	0	0	
						PE	117	155	187	173	163	131	123	116	118	138	128	133	1712

*Table continued*





Upper Volta																			
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	0	1	0	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
9. Bogande BGN	12	59	00	08	250	P	0	0	1	19	59	88	162	201	125	21	2	0	679
						DP	0	0	0	3	32	62	122	146	83	5	0	0	
						PE	118	155	190	199	197	175	144	118	127	159	139	134	1885
10. Boromo BRM	11	44	02	55	264	P	0	2	9	35	92	122	205	275	182	48	9	2	981
						DP	0	0	2	15	56	88	153	209	135	21	1	0	
						PE	115	153	189	182	175	139	131	114	118	142	132	133	1753
11. Boulsa BLS	12	39	00	34	313	P	0	1	4	18	57	103	176	210	155	25	0	0	751
						DP	0	0	1	4	33	79	136	150	105	3	0	0	
						PE	145	152	187	195	193	163	138	114	124	153	135	133	1832
12. Dano DAN	11	09	03	04	290	P	0	7	11	66	112	138	176	242	174	54	6	4	990
						DP	0	0	3	29	78	97	119	192	137	22	0	0	
						PE	142	150	186	177	172	136	128	113	117	139	130	131	1721
13. Dedougou DDG	12	28	03	28	308	P	1	1	7	30	69	123	220	279	168	51	4	0	954
						DP	0	0	1	6	33	87	172	220	121	20	0	0	
						PE	148	157	195	184	185	148	132	117	120	143	132	129	1790
14. Diapaga DPG	12	04	01	47	270	P	0	1	6	27	83	119	175	254	165	28	5	0	863
						DP	0	0	1	10	48	90	131	189	125	7	0	0	
						PE	138	151	182	185	194	185	146	119	128	159	136	129	1852
15. Diebougou DBG	10	58	03	15	294	P	0	5	18	55	115	158	193	261	206	66	14	4	1097
						DP	0	1	4	23	72	109	141	193	159	31	2	0	
						PE	140	150	186	174	170	134	126	113	117	139	129	131	1709
16. Dionkele DNK	11	47	04	43	350	P	0	3	9	39	94	128	251	277	185	55	7	4	1054
						DP	0	0	1	22	55	90	196	230	140	25	0	0	
						PE	144	159	185	177	172	145	127	117	118	138	129	132	1743
17. Djibo DJB	14	06	01	37	274	P	0	0	3	5	25	62	130	202	106	29	3	0	567
						DP	0	0	1	1	15	28	89	140	68	6	0	0	
						PE	143	163	204	212	209	191	155	131	134	158	139	133	1972
18. Dori DOR	14	02	00	02	288	P	0	0	1	4	27	68	141	188	94	17	0	0	541
						DP	0	0	0	1	10	36	111	141	59	4	0	0	
						PE	150	163	202	209	214	200	163	135	132	166	144	138	2016

Table continued



Upper Volta																			
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	O	1	O	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
19. FadaN Gourma FNG	12	04	00	21	292	P	0	0	7	26	78	125	185	267	165	27	2	0	886
						DP	0	0	2	10	49	95	141	217	119	7	0	0	
						PE	139	148	183	191	192	162	136	113	123	150	134	131	1802
20. FarakoBa (Agro) FRB	11	06	04	23	405	P	0	3	25	44	106	141	207	277	205	58	13	1	1083
						DP	0	0	8	27	69	111	137	227	165	21	0	0	
						PE	145	155	185	173	162	131	123	116	117	137	128	133	1705
21. Gaoua GAO	10	20	03	11	333	P	2	7	33	81	141	153	210	272	229	86	21	6	1241
						DP	0	1	9	47	92	118	143	183	176	47	3	0	
						PE	138	144	179	178	172	138	127	112	117	138	129	124	1696
22. Garango GRN	11	48	00	38	275	P	0	7	12	33	90	111	193	268	184	38	2	2	940
						DP	0	0	2	9	59	83	137	213	146	10	0	0	
						PE	138	145	183	188	189	158	133	112	122	148	134	129	1779
23. Gorgadji GRD	14	02	00	31	302	P	0	0	2	2	30	95	121	163	84	10	0	2	508
						DP	0	0	0	0	9	65	88	124	63	3	0	0	
						PE	147	162	197	210	212	195	159	131	135	164	143	137	1992
24. Gorom-Goroir14 GRM	14	27	00	14	380	P	0	0	2	2	17	72	124	174	76	8	0	0	477
						DP	0	0	0	1	5	32	92	131	54	2	0	0	
						PE	148	164	205	213	218	208	179	145	144	169	146	139	2078
25. Gourcy GOR	13	12	02	21	332	P	0	0	4	18	42	95	169	205	120	32	1	1	687
						DP	0	0	0	4	25	57	135	160	95	7	0	0	
						PE	145	158	200	197	195	167	135	117	125	148	134	128	1849
26. Guilongou GLG	12	37	01	18	315	P	0	2	4	21	65	96	182	219	146	30	4	0	771
						DP	0	0	1	7	44	72	143	165	102	8	0	0	
						PE	143	152	189	195	190	151	135	113	121	149	134	133	1805
27. Kamboince KMB	12	28	01	33	300	P	0	5	3	20	63	125	177	246	156	38	1	2	838
						DP	0	0	1	6	39	92	141	196	118	10	0	0	
						PE	143	152	189	195	190	151	135	113	121	149	134	133	1805
28. Kampti KMP	10	08	03	28	340	P	2	9	40	92	134	160	166	243	238	88	23	13	1207
						DP	0	2	13	61	94	109	103	165	189	46	5	1	
						PE	138	142	178	173	171	137	127	112	117	137	128	128	1688

Table continued

Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)											Annual	
	O	1	o	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		Dec
29. Kaya KYA	13	06	01	05	313	P	0	0	3	10	47	100	159	232	124	26	3	0	706
						DP	0	0	0	2	19	69	129	173	89	7	0	0	
						PE	143	155	192	198	194	160	140	114	124	151	135	134	1840
30. Kombissir KBS	12	04	01	20	275	P	0	3	7	30	85	113	183	267	152	28	3	2	872
						DP	0	0	2	12	59	91	156	205	124	6	0	0	
						PE	140	149	187	190	187	148	133	112	119	147	133	132	1777
31. Koudougou KDG	12	16	02	22	250	P	0	1	7	24	66	111	182	263	172	46	3	1	877
						DP	0	0	1	9	37	77	136	205	126	20	0	0	
						PE	145	153	190	189	185	145	132	114	119	144	133	133	1782
32. Koupela KPL	12	11	00	21	275	P	0	1	7	24	77	113	168	246	154	32	2	0	826
						DP	0	0	1	7	37	85	130	200	114	10	0	0	
						PE	139	147	183	190	193	166	137	113	124	151	134	130	1807
33. Lantaogo LTG	12	02	00	05	325	P	0	5	11	36	80	112	208	234	162	20	0	1	870
						DP	0	0	2	11	55	76	151	188	122	6	0	0	
						PE	139	147	183	190	193	166	137	113	124	151	134	130	1807
34. Leo LEO	11	06	02	06	347	P	0	3	18	58	102	130	184	259	195	49	9	3	1010
						DP	0	0	4	28	71	100	139	196	148	18	1	0	
						PE	138	146	180	182	178	145	131	112	118	143	132	129	1734
35. Manga MNG	11	40	01	06	286	P	0	20	52	112	96	147	164	234	230	104	27	11	1197
						DP	0	3	16	70	77	111	124	178	163	64	5	0	
						PE	139	146	183	189	188	150	133	112	120	147	133	130	1770
36. Markoye MRY	14	38	00	04	295	P	0	0	0	3	13	65	98	155	69	11	0	0	416
						DP	0	0	0	1	4	29	63	124	46	2	0	0	
						PE	151	164	205	212	218	208	175	130	143	169	146	139	2060
37. Nasso NSS	11	12	04	26	335	P	1	6	23	43	103	143	211	294	211	62	12	3	1114
						DP	0	0	7	22	67	107	158	238	162	33	0	0	
						PE	145	155	185	173	162	131	123	116	112	137	128	133	1700
38. Niangoloko NNG	10	16	04	55	320	P	0	14	38	85	115	184	208	345	235	74	22	9	1331
						DP	0	2	12	49	77	136	162	270	188	39	3	1	
						PE	138	145	177	172	164	132	124	112	107	136	128	129	1664

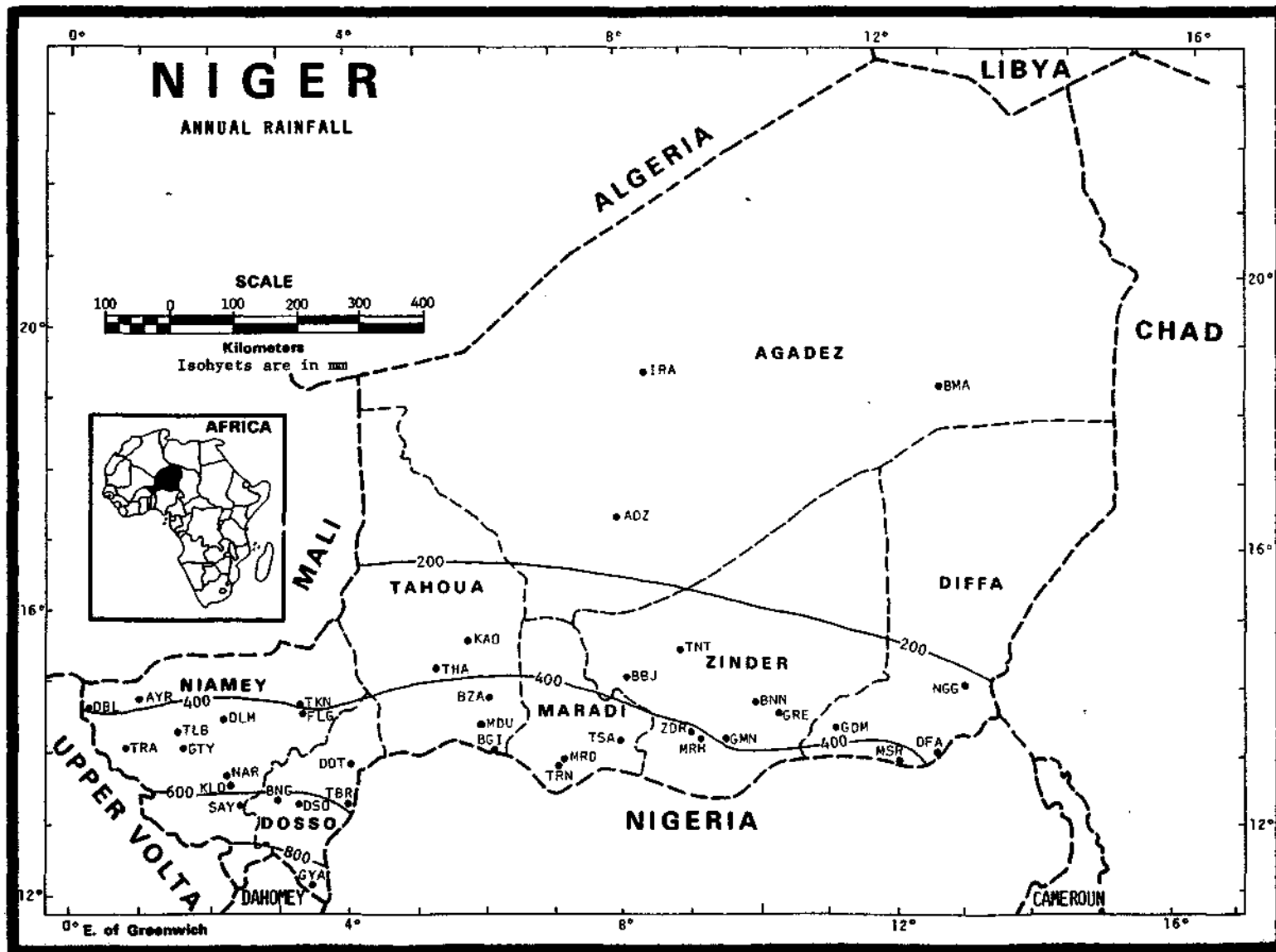
Table continued

Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)														
	0	1	0	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual		
39.Nouna NNA	12	44	03	52	280	P	0	2	3	18	61	117	189	259	135	44	3	2	833	
						DP	0	0	0	4	35	87	149	198	90	19	0			
						PE	150	159	196	185	180	159	134	119	123	143	132	127	1807	
40.Orodara ORD	10	59	04	55	523	P	2	3	26	50	92	148	212	308	220	75	27	4	116B	
						DP	0	0	8	28	62	122	171	260	171	42	10	0		
						PE	139	154	180	176	163	156	122	114	117	137	128	132	1715	
41.Ouagadougou Mission ODH	12	22	01	32	296	P	0	1	4	23	72	107	176	247	133	30	3	0	797	
						DP	0	0	1	7	34	76	139	194	95	9	0	0		
						PE	143	152	189	195	190	151	135	113	121	149	134	133	1805	
42.Ouahigouya OHG	13	35	02	26	329	P	0	0	2	10	38	98	173	223	119	26	1	0	692	
						DP	0	0	0	2	14	70	134	170	87	7	0	0		
						PE	145	159	202	200	197	174	145	119	128	149	134	128	1880	
43.Ouargaye ORG	11	32	00	01	285	P	0	3	17	43	69	96	167	243	185	27	4	0	853	
						DP	0	0	4	19	50	72	126	199	133	13	0	0		
						PE	137	144	180	187	190	164	134	112	124	148	134	128	1782	
44.Pabre PBR	12	31	01	34	295	P	0	2	5	30	58	115	174	245	156	27	0	3	814	
						DP	0	0	2	7	39	86	130	185	118	7	0	0		
						PE	143	152	189	195	190	151	135	113	121	149	134	133	1805	
45.Pama PAM	11	15	00	42	230	P	0	4	15	44	95	130	196	268	214	49	3	0	1020	
						DP	0	0	3	22	64	110	141	208	176	22	0	0		
						PE	135	142	178	184	192	170	134	112	124	148	133	128	1780	
46.Po PO	11	10	01	09	326	P	0	5	14	46	92	142	180	282	196	45	5	2	1010	
						DP	0	0	3	22	57	103	139	215	155	21				
						PE	137	142	179	184	185	154	132	112	120	146	133	128	1752	
47.Saba SBA	12	22	01	25	300	P	0	4	5	22	61	126	185	247	141	36	2	1	831	
						DP	0	0	1	9	42	91	148	177	111	12	0	0		
						PE	143	152	189	195	190	151	135	113	121	149	134	133	1805	
48.Sapone SPN	12	03	01	36	356	P	0	2	8	33	75	127	203	269	147	40	5	2	913	
						DP	0	0	1	10	57	101	167	226	116	9	0	0		
						PE	141	150	187	190	186	147	132	112	119	147	133	132	1776	

Table continued

location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)												
	0	1	0	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
49. Sebba SEB	13	26	00	31	212	P	0	0	3	14	37	88	183	214	118	20	3	0	680
						DP	0	0	0	2	22	53	142	149	73	3	0	0	
						PE	142	158	200	199	196	170	142	116	126	149	135	130	1863
50. Seguenega SGG	13	26	01	58	307	P	0	0	3	16	43	121	183	216	119	21	2	1	726
						DP	0	0	0	3	19	97	127	177	92	4	0	0	
						PE	142	158	200	199	196	170	142	116	126	149	135	130	1863
51. Sidera- dougou SDR	10	41	04	15	319	P	0	10	22	68	106	129	170	269	205	70	19	3	1071
						DP	0	0	8	38	73	101	121	186	144	40	0	0	
						PE	144	152	185	173	165	130	122	114	117	137	128	132	1699
52. Tenkodogo TNK	11	45	00	23	302	P	0	3	12	34	92	124	181	280	191	38	3	0	960
						DP	0	0	2	11	56	87	132	209	146	9	0	0	
						PE	145	145	182	188	189	162	134	112	123	148	134	129	1791
53. Tougan TGN	13	05	03	04	305	P	0	0	5	16	42	94	173	263	139	39	3	2	776
						DP	0	0	0	4	17	68	128	198	101	14	0	0	
						PE	148	158	195	192	193	164	136	118	124	145	133	127	1833
54. Tougouri TGR	13	19	00	30	280	P	0	0	4	13	35	95	162	214	112	16	2	0	654
						DP	0	0	1	2	16	66	118	162	65	3	0	0	
						PE	147	157	193	200	197	173	143	116	126	158	138	134	1882
55. Yako YAK	12	58	01	16	294	P	0	0	5	17	48	101	182	230	139	30	2	1	756
						DP	0	0	0	2	24	80	139	174	101	9	0	0	
						PE	143	155	192	198	194	160	140	114	124	151	135	134	1840
56. Zabre ZBR	11	10	00	39	296	P	1	5	16	62	99	119	176	255	183	58	5	3	983
						DP	0	0	2	33	53	93	122	211	141	17	0	0	
						PE	137	141	178	185	187	159	133	112	122	147	133	128	1762
57. Zorgho ZRG	12	15	00	37	315	P	0	1	4	29	73	108	187	255	168	30	3	0	859
						DP	0	0	1	12	39	77	139	212	135	9	0	0	
						PE	141	148	185	192	190	159	135	112	122	149	134	131	1798
<b>NIGER</b>																			
1. Agadez ADZ	12	58	07	59	498	P	0	0	0	0	0	5	8	43	84	15	0	0	157
						DP	0	0	0	0	0	3	24	54	4	0	0	0	
						PE	138	161	193	204	219	204	202	175	170	169	146	130	2111

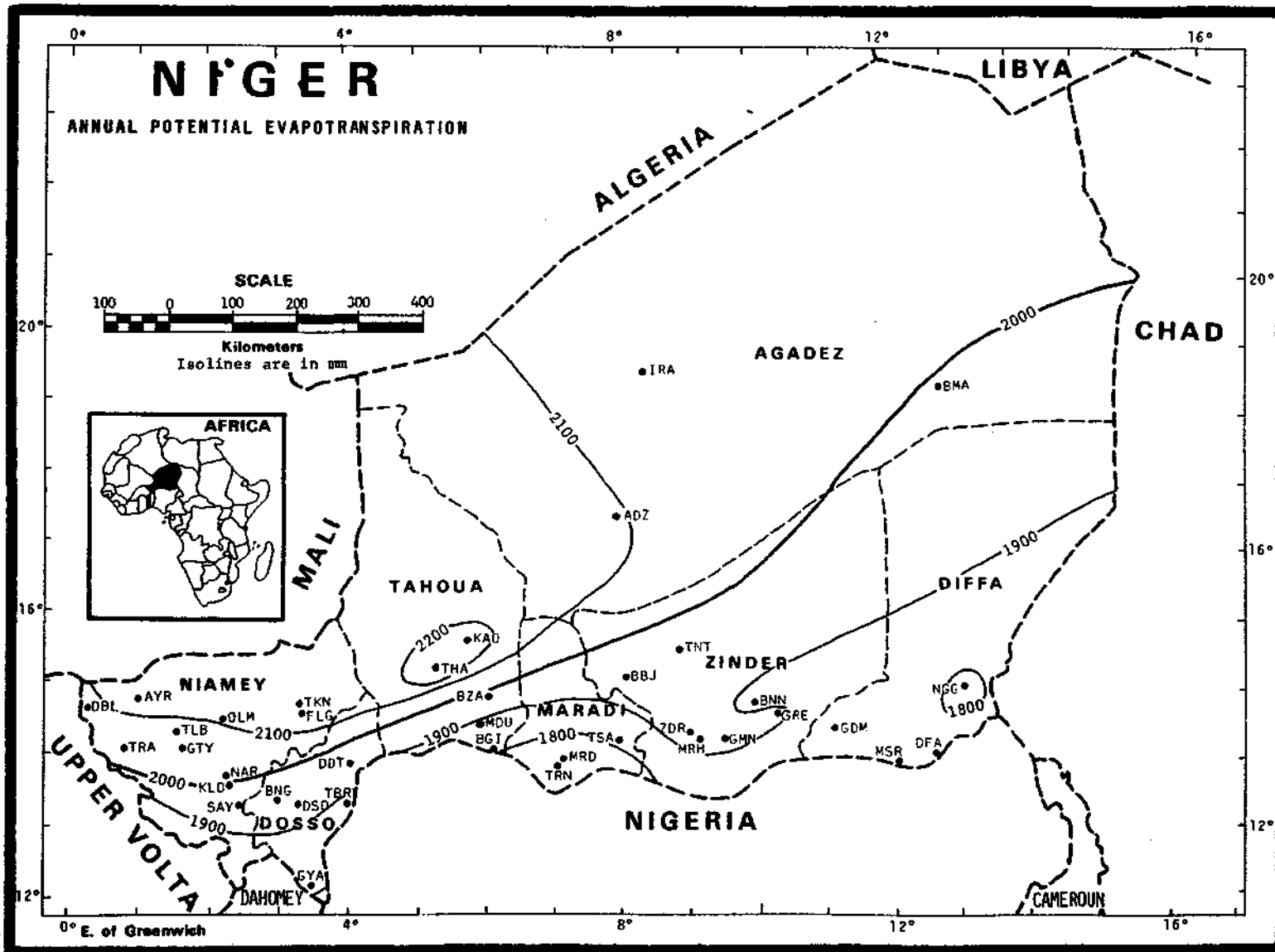
Table continued



Location	Latitude	Longitude	Elevation (m)		P, DP and PE (mm)												
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2. Ayorou AYR	14 44	00 55	223	P	0	0	0	4	7	42	95	140	45	10	2	0	346
				DP	0	0	0	0	3	21	71	93	25	2	0	0	
				PE	155	165	206	213	228	217	185	145	155	178	150	143	2140
3. Bangui BGI	13 43	06 06	350	P	0	0	0	6	20	57	148	174	66	8	0	0	479
				DP	0	0	0	0	5	25	90	127	38	1	0	0	
				PE	138	150	177	185	208	181	145	130	136	143	134	131	1858
4. Belbedji BBJ	14 39	08 04	400	P	0	0	0	0	0	20	80	116	37	3	0	0	264
				DP	0	0	0	0	0	7	54	84	22	1	0	0	
				PE	138	153	186	195	208	193	172	148	150	166	144	128	1981
5. Bilma BMA	18 41	12 55	335	P	0	0	0	0	0	0	3	11	3	2	0	0	19
				DP	0	0	0	0	0	0	1	3	0	0	0	0	
				PE	128	154	189	197	203	188	184	160	158	159	137	125	1982
6. Birni N Gaoure BNG	13 05	02 54	188	P	0	0	2	10	42	83	166	199	91	11	0	0	605
				DP	0	0	0	3	20	50	119	142	58	2	0	0	
				PE	160	160	189	191	199	195	154	129	135	168	145	135	1960
7. Birni N Konni BNN	13 48	05 15	272	P	0	0	0	3	28	69	133	215	106	11	0	0	565
				DP	0	0	0	1	10	46	95	159	64	2	0	0	
				PE	135	153	183	194	194	186	165	136	147	165	140	123	1921
8. Bouza BZA	14 25	06 03	300	P	0	0	0	3	15	44	136	191	65	8	0	0	462
				DP	0	0	0	1	3	17	95	139	33	2	0	0	
				PE	145	155	185	195	202	199	165	140	145	155	151	134	1971
9. Diffa DFA	13 19	12 37	255	P	0	0	0	0	10	23	82	169	37	9	0	0	332
				DP	0	0	0	0	2	5	54	106	11	2	0	0	
				PE	133	135	169	190	199	178	150	126	138	153	141	123	1835
10. Dogondou- tchi DDT	13 38	04 00	230	P	0	0	2	5	29	71	156	223	94	11	0	0	592
				DP	0	0	0	1	7	41	106	152	54	2	0	0	
				PE	159	158	187	190	210	195	155	132	137	164	143	137	1967
11. Dolbel DBL	14 37	00 17	300	P	0	0	0	3	9	44	110	112	58	5	0	0	341
				DP	0	0	0	1	3	22	74	90	39	2	0	0	
				PE	153	163	204	211	220	210	180	143	140	172	148	140	2084

Table continued





Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)												
	0	1	0	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
12. Dosso DSO	13	01	03	11	218	P	0	0	0	10	35	72	135	210	127	55	24	2	672
						DP	0	0	0	1	7	19	83	113	86	5	0	0	
						PE	153	158	185	188	208	189	152	128	134	165	141	134	1935
13. Filingue FLG	14	21	03	19	300	P	0	0	0	2	18	55	129	198	74	5	0	0	482
						DP	0	0	0	1	4	27	88	142	35	1	0	0	
						PE	171	173	209	210	229	206	180	142	145	180	171	147	2163
14. Gaya GYA	11	59	03	30	160	P	0	0	0	16	68	114	196	263	161	21	0	0	839
						DP	0	0	0	0	41	83	129	201	118	5	0	0	
						PE	133	118	177	178	194	187	147	119	130	150	133	126	1822
15. Gotheye GTY	13	49	01	35	220	P	0	0	2	6	20	58	143	168	85	8	0	0	491
						DP	0	0	0	1	5	44	110	118	49	2	0	0	
						PE	160	165	198	205	219	205	165	134	136	173	159	142	2061
16. Goudou- maria GDM	13	43	11	10	305	P	0	0	0	0	8	23	99	152	60	5	0	0	350
						DP	0	0	0	0	2	29	60	107	40	2	0	0	
						PE	133	134	173	190	195	182	157	129	143	159	139	123	1857
17. Goure GRE	13	59	10	16	450	P	0	0	0	0	16	27	118	159	54	3	0	0	379
						DP	0	0	0	0	3	11	71	106	29	1	0	0	
						PE	136	151	182	194	194	184	160	131	146	164	140	124	1906
18. Guidimouni GMN	13	41	09	31	370	P	0	0	0	0	10	31	119	153	59	6	0	0	378
						DP	0	0	0	0	3	16	82	99	38	1	0	0	
						PE	138	153	183	193	198	178	157	129	145	166	143	130	1913
19. Inferouane IRA	19	05	08	25	681	P	0	0	0	4	5	5	10	28	7	0	0	0	59
						DP	0	0	0	0	0	1	4	9	3	0	0	0	
						PE	128	159	197	203	218	195	197	174	172	165	142	133	2082
20. Kao KAO	15	14	05	45	400	P	0	0	0	3	8	30	103	132	45	3	0	0	324
						DP	0	0	0	1	3	12	72	97	24	0	0	0	
						PE	182	185	210	222	232	220	188	153	162	187	183	150	2274
21. Kolo KLO	13	18	02	21	210	P	0	0	0	6	33	72	158	179	105	16	0	0	568
						DP	0	0	0	2	10	43	109	125	64	3	0	0	
						PE	161	160	193	195	209	201	155	129	134	169	150	137	1993

Table continued

Niger																			
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	0	1	0	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
22. Madaoua MDU	14	07	05	59	330	P	0	0	0	5	14	46	127	200	84	7	0	0	484
						DP	0	0	0	0	2	18	87	135	37	1	0	0	
						PE	142	153	180	188	209	189	145	134	138	148	138	133	1897
23. Maina Soroa MSR	13	13	12	01	339	P	0	0	0	0	32	68	140	194	81	6	0	0	520
						DP	0	0	0	0	0	27	113	140	61	1	0	0	
						PE	134	135	168	190	190	175	149	126	139	154	141	124	1825
24. Maradi MRD	13	28	07	25	368	P	0	0	0	4	32	60	164	260	110	12	0	0	642
						DP	0	0	0	0	9	33	126	193	62	0	0	0	
						PE	119	126	153	168	189	179	143	123	134	131	125	114	1704
25. Myrriah MRH	13	43	09	09	370	P	0	0	0	4	23	45	131	211	65	7	0	0	487
						DP	0	0	0	0	3	24	92	143	39	1	0	0	
						PE	138	153	184	192	199	184	157	129	145	167	142	130	1920
26. N Guigmi NGG	14	15	13	07	286	P	0	0	0	0	7	6	58	123	18	0	0	0	213
						DP	0	0	0	0	0	1	27	72	4	0	0	0	
						PE	115	130	163	177	184	178	164	140	145	150	129	112	1787
27. Niamey Aero NAR	13	29	02	10	221	P	0	0	0	0	26	77	159	201	101	15	0	0	580
						DP	0	0	0	0	0	44	109	152	64	4	0	0	
						PE	163	165	207	202	215	204	157	131	135	172	154	141	2046
28. Ouallam OLM	14	19	02	05	250	P	0	0	1	3	32	57	133	187	68	10	0	0	491
						DP	0	0	0	1	7	30	92	136	39	2	0	0	
						PE	163	169	201	208	223	211	177	140	140	178	161	143	2114
29. Say SAY	13	06	02	21	200	P	0	0	1	10	37	99	165	223	99	22	0	0	658
						DP	0	0	0	2	15	65	115	168	64	5	0	0	
						PE	157	160	190	193	208	195	154	127	134	168	147	135	1968
30. Tahoua THA	14	54	05	18	385	P	0	0	0	0	16	51	113	141	58	11	0	0	390
						DP	0	0	0	0	0	26	80	98	34	2	0	0	
						PE	183	186	212	220	232	225	186	155	161	189	186	155	2290
31. Tanout TNT	14	58	08	53	400	P	0	0	0	0	6	24	90	118	42	2	0	0	284
						DP	0	0	0	0	0	4	57	79	12	0	0	0	
						PE	137	155	187	197	208	193	175	146	155	167	143	124	1987

Table continued

																	Niger			
Location	Latitude		Longitude	Elevation (m)		P, DP and PE (mm)														
	°	'				°	'	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
32. Tama (Agro) TRN	13	28	07	07	350	P	0	0	0	0	20	72	168	203	91	10	0	0	564	
						DP	0	0	0	0	0	45	133	160	52	1	0	0		
						PE	125	129	158	173	191	178	143	124	134	132	128	117	1732	
33. Tera TRA	14	00	00	45	300	P	0	0	0	4	37	45	177	179	88	12	0	0	483	
						DP	0	0	0	0	7	22	85	138	50	2	0	0		
						PE	154	163	200	207	218	204	166	136	137	170	149	140	2044	
34. Tessaoua TSA	13	45	07	59	370	P	0	0	0	2	25	54	152	197	82	7	0	0	520	
						DP	0	0	0	0	8	25	112	142	43	1	0	0		
						PE	125	130	165	180	190	183	153	128	140	153	134	122	1803	
35. Tibiri TBR	13	06	04	00	220	P	0	0	0	14	30	76	149	200	104	17	0	0	591	
						DP	0	0	0	2	12	48	107	172	74	2	0	0		
						PE	145	155	182	185	208	184	147	126	134	155	135	132	1888	
36. Tillabery TLB	14	12	01	27	209	P	0	0	0	0	22	56	123	189	76	11	0	0	477	
						DP	0	0	0	0	0	33	87	137	48	2	0	0		
						PE	158	167	196	208	212	210	175	140	140	177	156	143	2082	
37. Toukounous TNK	14	30	03	17	290	P	0	0	0	2	11	41	122	151	56	8	0	0	391	
						DP	0	0	0	0	4	22	87	106	28	2	0	0		
						PE	169	173	205	212	232	220	184	144	150	182	171	147	2189	
38. Zinder ZDR	13	48	08	59	451	P	0	0	0	1	21	48	144	208	65	6	0	0	493	
						DP	0	0	0	0	4	22	101	146	39	1	0	0		
						PE	137	153	183	191	198	185	156	129	145	166	142	128	1913	
<b>CHAD</b>																				
1. Abeche ABC	13	51	20	51	550	P	0	0	0	2	18	32	118	216	60	11	0	0	457	
						DP	0	0	0	0	4	15	72	145	26	2	0	0		
						PE	142	150	189	206	203	176	152	120	136	164	154	131	1923	
2. Aboudeia BAD	11	27	19	17	497	P	0	0	2	22	45	98	177	281	112	36	0	0	773	
						DP	0	0	0	8	27	67	136	233	78	8	0	0		
						PE	114	123	148	149	158	129	110	97	118	123	112	107	1488	
3. Adre ADR	13	28	22	12	783	P	0	0	1	3	24	55	176	248	85	14	0	0	607	
						DP	0	0	0	0	4	29	109	200	52	2	0	0		
						PE	140	150	181	197	200	165	145	119	137	163	151	130	1878	

*Table continued*



Chad																			
Location	Latitude		Longitude		Elevation (m)	P, DP and PE (mm)													
	O	1	o	1		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
4. Am Dam AMD	12	46	20	40	453	P	0	0	1	6	24	62	171	263	110	14	0	0	651
						DP	0	0	0	2	4	36	114	201	65	4	0	0	
						PE	135	133	160	187	188	150	131	110	122	145	130	115	
5. Am Timan Meteo AMT	11	02	20	17	436	P	0	2	7	21	67	113	187	297	140	39	1	0	874
						DP	0	0	1	8	31	70	151	240	100	14	0	0	
						PE	118	118	148	158	160	128	108	100	118	123	113	105	
6. Ati ATI	13	13	18	20	334	P	0	0	0	0	15	31	116	192	64	5	0	0	423
						DP	0	0	0	0	2	9	76	138	39	1	0	0	
						PE	140	158	170	190	205	175	141	112	130	161	145	127	
7. Baibokoum BBK	07	44	15	41	520	P	0	1	13	71	122	173	247	307	245	130	4	0	1314
						DP	0	0	2	38	91	132	201	252	187	96	0	0	
						PE	123	132	154	150	142	105	103	94	102	118	120	113	
8. Bailli BLL	10	31	16	26	330	P	0	0	4	17	58	106	190	279	174	37	0	0	865
						DP	0	0	1	8	34	74	147	231	121	13	0	0	
						PE	119	132	159	191	145	128	110	101	101	127	125	120	
9. Boro BRO	12	12	18	58	505	P	0	0	4	13	34	95	179	265	135	33	0	0	759
						DP	0	0	1	4	15	66	146	201	89	18	0	0	
						PE	114	127	147	150	172	134	119	96	119	129	111	110	
10. Bebeidjia Ircr BBI	08	41	16	34	395	P	0	0	10	52	80	149	268	286	209	76	3	0	1135
						DP	0	0	2	28	50	115	210	226	165	35	0	0	
						PE	120	128	152	150	141	110	102	94	98	119	118	113	
11. Beinamar C.F. BNM	08	40	15	23	434	P	0	0	7	50	113	150	256	301	263	84	9	0	1232
						DP	0	0	1	18	80	114	196	246	214	55	0	0	
						PE	124	133	159	157	146	114	107	97	102	123	124	117	
12. Bakamba Ferme BKM	08	43	17	21	380	P	0	0	6	50	85	143	254	275	221	53	3	0	1090
						DP	0	0	1	31	49	94	200	219	167	21	0	0	
						PE	117	124	151	148	140	111	97	93	101	118	119	110	
13. Biliam Oursy BLM	10	34	15	14	318	P	0	0	2	19	52	118	178	260	148	18	0	0	795
						DP	0	0	0	8	27	79	128	210	111	6	0	0	
						PE	135	140	185	178	175	138	125	108	109	142	140	133	

*Table continued*



Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)											Annual	
	O	1	O	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		Dec
14. Biltine BLT	14	32	20	55	512	P	0	0	0	1	7	20	95	139	35	4	0	0	302
						DP	0	0	0	0	2	4	46	65	12	0	0	0	
						PE	139	150	183	200	198	177	157	125	138	157	148	129	
15. Bokoro BKR	12	23	17	03	299	P	0	0	0	5	30	56	136	227	83	14	0	0	552
						DP	0	0	0	1	12	20	90	171	59	3	0	0	
						PE	130	160	178	185	195	164	136	108	125	150	136	128	
16. Bol BOL	13	28	14	43	291	P	0	0	0	0	8	11	69	160	46	4	0	0	297
						DP	0	0	0	0	2	2	32	94	20	1	0	0	
						PE	135	152	190	196	200	178	150	127	138	153	140	124	
17. Bongor C.F. BGC	10	16	15	24	—	P	0	0	4	26	78	134	161	268	155	25	0	0	851
						DP	0	0	1	9	46	97	124	221	119	8	0	0	
						PE	128	134	165	165	155	127	115	104	105	133	132	126	
18. Bongor Pref BGP	10	17	15	22	328	P	0	0	3	22	66	126	185	269	144	28	0	0	841
						DP	0	0	1	6	37	93	146	211	116	9	0	0	
						PE	130	135	170	168	158	133	117	105	108	137	135	129	
19. Bousso Meteo BSM	10	29	16	43	336	P	0	0	5	29	58	129	222	289	168	39	3	0	947
						DP	0	0	0	11	34	92	175	231	108	10	0	0	
						PE	116	129	157	157	144	125	109	97	99	124	120	118	
20. Deli DLI	08	43	15	52	427	P	0	0	6	44	86	140	234	292	211	70	2	0	1086
						DP	0	0	1	22	54	108	181	239	171	41	0	0	
						PE	123	132	157	154	144	109	104	95	99	119	120	115	
21. Doba C.F. DBC	08	40	16	51	380	P	0	0	9	49	93	148	225	284	199	82	5	0	1093
						DP	0	0	2	26	51	111	189	233	159	38	0	0	
						PE	120	127	153	149	143	114	99	93	99	117	118	112	
22. Doba Pref DBP	08	39	16	51	387	P	0	0	9	43	86	167	228	325	207	84	3	0	1152
						DP	0	0	1	18	43	117	184	263	155	43	0	0	
						PE	120	127	153	149	143	114	99	93	99	117	118	112	
23. Doher C.F. DHC	09	03	16	17	415	P	0	0	7	32	74	135	240	305	207	59	4	0	1065
						DP	0	0	1	12	43	101	193	256	153	27	0	0	
						PE	121	130	155	153	144	115	104	95	98	119	119	114	

Table continued



																			Chad
Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)												
	o	1	O	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
24. Fianga C.F. FNG	09	56	15	11	327	P	0	0	2	21	64	128	180	251	157	35	0	0	839
						DP	0	0	0	8	38	90	157	211	122	15	0	0	
						PE	132	143	180	169	160	131	120	106	107	139	138	130	1655
25. Fianga S/Pref FNP	09	56	15	08	348	P	0	0	2	23	74	133	193	258	173	36	1	0	893
						DP	0	0	0	5	41	95	164	204	115	15	0	0	
						PE	132	143	180	169	160	131	120	106	107	139	138	130	1655
26. Gore C.F. GRC	07	55	16	38	416	P	0	0	14	49	82	159	289	321	263	90	2	1	1271
						DP	0	0	3	21	50	122	216	256	195	55	0	0	
						PE	122	128	154	148	143	108	99	93	100	117	119	111	1442
27. Goundi GND	09	22	17	22	368	P	1	4	16	38	83	117	244	268	207	59	1	0	1038
						DP	0	0	2	19	51	85	200	202	156	29	0	0	
						PE	116	124	152	148	142	115	99	93	100	118	117	110	1434
28. Gounou Gaya C.F. GGC	09	37	15	31	345	P	9	3	4	35	89	150	227	302	205	58	1	0	1084
						DP	0	0	0	18	54	119	174	229	153	14	0	0	
						PE	127	133	164	161	151	123	110	102	105	128	129	123	1556
29. Goz Beida GBD	12	14	21	25	557	P	5	1	2	8	31	78	157	231	115	19	0	0	648
						DP	0	0	0	2	12	61	121	178	74	5	0	0	
						PE	133	128	156	184	180	139	119	109	125	135	130	110	1648
30. Guidari C.F. GDC	09	16	16	40	369	P	0	0	8	37	86	133	260	307	216	75	2	0	1127
						DP	0	0	1	19	47	81	189	243	165	42	0	0	
						PE	118	127	154	151	143	117	103	94	98	119	117	113	1454
31. Kelo C.F. KLC	09	19	15	49	374	P	0	0	8	33	73	150	239	264	256	59	1	0	1083
						DP	0	0	1	13	38	108	178	224	197	41	0	0	
						PE	125	132	159	157	145	119	108	98	99	125	124	118	1509
32. Kelo S/Pref KLP	09	19	15	48	378	P	0	0	6	32	76	133	233	265	238	59	2	0	1044
						DP	0	0	1	17	51	95	178	205	183	27	0	0	
						PE	125	132	159	157	145	119	108	98	99	125	124	118	1509
33. Kokabri C.F. KKC	08	33	17	10	-	P	0	0	10	49	78	144	237	293	236	80	2	0	1130
						DP	0	0	3	28	49	116	170	238	177	43	0	0	
						PE	120	126	153	147	143	109	98	92	101	118	120	109	1436

Table continued

Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)												Annual		
	O	1	o	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
34. Koro Toro KRT	16	02	18	17	270	P	0	0	0	0	2	5	8	26	3	0	0	0	45		
						DP	0	0	0	0	0	0	3	8	1	0	0	0	0	0	0
						PE	132	138	174	184	194	177	163	144	142	153	134	123	1858		
35. Koumra C.F. KMC	08	55	17	31	-	P	0	0	8	69	100	164	230	264	234	79	2	0	1150		
						DP	0	0	2	39	67	133	183	215	178	49	0	0	0	0	
						PE	117	127	152	148	142	113	98	92	101	117	118	109	1434		
36. Koumra S/Pref KMP	08	55	17	33	393	P	0	0	7	49	96	127	215	256	203	75	3	0	1031		
						DP	0	0	2	22	62	98	159	207	154	53	0	0	0	0	
						PE	117	127	152	148	142	113	98	92	101	117	118	109	1434		
37. Kyabe C.F. KBC	09	26	18	56	389	P	0	0	7	36	78	130	228	279	202	67	2	0	1030		
						DP	0	0	2	18	52	88	169	241	159	28	0	0	0	0	
						PE	114	122	147	149	145	117	95	96	107	118	119	103	1432		
38. Kyabe S/Pref KBP	09	29	18	56	389	P	0	1	6	33	75	128	214	265	197	63	4	0	987		
						DP	0	0	1	20	39	96	159	229	156	26	0	0	0	0	
						PE	114	122	147	149	145	117	95	96	107	118	119	103	1432		
39. Lai LAI	09	24	16	18	358	P	0	0	8	34	96	138	229	309	211	57	2	0	1084		
						DP	0	0	2	13	61	95	177	241	153	29	0	0	0	0	
						PE	121	131	157	156	144	118	106	97	99	121	120	116	1486		
40. Lere C.F. LRC	09	38	14	10	-	P	0	0	3	28	83	131	170	227	183	47	0	1	874		
						DP	0	0	0	11	54	93	135	185	139	20	0	0	0	0	
						PE	140	159	199	183	170	134	123	108	108	145	147	137	1753		
41. Lere S/Pref LRP	09	39	14	13	265	P	0	0	4	29	72	126	179	215	165	42	0	0	832		
						DP	0	0	0	8	42	84	141	173	116	16	0	0	0	0	
						PE	140	159	199	183	170	134	123	108	108	145	147	137	1753		
42. Mao Meteo MMT	14	07	15	19	356	P	0	0	0	0	9	21	96	164	37	5	0	0	330		
						DP	0	0	0	0	2	7	64	112	14	1	0	0	0	0	
						PE	131	144	175	193	198	177	159	131	139	152	135	120	1854		
43. Maro MRO	08	24	18	47	395	P	0	1	19	61	87	138	230	241	199	100	7	0	1084		
						DP	0	0	3	40	58	92	172	200	150	70	0	0	0	0	
						PE	117	123	150	148	142	111	94	97	107	119	123	103	1434		

Table continued

Location	Latitude		Longitude		Elevation (m)		P, DP and PE (mm)												Annual
	O	1	O	1			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
14. Massenya MSY	11	24	16	10	328	P	0	0	0	.7	42	61	152	240	125	30	0	0	660
						DP	0	0	0	2	23	39	115	185	91	11	0	0	
						PE	130	140	176	175	179	142	127	107	119	142	135	129	1701
15. Melfi S/Pref MLP	11	04	17	56	394	P	0	0	4	14	53	120	196	280	169	48	0	0	886
						DP	0	0	2	5	25	81	147	223	130	24	0	0	
						PE	113	124	152	150	159	129	110	95	104	123	114	112	1485
16. Moissala C.F. MSC	08	23	17	47	392	P	0	0	12	67	95	163	269	286	224	91	4	2	1215
						DP	0	0	2	37	52	130	222	230	156	65	0	0	
						PE	119	124	152	147	141	114	96	94	104	118	122	106	1437
17. Moissala S/Pref MSP	08	20	17	46	382	P	0	1	9	52	86	158	243	275	218	85	7	0	1136
						DP	0	0	1	20	45	125	201	228	153	53	0	0	
						PE	119	124	152	147	141	114	96	94	104	118	122	106	1437
18. Mongo MNG	12	11	18	41	430	P	0	0	2	15	47	83	178	313	132	26	0	0	796
						DP	0	0	1	5	21	53	144	225	89	12	0	0	
						PE	113	127	147	150	165	134	118	95	108	125	118	109	1509
19. Moundou C.F. MNC	08	33	16	03	390	P	0	0	8	49	95	140	230	293	236	78	2	0	1129
						DP	0	0	2	24	59	111	175	242	190	45	0	0	
						PE	122	132	154	152	143	109	103	94	99	117	119	113	1457
20. Moundou Meteo MNM	08	34	16	05	410	P	0	0	11	62	100	158	250	311	240	82	3	0	1216
						DP	0	0	0	0	71	123	182	242	173	40	0	0	
						PE	122	132	154	152	143	109	103	94	99	117	119	113	1457
21. Moussa-Foyc> MSF	08	54	18	39	379	P	0	0	4	55	87	155	241	249	225	93	4	0	1114
						DP	0	0	2	22	50	119	186	193	174	65	0	0	
						PE	117	123	150	149	144	113	93	97	107	117	122	103	1435
2. Moussoro MSR	13	39	16	30	301	P	0	0	0	1	13	33	94	174	53	4	0	0	371
						DP	0	0	0	0	2	9	64	115	23	0	0	0	
						PE	141	157	198	205	204	177	150	123	137	158	152	130	1932
23. N'Djamena (Fort lamy) NDF	12	08	15	02	295	P	0	0	0	8	31	62	155	240	103	19	0	0	618
						DP	0	0	0	2	11	33	111	177	69	5	0	0	
						PE	146	162	206	216	212	174	137	116	132	159	157	140	1957

Table continued

Location	Latitude o 1	Longitude o 1	Elevation (m)		P, DP and PE (mm)												
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
54. Oum Hadjer OMJ	13 18	19 42	390	P	0	0	3	3	11	32	106	217	62	9	0	0	442
				DP	0	0	0	0	2	13	62	155	37	1	0	0	
				PE	136	153	169	190	200	163	140	111	129	160	138	120	1809
55. Pala C.F. PLC	09 22	14 52	422	P	0	0	1	41	91	157	232	265	194	44	5	0	1030
				DP	0	0	0	24	75	120	176	222	140	20	0	0	
				PE	120	135	169	165	155	125	113	104	107	132	135	128	1588
56. Pala Meteo PLM	09 22	14 58	420	P	0	0	5	43	102	160	232	269	191	63	4	0	1068
				DP	0	0	1	20	67	125	191	200	147	29	0	0	
				PE	129	135	169	165	155	125	113	104	107	132	135	128	1597
57. Pandzangue C.F. PDC	08 06	15 49	-	P	0	0	15	58	98	158	237	311	270	97	4	0	1246
				DP	0	0	3	32	65	125	193	260	191	57	0	0	
				PE	123	132	155	152	144	108	104	94	100	118	120	114	1464
58. Sarah Meteo SRM	09 08	18 23	365	P	0	1	13	46	89	143	231	287	208	75	3	0	1097
				DP	0	0	2	17	48	115	181	248	164	41	0	0	
				PE	111	123	130	148	142	114	92	95	106	118	121	104	1407
59. Sarah C.F. (Ft Archam) SRC	09 10	18 22	365	P	0	1	13	57	84	129	223	282	198	53	3	0	1044
				DP	0	0	2	24	49	106	175	233	147	23	0	0	
				PE	111	123	130	118	142	114	92	95	106	118	121	104	1427
60. Tikem Irct TKT	09 49	15 03	325	P	0	0	4	34	74	128	171	280	195	32	0	0	888
				DP	0	0	1	15	35	96	142	187	151	11	0	0	
				PE	132	137	170	168	158	123	116	105	110	136	137	132	1624

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## NOTES

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