

Phytosociological Research Center

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Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

SHAKAWE (BOTSWANA)

Altitude: 1032 m.

Latitude: 18°22'S Longitude: 21°51'E

Temperature observation period.: 1961-1970 (10)

Rainfall observation period....: 1932-1988 (57)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	Epi
Jan.	24.21	30.20	19.80	0.00	0.00	128.9	121.46
Feb.	25.21	31.15	19.45	0.00	0.00	136.6	118.09
Mar.	24.46	30.70	17.70	0.00	0.00	82.1	115.88
Apr.	23.10	27.38	18.93	0.00	0.00	23.6	92.40
May.	19.00	25.50	12.50	0.00	0.00	2.6	55.89
Jun.	16.41	20.60	12.80	0.00	0.00	0.3	36.36
Jul.	15.75	19.90	12.10	0.00	0.00	0.0	34.13
Aug.	18.55	20.73	16.18	0.00	0.00	0.2	54.17
Sep.	22.75	28.00	17.60	0.00	0.00	3.3	91.59
Oct.	25.81	28.13	23.58	0.00	0.00	14.9	138.13
Nov.	25.48	30.60	20.20	0.00	0.00	59.4	132.41
Dec.	25.18	28.08	22.23	0.00	0.00	101.9	135.57
Year	22.16	26.75	17.76	0.00	0.00	554	1126.1

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	542
Compensated thermicity index.....(Itc):	542
Simple continentality index.....(Ic):	10.1
Diurnality index.....(Id):	13.0
Annual ombrothermic index.....(Io):	2.08
Monthly dry ombrothermic index.....(Iod1):	0.00
Bimonthly dry ombrothermic index.....(Iod2):	0.01
Three monthly dry ombrothermic index.....(Iod3):	0.01
Four monthly dry ombrothermic index.....(Iod4):	0.05
Annual ombro-evaporation index.....(Ioe):	17.45
Annual positive temperature.....(Tp):	2659
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	507
Positive precipitation.....(Pp):	554

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	3	2	1	6	0

Latitudinal Belt...: Eutropical

Continentality.....: Hyperoceanic - Low Subhyperoceanic

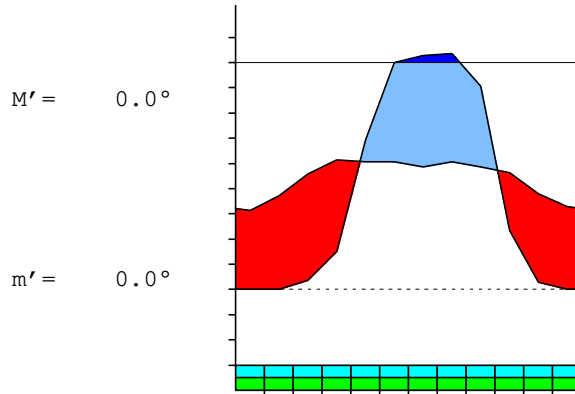
Bioclimate(Variant): TROPICAL XERIC (DRY)

Bioclimatic Belt...: UPPER THERMOTROPICAL LOW DRY

SHAKAWE (BOTSWANA)

1032 m

P= 554 18° 22' S 21° 51' E 10/57 y.
 T= 22.2° Ic= 10.1 Tp= 2659 Tn= 0
 m= 12.1° M= 19.9° Itc= 542 Io= 2.1



TROPICAL XERIC (DRY)
 UPPER THERMOTROPICAL LOW DRY

WATER INDEX CARD SHAKAWE (BOTSWANA)
 Altitude: 1032 m. Latitude: 18° 22' S

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	15.8	34	0	0	0	0	34	0	0	-0.9
Aug.	18.5	54	0	0	0	0	54	0	0	-0.9
Sep.	22.8	92	3	0	0	3	88	0	0	-0.9
Oct.	25.8	138	15	0	0	15	123	0	0	-0.8
Nov.	25.5	132	59	0	0	59	73	0	0	-0.5
Dec.	25.2	136	102	0	0	102	34	0	0	-0.2
Jan.	24.2	121	129	7	7	121	0	0	0	0.0
Feb.	25.2	118	137	18	26	118	0	0	0	0.1
Mar.	24.5	116	82	-26	0	108	8	0	0	-0.2
Apr.	23.1	92	24	0	0	24	69	0	0	-0.7
May.	19.0	56	3	0	0	3	53	0	0	-0.9
Jun.	16.4	36	0	0	0	0	36	0	0	-0.9
Year	22.2	1126	554	*	*	554	572	0	0	*

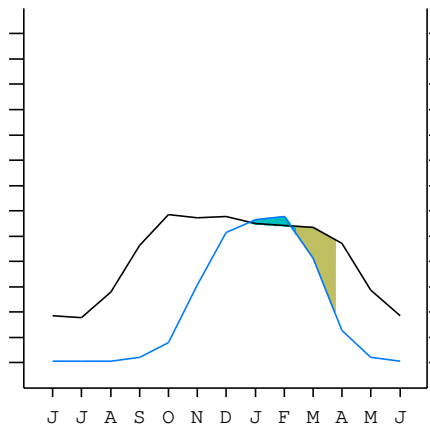
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

SHAKAWE (BOTSWANA)

18°22' S 21°51' E 1032 m 10/57 y.

T= 22.2 Ic= 10.1 TROPICAL XERIC (DRY)
 m= 12.1 Tp= 2659 UPPER THERMOTROPICAL
 M= 19.9 Tn= 0 LOW DRY
 M' = 0.0 Itc= 542
 m' = 0.0 Io= 2.1
 P= 554 mm ———
 PE= 1126 mm ———

Imbibing	25 Dec.
Saturation	11 Feb.
Reserve Use	24 Mar.
Deficit	



SHAKAWE (BOTSWANA)

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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [A3b]
 + Type: A. Hyperoceanic
 + Subtype: 3. Subhyperoceanic
 + Variant: b. Low

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

Bioclimatic types [A3.2a.5b]
 + Macrobioclimate: A. TROPICAL
 + Bioclimate: 3. XERIC
 + Bioclimatic variant .:
 + Thermic type.....: 2. THERMOTROPICAL
 + Thermic subtype.....: a. UPPER
 + Ombrothermic type ...: 5. DRY
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification: Trxe.Ttr.Dry

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 524
 Coldest semester of the year.....(Psw): 30
 Warmest four months period of the year.....(Pcm1): 305
 Following warmest four months period.....(Pcm2): 245
 Positive precipitation dryest 3 months.....(Ppd): 1
 Positive precipitation dryest 2 months.....(Ppd2): 0
 Positive precipitation dryest 1 month.....(Ppd1): 0
 Positive precipitation warmest 3 months.....(Pps): 176
 Positive precipitation warmest 2 months.....(Pps2): 74
 Positive precipitation warmest 1 month.....(Pps1): 15
 Positive precipitation coldest 3 months.....(Ppw): 1
 Positive precipitation coldest 2 months.....(Ppw2): 0
 Positive precipitation coldest 1 month.....(Ppw1): 0

Seasons	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2
Rainfall	0	77	367	108

Tropical rainfall rhythms: 1 > 2 > 4 > 3

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 25.8
 Average coldest month [T].....(Tmin): 15.8
 Maximum temp. warmest month [M].....(Tmmax): 31.1
 Minimum temp. coldest month [m].....(Tmmin): 12.1
 Absolute Max.temp. warmest month [M'].....(Tamax): 0.0
 Absolute Min.temp. coldest month [m'].....(Tamin): 0.0
 First warmest contrasted month [M].....(Tcmax): 30.7 (3)
 First coldest contrasted month [m].....(Tcmin): 17.7 (3)
 Dry station temperature.....(Td): 507
 Positive temperature dryest 3 months.....(Tpd): 507
 Positive temperature dryest 2 months.....(Tpd2): 343
 Positive temperature dryest 1 month.....(Tpd1): 158
 Positive temperature warmest 3 months.....(Tps): 765
 Positive temperature warmest 2 months.....(Tps2): 513
 Positive temperature warmest 1 month.....(Tps1): 258
 Positive temperature coldest 3 months.....(Tpw): 507
 Positive temperature coldest 2 months.....(Tpw2): 322
 Positive temperature coldest 1 month.....(Tpw1): 158

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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): 2.03
 Mediterranean index of January.....(Im1): No
 Mediterranean index of January & February.....(Im2): No
 Mediterranean index of December to February...(Im3): No

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	1019	1289	1366	821	236	26	3	0	2	33	149	594
Tp	252	242	252	245	231	190	164	158	186	228	258	255
Io (Iom)	4.05	5.33	5.42	3.36	1.02	0.14	0.02	0.00	0.01	0.14	0.58	2.33
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	3674 / 746			1083 / 666			5 / 507			775 / 740		
Io (Iot)	4.925			1.627			0.011			1.047		
Semesters	December-May						June-November					
Pp(x10)/Tp	4757 / 1412						781 / 1247					
Io (Iosm)	3.370						0.626					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 5538/2659=2.08 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	1019	1289	1366	821	236	26	3	0	2	33	149	594
Tp [T*10]	252	242	252	245	231	190	164	158	186	228	258	255
Iom [Pp/Tp]	405	533	542	336	102	14	2	0	1	14	58	233
Avm [200-Iom]	***	***	***	***	98	186	198	200	199	186	142	***
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	3674 / 746			1083 / 666			5 / 507			775 / 740		
Iot [Pp/Tp]	493			163			1			105		
Avs E[Avm<200]	***			***			597			***		
Lower ultrahyperarid [4]						Upper ultrahyperarid [2]						
Weak lower arid [1]						Strong lower semiarid [1]						

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin](Sp): 10.06
 CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]: 33.88
 CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]: 22.00
 + Oceanic (20<CI<40)
 CI of Currey (1974) [CI=Sp/(1+Lat/3)]: 1.41
 + Subcontinental (1.1<CI<1.7)
 Rainfall Index of Lang (1925) [R=P/T]: 24.99
 + Steppic (40>R>0)
 Aridity Index of Martonne (1926) [Ia=P/(T+10)]: 17.22
 + Semiarid -mediterranean- (20>Ia>15)
 I of Emberger (1930) [Q=100*P/(Tmmax²-Tmmin²)]: 67.21
 + Subhumid (90>Q>50)
 I of Dantin & Revenga (1940) [DR=100*T/P]: 4.00
 + Arid (6>DR>3)
 Aridity Index of UNEP [I=P/PE]: 0.49
 + Semiarid (0.5>Im>0.2)
 Potential Erosion I of Fournier (1960) [K=Pi²/P].....: 33.67
 + Very low (K<60)

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate: A. Warm and temperate warm
 + Region: 3. Termoxeroteric (Mediterranean warm)
 + Thermic type: 2. Macrothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.50	0.52	0.30	0.08	0.01	0.00	0.00	0.00	0.01	0.04	0.20	0.38
T-E ratio	10.89	11.34	11.01	10.40	8.55	7.38	7.09	8.35	10.24	11.61	11.47	11.33
Precipitation-effectiveness: 20.36						Temperature-efficiency: 119.66						
Moisture Index [MI=100*(P-PE)/PE]: -50.82 + D.Semiarid (-66.7<MI<-33.3) Index of dryness [DI=100*d/PE]: 50.81 + Strong deficit (33.3<DI) Index of humidity [HI=100*s/PE]: 0.00 + No surplus (0<HI<10) Potential Evapotranspiration PE: 1126.07 + Forth mesothermic (997<PE<1440)												

