

Phytosociological Research Center

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Worldwide Bioclimatic Classification System

Prof.Dr. Salvador Rivas-Martinez

(Adapted to Synoptical Table 30/08/2017)

TSHANE (BOTSWANA)

Altitude: 1118 m.

Latitude: 24°1'S Longitude: 21°53'E

Temperature observation period.: 1961-1970 (10)

Rainfall observation period....: 1958-1980 (23)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	Epi
Jan.	25.49	34.60	19.00	0.00	0.00	85.4	143.46
Feb.	25.81	27.28	24.03	0.00	0.00	74.2	128.53
Mar.	24.13	30.53	18.18	0.00	0.00	68.5	114.53
Apr.	20.07	23.73	16.58	0.00	0.00	34.6	68.66
May.	15.68	20.25	11.15	0.00	0.00	6.9	38.20
Jun.	12.33	15.90	8.10	0.00	0.00	3.4	20.85
Jul.	12.79	19.30	6.30	0.00	0.00	1.1	23.70
Aug.	15.73	17.85	13.95	0.00	0.00	0.5	40.52
Sep.	20.82	27.65	13.35	0.00	0.00	3.9	77.79
Oct.	22.85	26.35	19.85	0.00	0.00	16.1	105.90
Nov.	24.92	29.65	20.55	0.00	0.00	32.2	130.34
Dec.	26.04	29.35	22.85	0.00	0.00	36.3	153.24
Year	20.56	25.20	16.16	0.00	0.00	363	1045.7

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	446
Compensated thermicity index.....(Itc):	446
Simple continentality index.....(Ic):	13.7
Diurnality index.....(Id):	15.6
Annual ombrothermic index.....(Io):	1.47
Monthly dry ombrothermic index.....(Iod1):	0.03
Bimonthly dry ombrothermic index.....(Iod2):	0.06
Three monthly dry ombrothermic index.....(Iod3):	0.12
Four monthly dry ombrothermic index.....(Iod4):	0.21
Annual ombro-evaporation index.....(Ioe):	6.20
Annual positive temperature.....(Tp):	2467
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	409
Positive precipitation.....(Pp):	363

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	0	3	3	6	0

Latitudinal Belt...: Subtropical

Continentalty.....: Oceanic - Low Semihyperoceanic

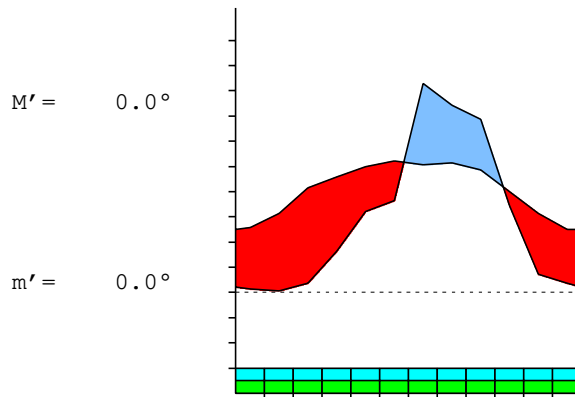
Bioclimate(Variant): TROPICAL XERIC (SEMIARID)

Bioclimatic Belt...: LOW MESOTROPICAL LOW SEMIARID

TSHANE (BOTSWANA)

1118 m

P= 363 24° 1'S 21° 53'E 10/23 y.
 T= 20.6° Ic= 13.7 Tp= 2467 Tn= 0
 m= 8.1° M= 15.9° Itc= 446 Io= 1.5



TROPICAL XERIC (SEMIARID)
 LOW MESOTROPICAL LOW SEMIARID

WATER INDEX CARD TSHANE (BOTSWANA)
 Altitude: 1118 m. Latitude: 24° 1'S

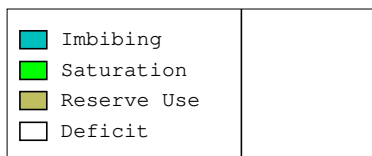
(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	12.8	24	1	0	0	1	23	0	0	-0.9
Aug.	15.7	41	1	0	0	1	40	0	0	-0.9
Sep.	20.8	78	4	0	0	4	74	0	0	-0.9
Oct.	22.9	106	16	0	0	16	90	0	0	-0.8
Nov.	24.9	130	32	0	0	32	98	0	0	-0.7
Dec.	26.0	153	36	0	0	36	117	0	0	-0.7
Jan.	25.5	143	85	0	0	85	58	0	0	-0.4
Feb.	25.8	129	74	0	0	74	54	0	0	-0.4
Mar.	24.1	115	68	0	0	68	46	0	0	-0.4
Apr.	20.1	69	35	0	0	35	34	0	0	-0.4
May.	15.7	38	7	0	0	7	31	0	0	-0.8
Jun.	12.3	21	3	0	0	3	17	0	0	-0.8
Year	20.6	1046	363	*	*	363	683	0	0	*

R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

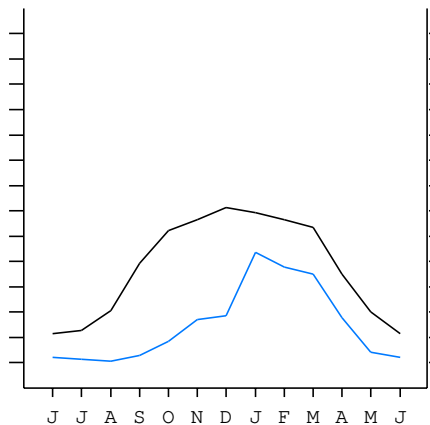
TSHANE (BOTSWANA)

24°1'S 21°53'E 1118 m 10/23 y.

T= 20.6 Ic= 13.7 TROPICAL XERIC (SEMIARID)
 m= 8.1 Tp= 2467 LOW MESOTROPICAL
 M= 15.9 Tn= 0 LOW SEMIARID
 M' = 0.0 Itc= 446
 m' = 0.0 Io= 1.5
 P= 363 mm ———
 PE= 1046 mm ———



All over the year,
 there is hydric deficit



TSHANE (BOTSWANA)

Latitude: 24°1'S Longitude: 21°53'E Altitude: 1118 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B1b]
 + Type: B. Oceanic
 + Subtype: 1. Semihyperoceanic
 + Variant: b. Low

Thermic types [A3.A2]
 + Latitudinal zone: A. Warm
 + Latitudinal belt: 3. Subtropical
 + Thermic type: A. Warm
 + Thermic subtype: 2. Warm

Bioclimatic types [A3.3b.4b]
 + Macrobioclimate: A. TROPICAL
 + Bioclimate: 3. XERIC
 + Bioclimatic variant ..:
 + Thermic type.....: 3. MESOTROPICAL
 + Thermic subtype.....: b. LOW
 + Ombrothermic type ...: 4. SEMIARID
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification: Trxe.Mtr.Sar

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 313
 Coldest semester of the year.....(Psw): 50
 Warmest four months period of the year.....(Pcm1): 228
 Following warmest four months period.....(Pcm2): 113
 Positive precipitation dryest 3 months.....(Ppd): 5
 Positive precipitation dryest 2 months.....(Ppd2): 2
 Positive precipitation dryest 1 month.....(Ppd1): 1
 Positive precipitation warmest 3 months.....(Pps): 196
 Positive precipitation warmest 2 months.....(Pps2): 122
 Positive precipitation warmest 1 month.....(Pps1): 36
 Positive precipitation coldest 3 months.....(Ppw): 11
 Positive precipitation coldest 2 months.....(Ppw2): 4
 Positive precipitation coldest 1 month.....(Ppw1): 3

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	5	52	195	109

Seasonal rainfall rhythms: S > F > P > W

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 26.0
 Average coldest month [T].....(Tmin): 12.3
 Maximum temp. warmest month [M].....(Tmmax): 34.6
 Minimum temp. coldest month [m].....(Tmmin): 6.3
 Absolute Max.temp. warmest month [M'].....(Tamax): 0.0
 Absolute Min.temp. coldest month [m'].....(Tamin): 0.0
 First warmest contrasted month [M].....(Tcmax): 34.6 (1)
 First coldest contrasted month [m].....(Tcmin): 19.0 (1)
 Dry station temperature.....(Td): 409
 Positive temperature dryest 3 months.....(Tpd): 409
 Positive temperature dryest 2 months.....(Tpd2): 285
 Positive temperature dryest 1 month.....(Tpd1): 157
 Positive temperature warmest 3 months.....(Tps): 773
 Positive temperature warmest 2 months.....(Tps2): 515
 Positive temperature warmest 1 month.....(Tps1): 260
 Positive temperature coldest 3 months.....(Tpw): 408
 Positive temperature coldest 2 months.....(Tpw2): 251
 Positive temperature coldest 1 month.....(Tpw1): 123

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SEASONAL PARAMETERS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Warmest semester...(Sms)	o	o	o							o	o	o
Dryest semester....(Smd)					o	o	o	o	o	o		
Warmest 4 months...(Cm1)	o	o									o	o
Dryest 4 months....(Cmd)						o	o	o	o			
Vegetation Activity(Pav)	o	o	o	o	o	o	o	o	o	o	o	o
Ultragelid...[M' <=0] (Pf)												
Hypergelid...[M <=0] (Pf)												
Gelid.....[T <=0] (Pf)												
Subgelid.....[m <=0] (Pf)												
Pregelid.....[m' <=0] (Pf)												
Agelid.....[m' > 0] (Pf)												
HiperAgelid..[all>0] (Pf)	o	o	o	o	o	o	o	o	o	o	o	o

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 2.88
 Mediterranean index of January.....(Im1): 1.68
 Mediterranean index of January & February.....(Im2): 1.70
 Mediterranean index of December to February...(Im3): 2.17

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	363	854	742	685	346	69	34	11	5	39	161	322
Tp	260	255	258	241	201	157	123	128	157	208	229	249
Io (Iom)	1.39	3.35	2.88	2.84	1.72	0.44	0.27	0.09	0.03	0.19	0.70	1.29
Seasons	Summer			Autumn			Winter			Spring		
Pp(x10)/Tp	1959 / 773			1100 / 599			50 / 409			521 / 686		
Io (Iot)	2.533			1.837			0.122			0.760		
Semesters	December-May						June-November					
Pp(x10)/Tp	3059 / 1372						571 / 1094					
Io (Iosm)	2.229						0.522					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 3630/2467=1.47 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	363	854	742	685	346	69	34	11	5	39	161	322
Tp [T*10]	260	255	258	241	201	157	123	128	157	208	229	249
Iom [Pp/Tp]	139	335	288	284	172	44	27	9	3	19	70	129
Avm [200-Iom]	61	***	***	***	28	156	173	191	197	181	130	71
Seasons	Summer			Autumn			Winter			Spring		
Pp / Tp	1959 / 773			1100 / 599			50 / 409			521 / 686		
Iot [Pp/Tp]	253			184			12			76		
Avs E[Avm<200]	***			***			561			382		
Lower ultrahyperarid [2]							Upper ultrahyperarid [2]					
Lower hyperarid [1]							Strong lower arid [1]					
Strong upper arid [2]							Weak lower semiarid [2]					
Weak upper semiarid [1]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin]	(Sp):	13.71
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]		36.87
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]		27.66
+ Oceanic (20<CI<40)		
CI of Currey (1974) [CI=Sp/(1+Lat/3)]		1.52
+ Subcontinental (1.1<CI<1.7)		
Rainfall Index of Lang (1925) [R=P/T]		17.66
+ Steppic (40>R>0)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)]		11.88
+ Arid -steppic- (15>Ia>5)		
I of Emberger (1930) [Q=100*P/(Tmax ² -Tmin ²)]		31.36
+ Semiarid (50>Q>30)		
I of Dantin & Revenga (1940) [DR=100*T/P]		5.66
+ Arid (6>DR>3)		
Aridity Index of UNEP [I=P/PE]		0.35
+ Semiarid (0.5>Im>0.2)		
Potential Erosion I of Fournier (1960) [K=Pi ² /P]		20.07
+ Very low (K<60)		

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate

- + Climate
- + Region
- + Thermic type: 2. Macrothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.31	0.26	0.25	0.13	0.02	0.01	0.00	0.00	0.01	0.05	0.10	0.12
T-E ratio	11.47	11.61	10.86	9.03	7.06	5.55	5.76	7.08	9.37	10.28	11.21	11.72
Precipitation-effectiveness: 12.66						Temperature-efficiency						111.00
Moisture Index [MI=100*(P-PE)/PE]												-65.29
+ D.Semiarid (-66.7<MI<-33.3)												
Index of dryness [DI=100*d/PE]												65.29
+ Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE]												0.00
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE												1045.72
+ Forth mesothermic (997<PE<1440)												

