

Phytosociological Research Center

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Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

GHANZI (BOTSWANA)

Altitude: 1131 m.

Latitude: 21°42'S Longitude: 21°39'E

Temperature observation period.: 1952-1980 (29)

Rainfall observation period....: 1950-1980 (31)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPi
Jan.	25.00	32.00	18.00	42.00	7.00	98.0	135.92
Feb.	24.40	32.00	18.00	38.00	7.00	94.0	111.74
Mar.	22.80	30.00	16.00	39.00	8.00	74.0	100.32
Apr.	20.60	29.00	13.00	36.00	-1.00	39.0	72.56
May.	16.70	26.00	8.00	33.00	-6.00	8.0	44.22
Jun.	13.90	23.00	4.00	32.00	-7.00	1.0	27.42
Jul.	13.90	24.00	4.00	31.00	-6.00	0.0	28.64
Aug.	16.70	27.00	6.00	38.00	-3.00	0.0	46.08
Sep.	20.60	31.00	10.00	38.00	-1.00	2.0	75.58
Oct.	24.40	33.00	15.00	39.00	1.00	21.0	122.92
Nov.	25.00	33.00	17.00	42.00	6.00	43.0	130.01
Dec.	25.00	33.00	18.00	41.00	7.00	66.0	137.10
Year	20.75	29.42	12.25	37.42	1.00	446	1032.5

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	478
Compensated thermicity index.....(Itc):	478
Simple continentality index.....(Ic):	11.1
Diurnality index.....(Id):	21.0
Annual ombrothermic index.....(Io):	1.79
Monthly dry ombrothermic index.....(Iod1):	No
Bimonthly dry ombrothermic index.....(Iod2):	No
Three monthly dry ombrothermic index.....(Iod3):	0.02
Four monthly dry ombrothermic index.....(Iod4):	0.15
Annual ombro-evaporation index.....(Ioe):	7.92
Annual positive temperature.....(Tp):	2490
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	445
Positive precipitation.....(Pp):	446

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

Latitudinal Belt...: Eutropical

Continentalty.....: Oceanic - High Semihyperoceanic

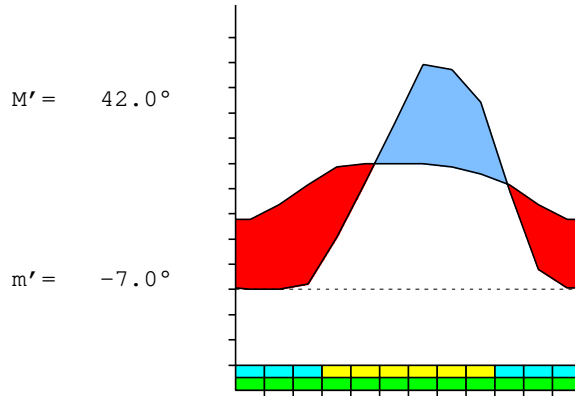
Bioclimate(Variant): TROPICAL XERIC (SEMIARID)

Bioclimatic Belt...: LOW MESOTROPICAL UPPER SEMIARID

GHANZI (BOTSWANA)

1131 m

P= 446 21° 42'S 21° 39'E 29/31 y.
 T= 20.8° Ic= 11.1 Tp= 2490 Tn= 0
 m= 4.0° M= 23.0° Itc= 478 Io= 1.8



TROPICAL XERIC (SEMIARID)
 LOW MESOTROPICAL UPPER SEMIARID

WATER INDEX CARD GHANZI (BOTSWANA)
 Altitude: 1131 m. Latitude: 21° 42'S

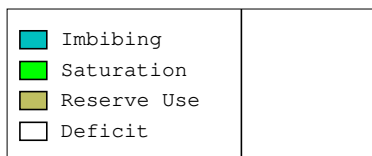
(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	13.9	29	0	0	0	0	29	0	0	-1.0
Aug.	16.7	46	0	0	0	0	46	0	0	-1.0
Sep.	20.6	76	2	0	0	2	74	0	0	-0.9
Oct.	24.4	123	21	0	0	21	102	0	0	-0.8
Nov.	25.0	130	43	0	0	43	87	0	0	-0.6
Dec.	25.0	137	66	0	0	66	71	0	0	-0.5
Jan.	25.0	136	98	0	0	98	38	0	0	-0.2
Feb.	24.4	112	94	0	0	94	18	0	0	-0.1
Mar.	22.8	100	74	0	0	74	26	0	0	-0.2
Apr.	20.6	73	39	0	0	39	34	0	0	-0.4
May.	16.7	44	8	0	0	8	36	0	0	-0.8
Jun.	13.9	27	1	0	0	1	26	0	0	-0.9
Year	20.8	1032	446	*	*	446	586	0	0	*

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

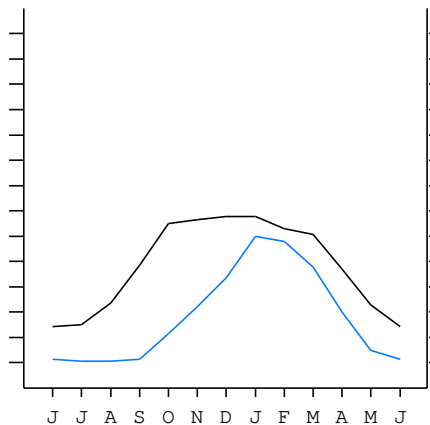
GHANZI (BOTSWANA)

21°42'S 21°39'E 1131 m 29/31 y.

T= 20.8 Ic= 11.1 TROPICAL XERIC (SEMIARID)
 m= 4.0 Tp= 2490 LOW MESOTROPICAL
 M= 23.0 Tn= 0 UPPER SEMIARID
 M' = 42.0 Itc= 478
 m' = -7.0 Io= 1.8
 P= 446 mm ———
 PE= 1032 mm ———



All over the year,
 there is hydric deficit



GHANZI (BOTSWANA)

Latitude: 21°42'S Longitude: 21°39'E Altitude: 1131 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B1a]
 + Type: B. Oceanic
 + Subtype: 1. Semihyperoceanic
 + Variant: a. High
 Thermic types [A2.A2]
 + Latitudinal zone: A. Warm
 + Latitudinal belt: 2. Eutropical
 + Thermic type: A. Warm
 + Thermic subtype: 2. Warm
 Bioclimatic types [A3.3b.4a]
 + Macrobioclimate: A. TROPICAL
 + Bioclimate: 3. XERIC
 + Bioclimatic variant ..:
 + Thermic type.....: 3. MESOTROPICAL
 + Thermic subtype.....: b. LOW
 + Ombrothermic type ...: 4. SEMIARID
 + Ombrothermic subtype : a. UPPER
 Bioclimatic Classification: Trxe.Mtr.Sar

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 396
 Coldest semester of the year.....(Psw): 50
 Warmest four months period of the year.....(Pcm1): 228
 Following warmest four months period.....(Pcm2): 215
 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): 207
 Positive precipitation warmest 2 months.....(Pps2): 109
 Positive precipitation warmest 1 month.....(Pps1): 98
 Positive precipitation coldest 3 months.....(Ppw): 9
 Positive precipitation coldest 2 months.....(Ppw2): 1
 Positive precipitation coldest 1 month.....(Ppw1): 1

Seasons	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2
Rainfall	1	66	258	121

Tropical rainfall rhythms: 1 > 2 > 4 > 3

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 25.0
 Average coldest month [T].....(Tmin): 13.9
 Maximum temp. warmest month [M].....(Tmmax): 33.0
 Minimum temp. coldest month [m].....(Tmmin): 4.0
 Absolute Max.temp. warmest month [M'].....(Tamax): 42.0
 Absolute Min.temp. coldest month [m'].....(Tamin): -7.0
 First warmest contrasted month [M].....(Tcmax): 27.0 (8)
 First coldest contrasted month [m].....(Tcmin): 6.0 (8)
 Dry station temperature.....(Td): 445
 Positive temperature dryest 3 months.....(Tpd): 445
 Positive temperature dryest 2 months.....(Tpd2): 306
 Positive temperature dryest 1 month.....(Tpd1): 139
 Positive temperature warmest 3 months.....(Tps): 750
 Positive temperature warmest 2 months.....(Tps2): 500
 Positive temperature warmest 1 month.....(Tps1): 250
 Positive temperature coldest 3 months.....(Tpw): 445
 Positive temperature coldest 2 months.....(Tpw2): 278
 Positive temperature coldest 1 month.....(Tpw1): 139

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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)				o	o	o	o	o	o			
Agelid.....[m' > 0] (Pf)	o	o	o							o	o	o
HiperAgelid..[all>0] (Pf)	o	o	o							o	o	o

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 2.32
 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)	660	980	940	740	390	80	10	0	0	20	210	430
Tp	250	250	244	228	206	167	139	139	167	206	244	250
Io (Iom)	2.64	3.92	3.85	3.25	1.89	0.48	0.07	0.00	0.00	0.10	0.86	1.72
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	2580 / 744			1210 / 601			10 / 445			660 / 700		
Io (Iot)	3.468			2.013			0.022			0.943		
Semesters	December-May						June-November					
Pp(x10)/Tp	3790 / 1345						670 / 1145					
Io (Iosm)	2.818						0.585					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 4460/2490=1.79 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	660	980	940	740	390	80	10	0	0	20	210	430
Tp [T*10]	250	250	244	228	206	167	139	139	167	206	244	250
Iom [Pp/Tp]	264	392	385	325	189	48	7	0	0	10	86	172
Avm [200-Iom]	***	***	***	***	11	152	193	200	200	190	114	28
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	2580 / 744			1210 / 601			10 / 445			660 / 700		
Iot [Pp/Tp]	347			201			2			94		
Avs E[Avm<200]	***			***			593			332		
Lower ultrahyperarid [5]							Strong lower arid [1]					
Weak upper arid [2]							Weak upper semiarid [2]					

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin]	(Sp):	11.10
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]		30.63
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]		21.91
+ Oceanic (20<CI<40)		
CI of Currey (1974) [CI=Sp/(1+Lat/3)]		1.35
+ Subcontinental (1.1<CI<1.7)		
Rainfall Index of Lang (1925) [R=P/T]		21.49
+ Steppic (40>R>0)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)]		14.50
+ Arid -steppic- (15>Ia>5)		
I of Emberger (1930) [Q=100*P/(Tmax ² -Tmin ²)]		41.57
+ Semiarid (50>Q>30)		
I of Dantin & Revenga (1940) [DR=100*T/P]		4.65
+ Arid (6>DR>3)		
Aridity Index of UNEP [I=P/PE]		0.43
+ Semiarid (0.5>Im>0.2)		
Potential Erosion I of Fournier (1960) [K=Pi ² /P]		21.53
+ 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	0.36	0.35	0.28	0.14	0.03	0.00	0.00	0.00	0.01	0.07	0.14	0.23
T-E ratio	11.25	10.98	10.26	9.27	7.52	6.25	6.25	7.52	9.27	10.98	11.25	11.25
Precipitation-effectiveness: 16.11						Temperature-efficiency						112.05
Moisture Index [MI=100*(P-PE)/PE]												-56.80
+ D.Semiarid (-66.7<MI<-33.3)												
Index of dryness [DI=100*d/PE]												56.79
+ Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE]												0.00
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE												1032.50
+ Forth mesothermic (997<PE<1440)												

