FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS
ENVIRONMENTAL RESOURCE ASSESSMENT FOR RURAL LAND USE PLANNING
GCP/YEM/021/NET
Field Document 11

AGRO-CLIMATIC RESOURCES OF YEMEN

PART 1 AGRO-CLIMATIC INVENTORY

AGRICULTURAL RESEARCH AND EXTENSION AUTHORITY
MINISTRY OF AGRICULTURE AND WATER RESOURCES
DHAMAR, REPUBLIC OF YEMEN

1997

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AGRO-CLIMATIC RESOURCES OF YEMEN

PART 1 AGRO-CLIMATIC INVENTORY

by

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1997

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Chapter 1

Introduction

This technical report deals with Yemen's agro-climatic resources inventory. The technical report is subdivided into 3 parts:

- Part 1 - Agro-climatic inventory - gives a brief characterization of the concepts of the agro-climatic inventory and the country-wide distribution of the various agro-climatic parameters. It describes the agro-climatic zones and gives a brief summary of the climatic parameters for the various agro-climatic and rainfall stations.

- Part 2 - Climatic database - describes the concepts of the agro-climatic inventory. It presents the agro-climatic database and provides the related input, output and analyses programmes.

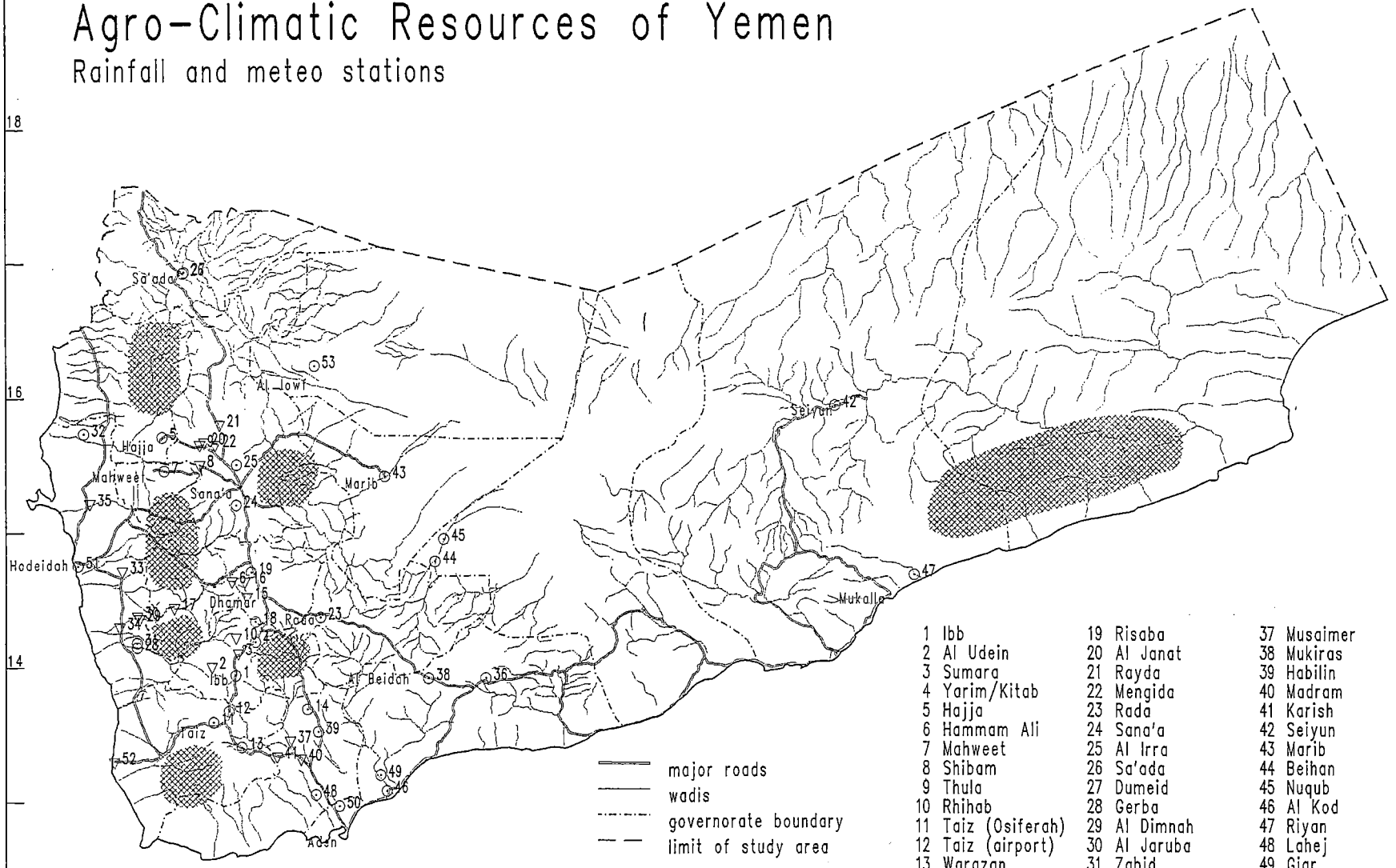
- Part 3 - The use of NDVI data for agro-climatic characterization - includes various maps based on the normalized difference vegetation index (NDVI) data derived from NOAA's AVHRR sensor and related rainfall, landform and land use data.

This report, part 1, is a supplement to the report issued by the FAO project YEM 87/002, field document 5: 'Agro-climatic characterization of the northern governorates of Yemen'. For the present agro-climatic inventory use is made of the climatic database initiated by the above mentioned project. The data have been complemented with information from the southern governorates and recent years.

For the agro-climatic zonation intensive and extensive use has been made of NDVI data derived from NOAA's AVHRR sensor over the period 1981-1991 in particular for those areas that have no recording stations and for correlation between the various areas.

Agro-Climatic Resources of Yemen

Rainfall and meteo stations



1	Ibb	19	Risaba	37	Musaimer
2	Al Udein	20	Al Janat	38	Mukiras
3	Sumara	21	Rayda	39	Habilin
4	Yarim/Kitab	22	Mengida	40	Madram
5	Hajja	23	Rada	41	Karish
6	Hammam Ali	24	Sana'a	42	Seiyun
7	Mahweet	25	Al Irra	43	Marib
8	Shibam	26	Sa'ada	44	Beihan
9	Thula	27	Dumeid	45	Nuqub
10	Rhihab	28	Gerba	46	Al Kod
11	Taiz (Osiferah)	29	Al Dimnah	47	Riyan
12	Taiz (airport)	30	Al Jaruba	48	Lahej
13	Warazan	31	Zabid	49	Giar
14	Dhala	32	As Zuhra	50	Fiyush
15	Al Sanam	33	Al Khalifah	51	Hodeidah
16	Al Masna'ah	34	Al Mahatt	52	Mokha
17	Habaka	35	Ad Dahi	53	Al Jowf
18	Dhamar	36	Moudia	54	Socotra

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Chapter 2

Agro-climatic inventory

2.1 Climatic influences[1]

Yemen has predominantly a semi-arid to arid climate. Rainy seasons occur during the spring and the summer. Three large bodies of water affect the climate of Yemen: the Indian Ocean (including the Gulf of Aden and the Arabian Sea), the Red Sea and the Mediterranean Sea. They are the sources of moisture for the passing air masses.

The rainfall depends on two main mechanisms, the Red Sea Convergence Zone (RSCZ) and the monsoonal Intertropical Convergence Zone (ITCZ). The RSCZ is active from March to May. Its influence is most noticeable at the higher altitudes in the western part of the country. The ITCZ reaches Yemen in July-September, moving north and then south again so that its influence lasts longer in the south. Rainstorms observed during the winter months of December and January are attributed to the influence of the Mediterranean Sea.

The climate of Yemen is strongly influenced by the mountainous nature of the country. The topography is dominated by mountain ranges running parallel to the Red Sea coast, with three ridges interspersed by upland plains. These mountain ranges rise from sea level to over 3600 m within 100 km from the Red Sea coast. In the southern part of the country these mountain ranges merge with ranges running parallel to the coast of the Gulf of Aden, which reach altitudes of about 2000 m.

Seaward exposed escarpments such as the Western and Southern Slopes receive more rainfall than the zones facing the interior. Local topographic features cause similar leeside effects.

Average temperatures decrease more or less linearly with altitude. The rise of the air masses over the mountains provides a cooling mechanism, which stimulates the rainfall.

Map 1 shows the locations of the meteorological and rainfall stations used for this study, while in Annex 1 the average values for the main climatic parameters and 10-day period rainfall over several years for the various stations are given. Some stations have records over a period of 12 years or longer, but most stations have more restricted recordings. The data are collected by different authorities and organizations. Standardization in observational equipment and practices is low, while recording and the quality of the data are often poor due to

[1] derived from WRAY (1995) and Farquharson (1996)

difficult access, limited funds and lack of maintenance, spare parts and supervision.

2.2 Precipitation

Precipitation in Yemen comes mainly in the form of rain. Hail is not uncommon at higher altitudes (above 1800 m) and snow occurs occasionally. Mist in the highlands and dew in desert areas contribute to the moisture, but amounts are not recorded.

The variability in the rainfall both over time and space is considerable. Rainfall occurs prodominantly in the form of rainstorms with a limited areal extend. This results in great differences in amounts of rainfall over relatively short distances. A certain year may be relatively wet in one area of Yemen, but rather dry in other areas, even if the distance is only modest.

There is a clear relationship between mean annual rainfall and topography. Rainfall rises from less than 50 mm along the Red Sea and Gulf of Aden coasts to a maximum of 500-800 mm in the Western Highlands and decreases steadily to below 50 mm inland (Map 2).

Along the coasts and inland the seasonal rainfall distribution has no clear pattern. The western and southern highlands have a bimodal distribution of the rains. Towards the south, where the ITCZ is more pronounced, the summer period tends to be more reliable, while in the north-western part of the country the spring period is more reliable.

2.3 Evapotranspiration

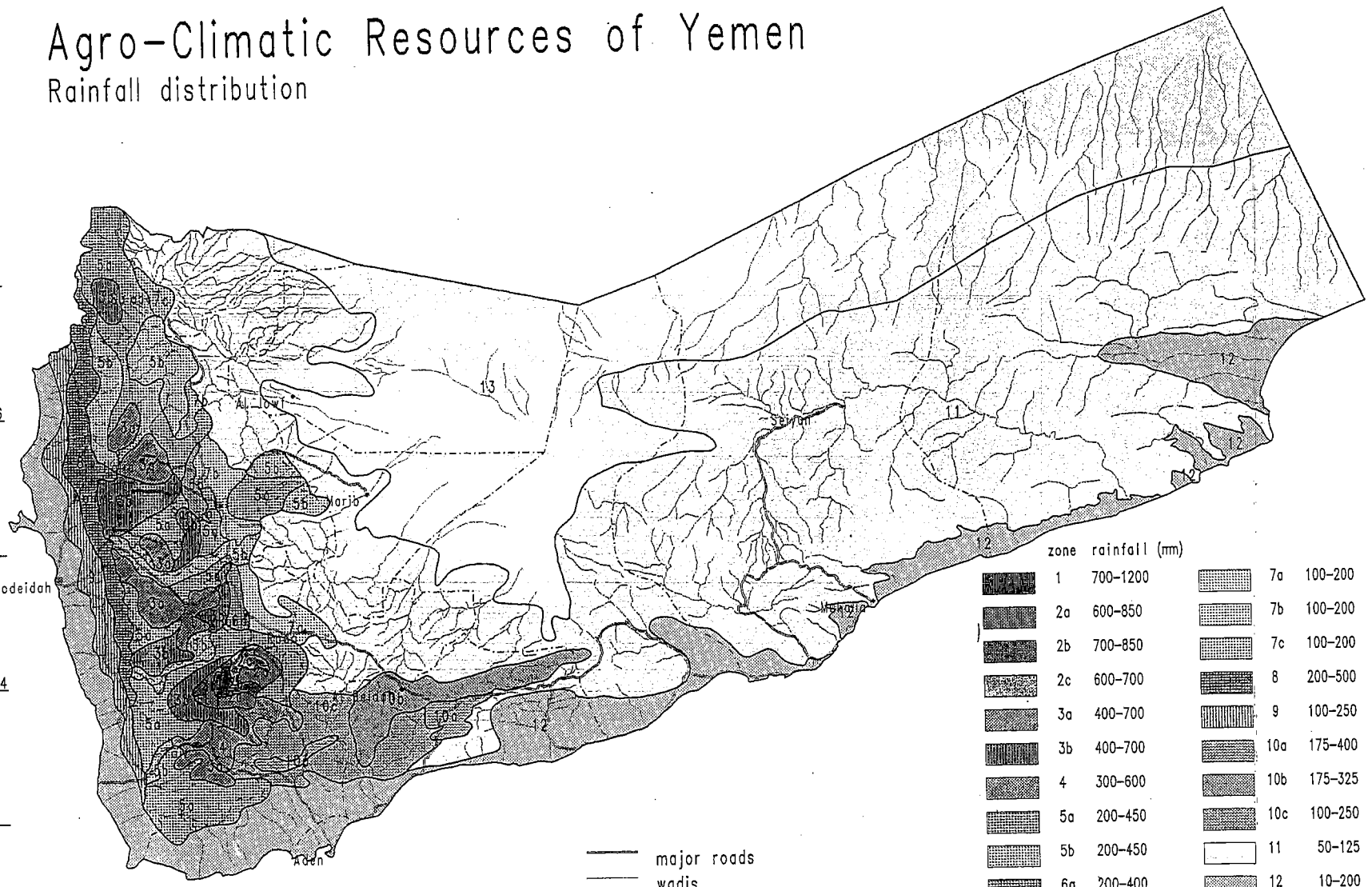
Estimates of the reference evapotranspiration (ETO) have been calculated according the the Penman-Monteith method (FAO, 1990). It is the rate of evapotranspiration from an extensive surface of 8 to 15 cm tall green grass cover, actively growing and not short of water. For the calculation mean monthly values of the climatic parameters have been used. For the potential evapotranspiration (PET) as used in the determination of the Length of Growing Period the rate of evapotranspiration of sorghum or maize during the period of full crop development and not short of water has been selected. The PET for sorghum/maize during the period of full crop development is comparable to the ETO.

The PET is a function of the following climatic and location parameters:

- climatic parameters: temperatures (minimum, maximum and average), windspeed, sunshine or solar radiation and relative humidity;
- location parameters: altitude and latitude (which influence the radiation, temperature and maximum sunshine duration).

Agro-Climatic Resources of Yemen

Rainfall distribution



zone	rainfall (mm)	zone	rainfall (mm)
1	700–1200	7a	100–200
2a	600–850	7b	100–200
2b	700–850	7c	100–200
2c	600–700	8	200–500
3a	400–700	9	100–250
3b	400–700	10a	175–400
4	300–600	10b	175–325
5a	200–450	10c	100–250
5b	200–450	11	50–125
6a	200–400	12	10–200
6b	200–400	13	0–100
		14	50–200

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mapscale 1:3.5 million

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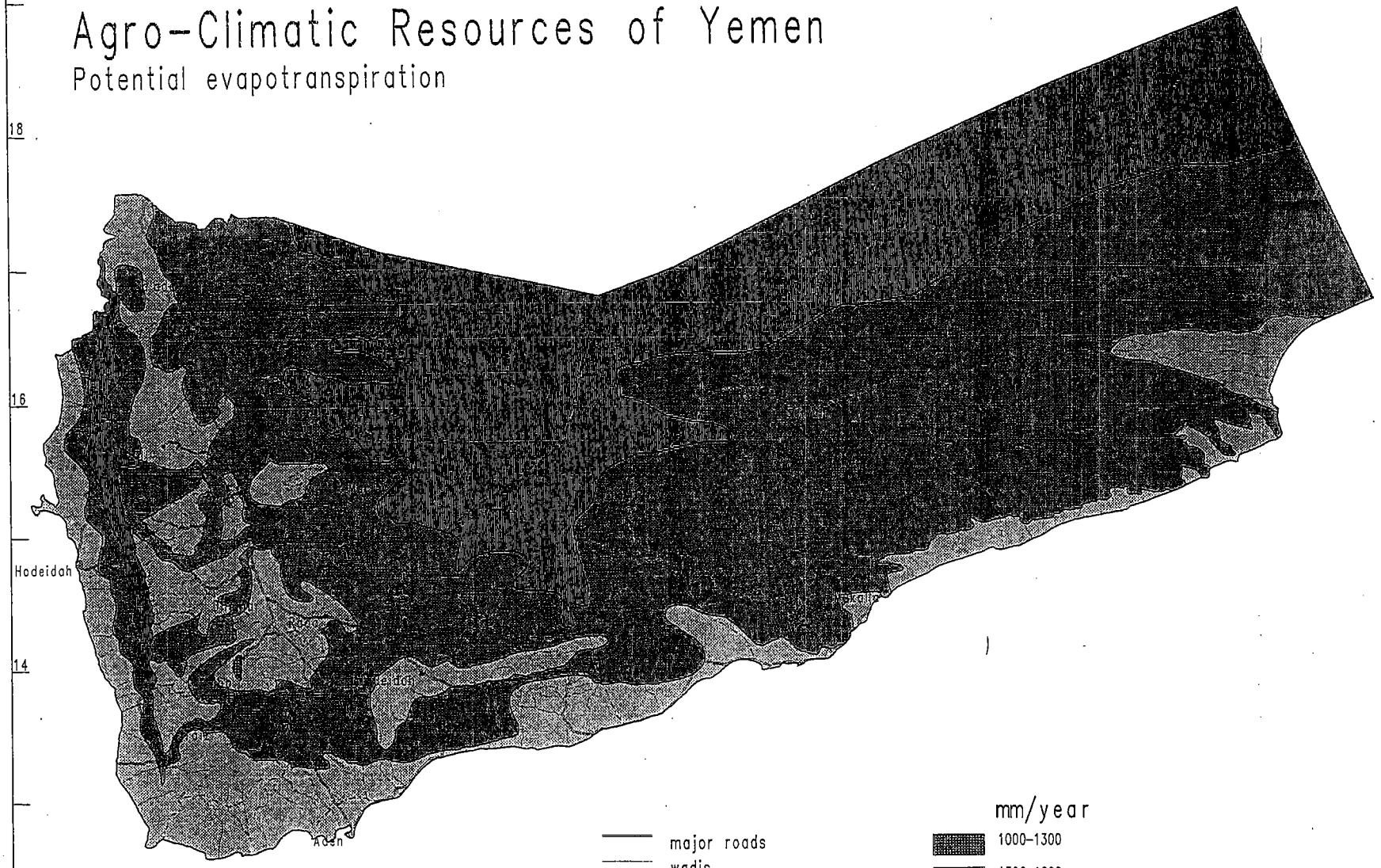
Potential evapotranspiration



major roads
wadis
governorate boundary
limit of study area
major towns

mm/year
1000–1300
1300–1600
1600–1900
1900–2200

mapscale 1:3.5 million

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As most of the above mentioned climatic parameters are only recorded in the (agro-)meteorological stations, values have been extrapolated for the rainfall stations taking into account altitude, latitude and climatic zone in which the stations are located. However, local topographic features can affect these values and therefore spatial variation may be considerable.

The variation of PET during the year follows the cyclic variation of temperature, with maxima during early summer. The annual PET (Map 3) ranges from less than 1200 mm (Ibb) to around 2000 mm (Al Jowf), while daily values vary between 2.9-3.7 mm/day for Ibb and 3.6-7.8 mm/day for Al Jowf.

The potential evapotranspiration greatly exceeds the average rainfall. Because soil water is usually severely lacking during the greater part of the year, the actual evapotranspiration is only a minor fraction of the potential evapotranspiration.

2.4 Growing period

The growing period defines the period of the year when both moisture and temperature conditions are suitable for crop production under rainfed conditions. In Yemen with rainfall during spring and summer, temperatures are not limiting crop production in those periods with sufficient moisture for crop growth under rainfed conditions.

The Length of Growing Period (LGP) is defined as the period during the year when prevailing temperatures are conducive to crop growth (Tmean $\geq$ 5°C) and precipitation plus moisture stored in the soil profile exceed half the potential evapotranspiration (PET). For the start of the growing period sufficient moisture should be accumulated in the soil profile to permit seed germination.

The estimation of the growing period is based on a water balance model which compares rainfall (P) with potential evapotranspiration (PET). If the growing period is not limited by temperature, the P/PET ratio determines the start, end and type of growing period. Four types of growing period can be differentiated in Yemen:

Normal growing period

P exceeds PET for part of the year. The ratio P/PET for the duration of the growing period generally exceeds 0.7. During part of the growing period water is stored in the soil profile, which can be used at the end of the rainy season or during a dry interval to lengthen the growing period.

Intermediate growing period

P does not normall exceed PET, but exceeds 0.5 PET for part of the year. The ratio P/PET for the duration of the growing period generally exceeds 0.5. In Yemen, where short dry spells during the rainy seasons are frequent, a P/PET ratio during the growing period of 0.45 for an average year still classifies the growing period as intermediate.

Marginal growing period

P exceeds 0.5 PET during short periods of the year. During the growing period frequent short dry spells occur. The P/PET ratio during the growing period exceeds 0.3.

No growing period

P normally does not exceed 0.5 PET during the year.

Water harvesting as practiced in Yemen enables the farmers to supplement the amount of rainfall with runoff water collected from uncultivated areas (see 2.9, Water harvesting). The modified ratio rainfall plus runoff water (P+W) over the potential evapotranspiration (PET) often nearly doubles, transforming intermediate growing periods into normal growing periods and marginal growing periods into intermediate growing periods.

The growing periods are reliable when they develop every year around the same period. The farmers can rely on the growing period to plant their crops. It does not imply that the growing period should be every year of the same duration or of the same type. A growing period is unreliable when in some years the growing period does not develop at all, or when the occurrance of the growing period varies considerably over the seasons.

In Yemen where the rainfall does not follow a unimodal pattern, a large area has two rather short growing periods per year, separated by a dry interval (P/PET<0.4) lasting from less than than one month (2 decads) to over two months (7 decads). Farmers use different cultivation practices to exploit these growing periods optimally.

Maps 4a and 4b show the distribution of the growing periods over the country without and with taking water harvesting practices into account. Map 4c displays the annual P/PET ratio, while Map 4d displays the P/PET ratio during the growing period.

The LGP analysis is based on historic data for individual years. For the northern and western part of the country use has been made of 10-day period (decad) rainfall, while for the southern and eastern of the country monthly rainfall has been used. However, for most stations the records are limited to a few years. For those stations having records over 10 years or more, the inter-annual variations in rainfall distribution have been assessed and are described in detail in part 2 'Climatic database' of this report.

2.5 Temperatures

Average temperatures are dominantly controlled by elevation. There is an approximate linear relation, with an average temperature gradient of about 0.65°C per 100 meters difference in elevation. At the lower altitudes (below 500 m) in the coastal areas, this relationship is disturbed by the proximity of the sea which has a moderating effect. Map 5a shows the annual mean

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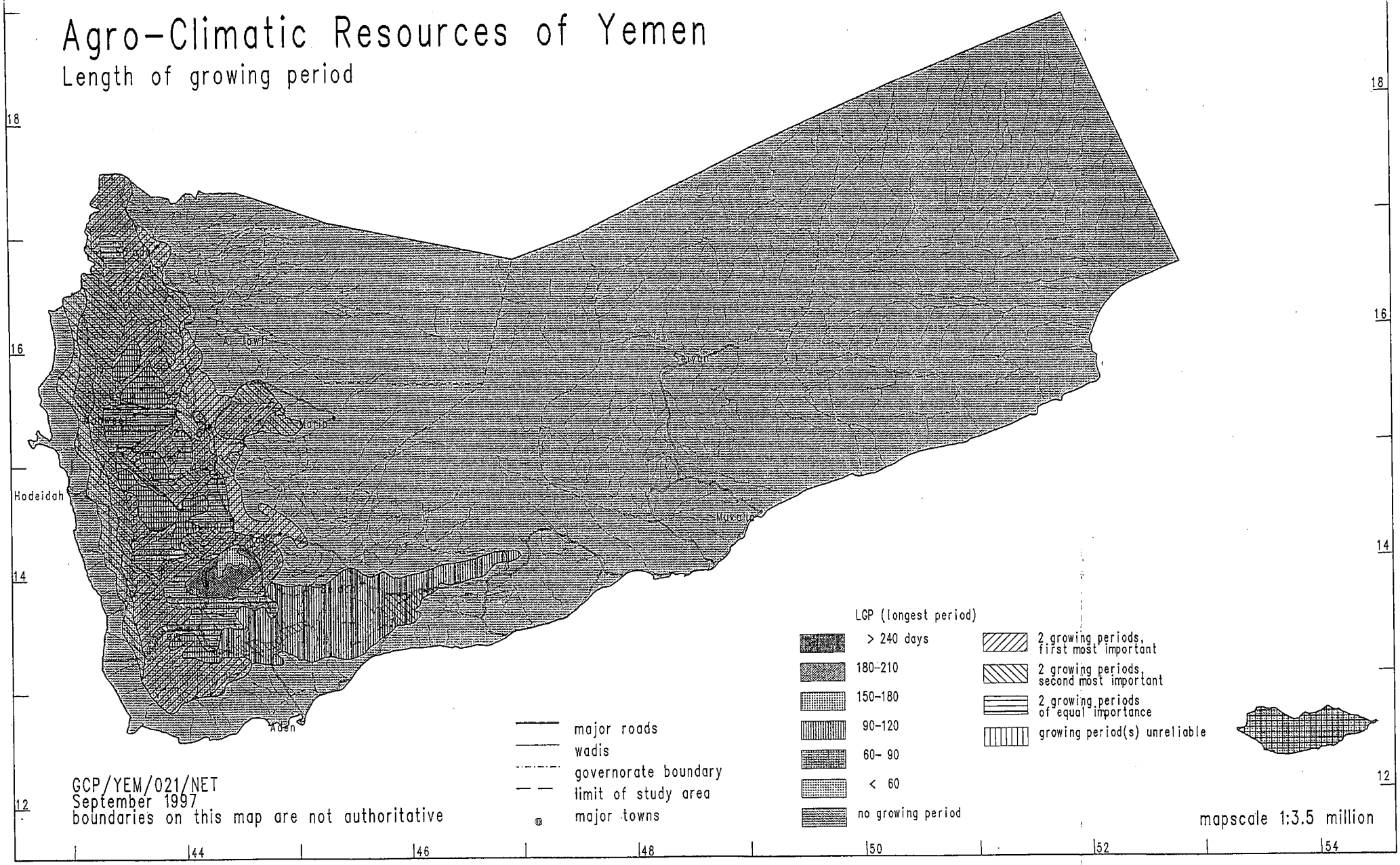
Length of growing period



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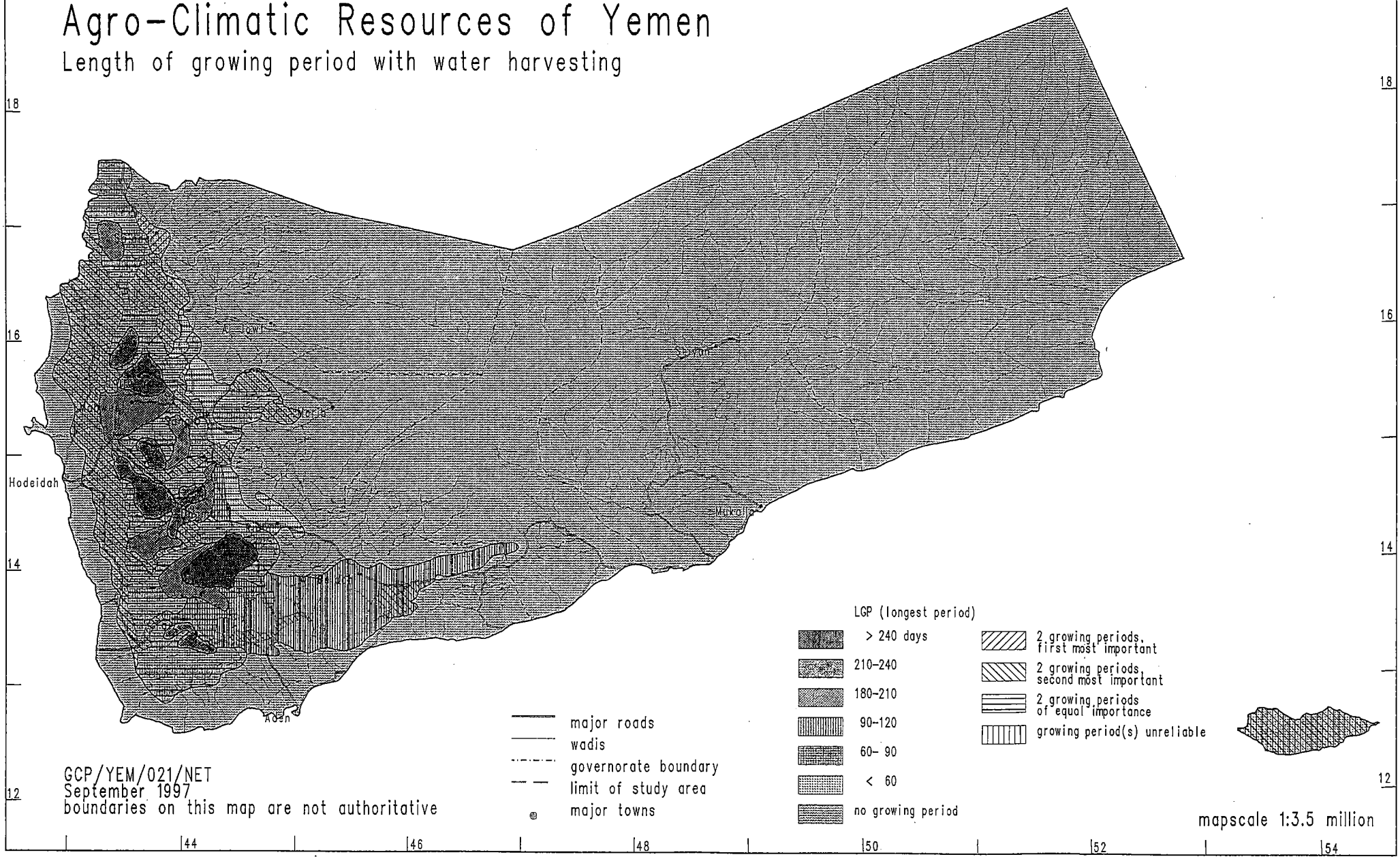
Length of growing period with water harvesting



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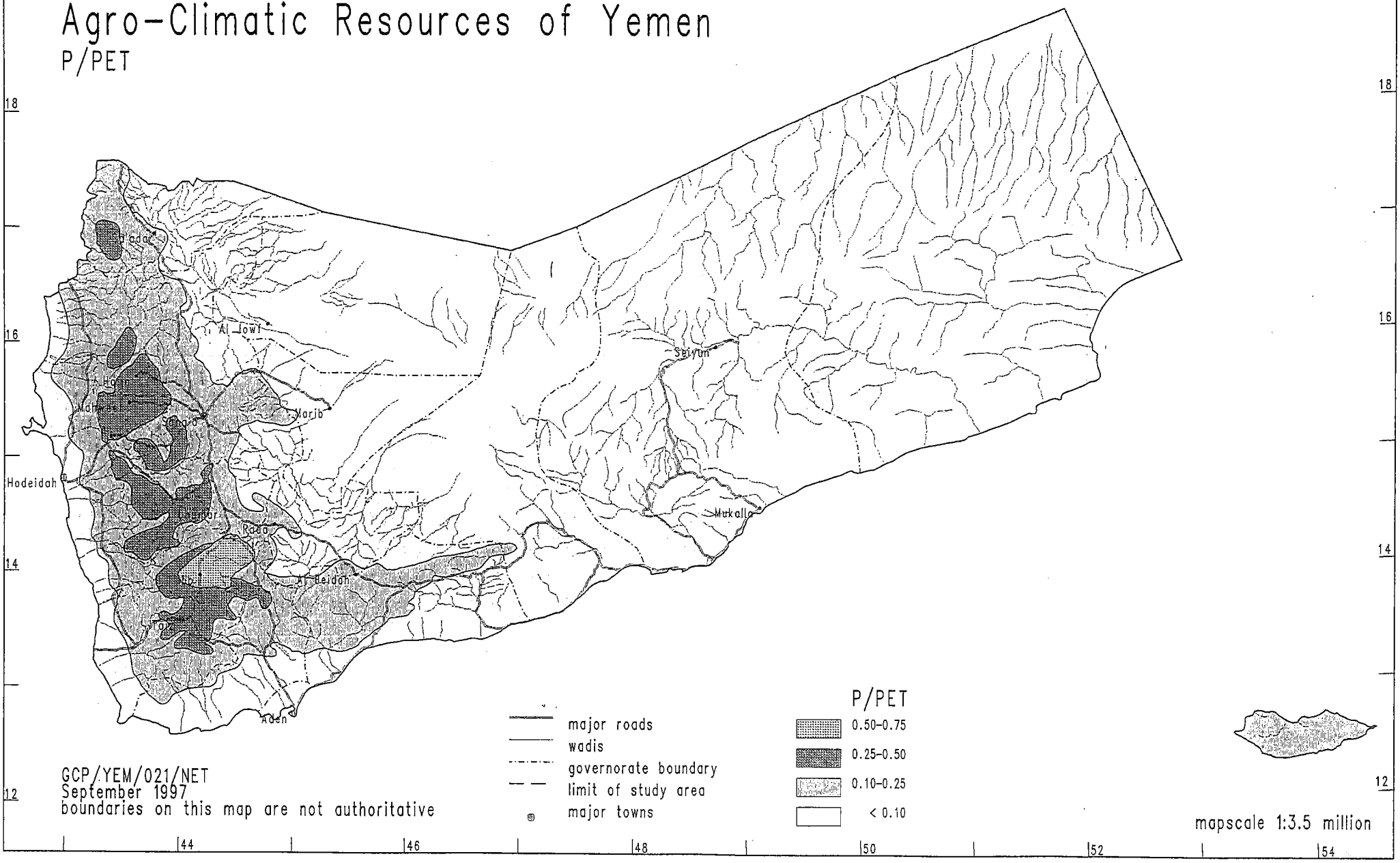
P/PET



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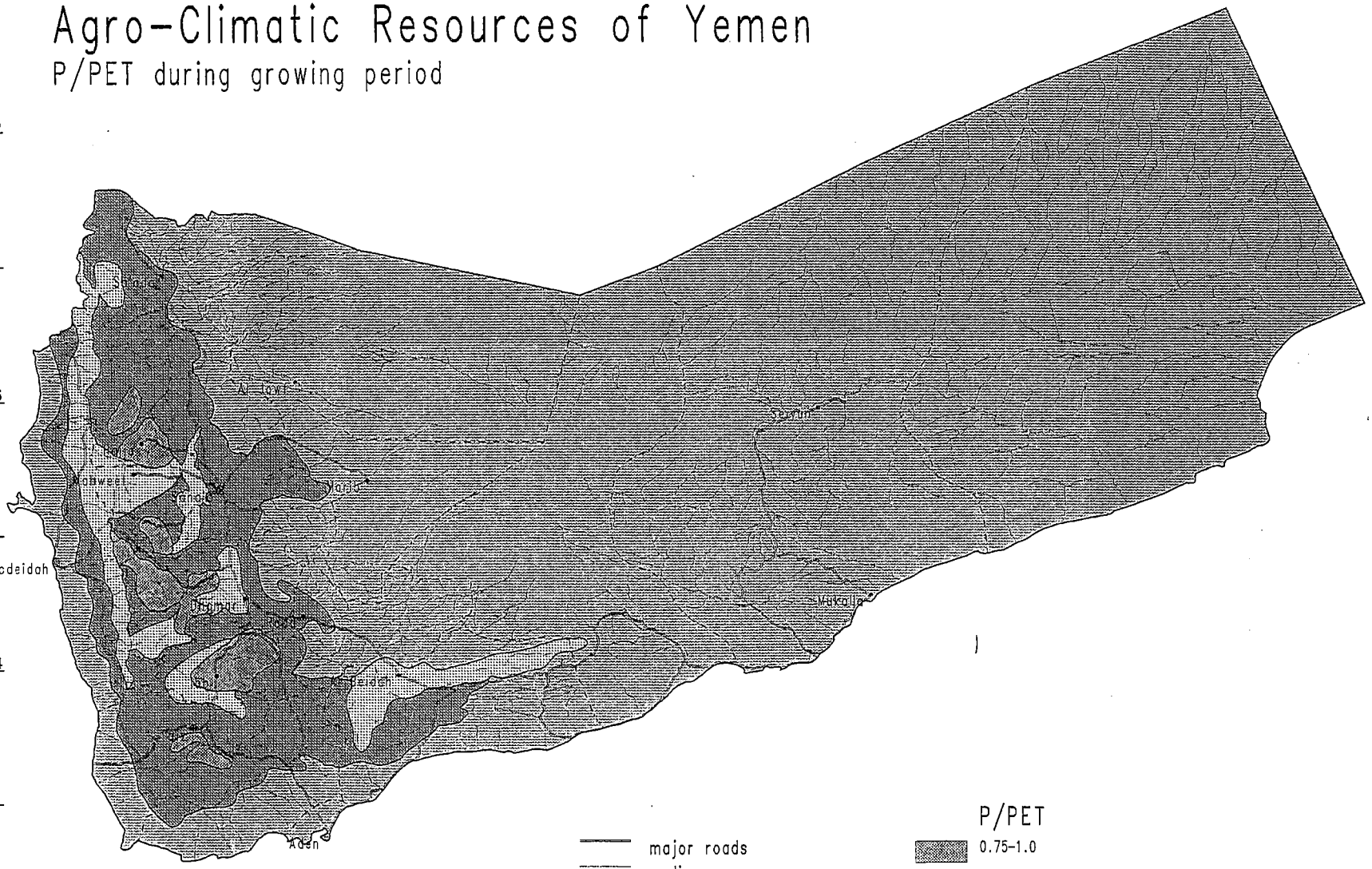
P/PET during growing period



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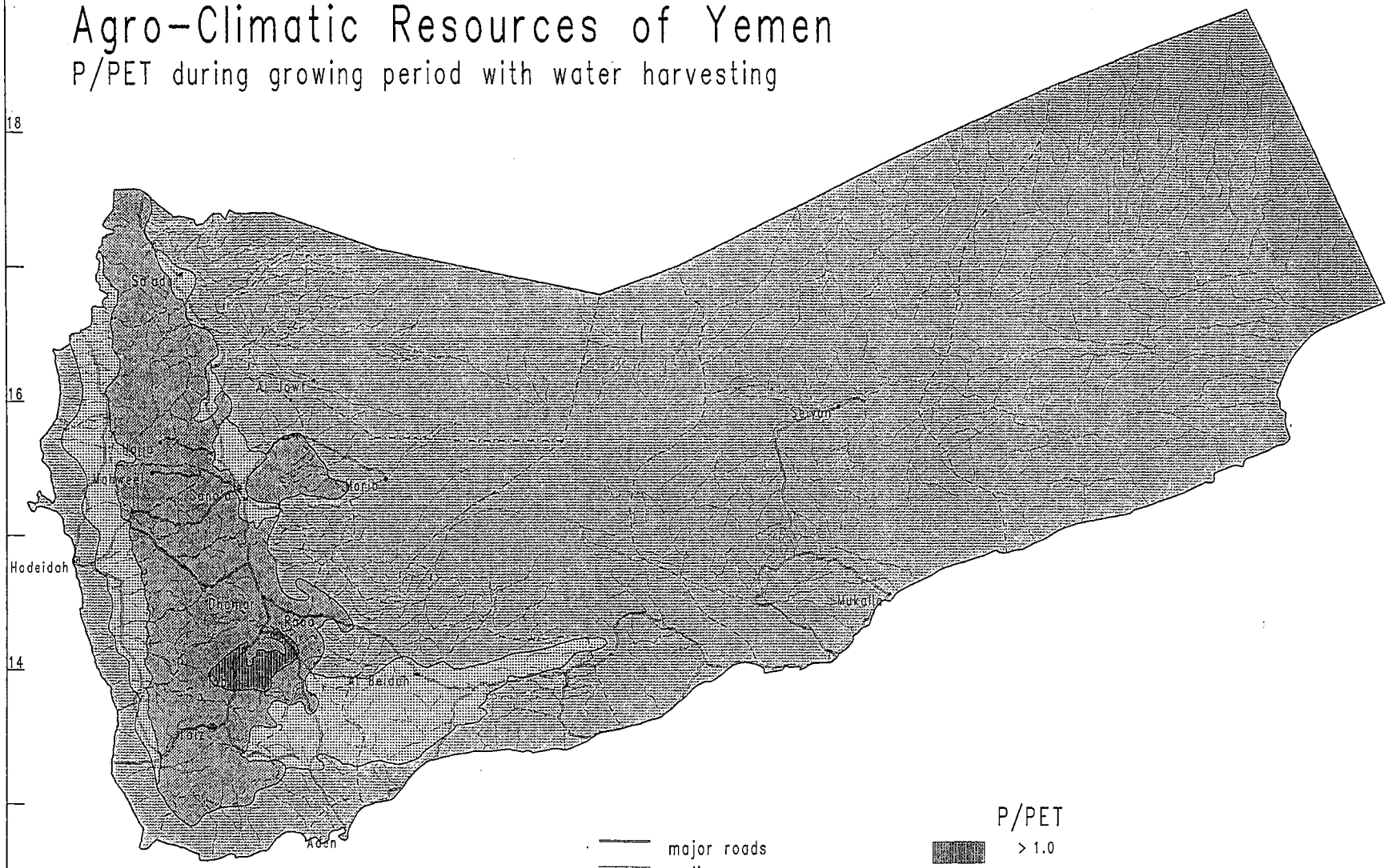
P/PET during growing period with water harvesting



major roads
wadis
governorate boundary
limit of study area
major towns

P/PET
> 1.0
0.75–1.0
0.50–0.75
no growing period

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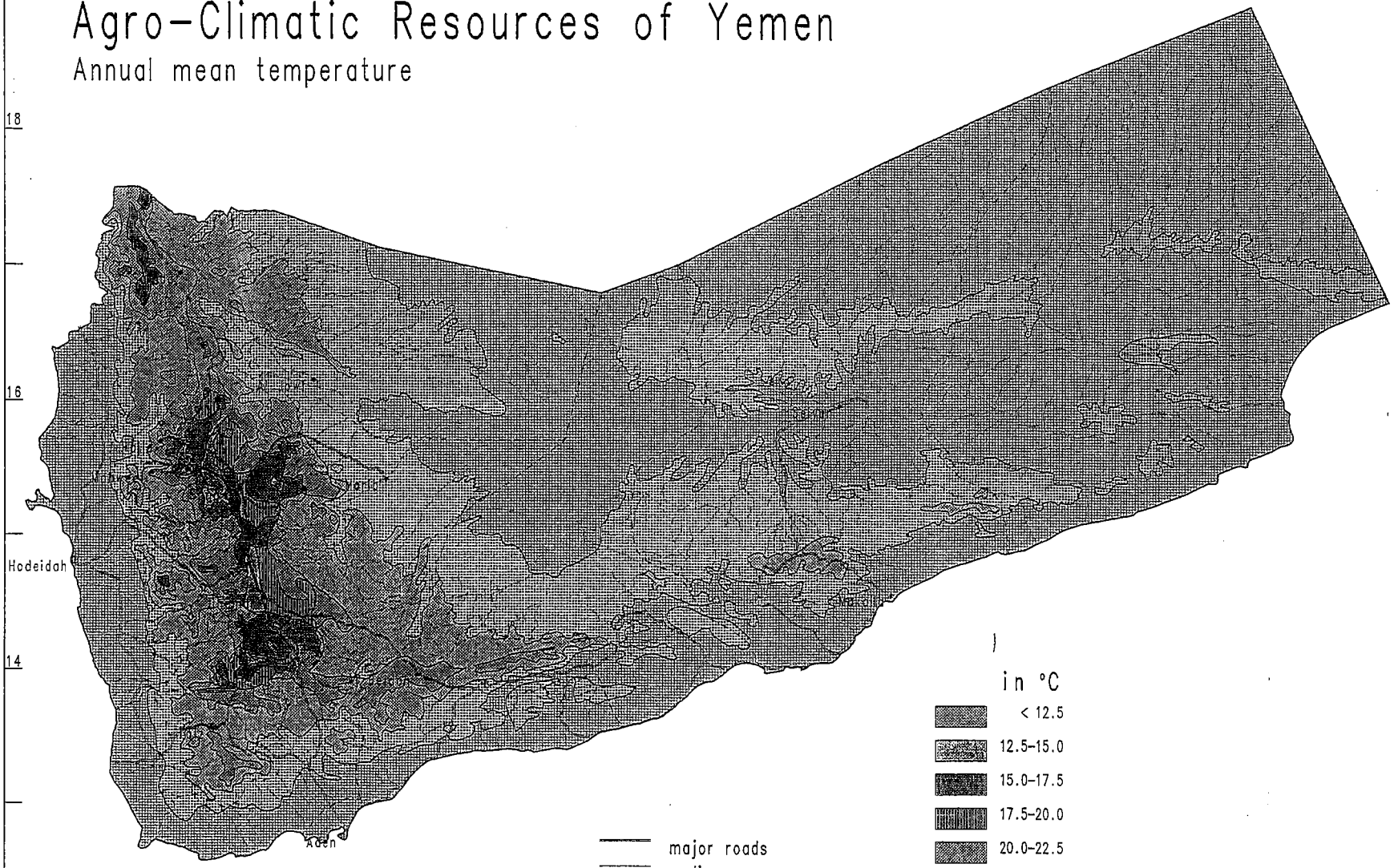
Annual mean temperature



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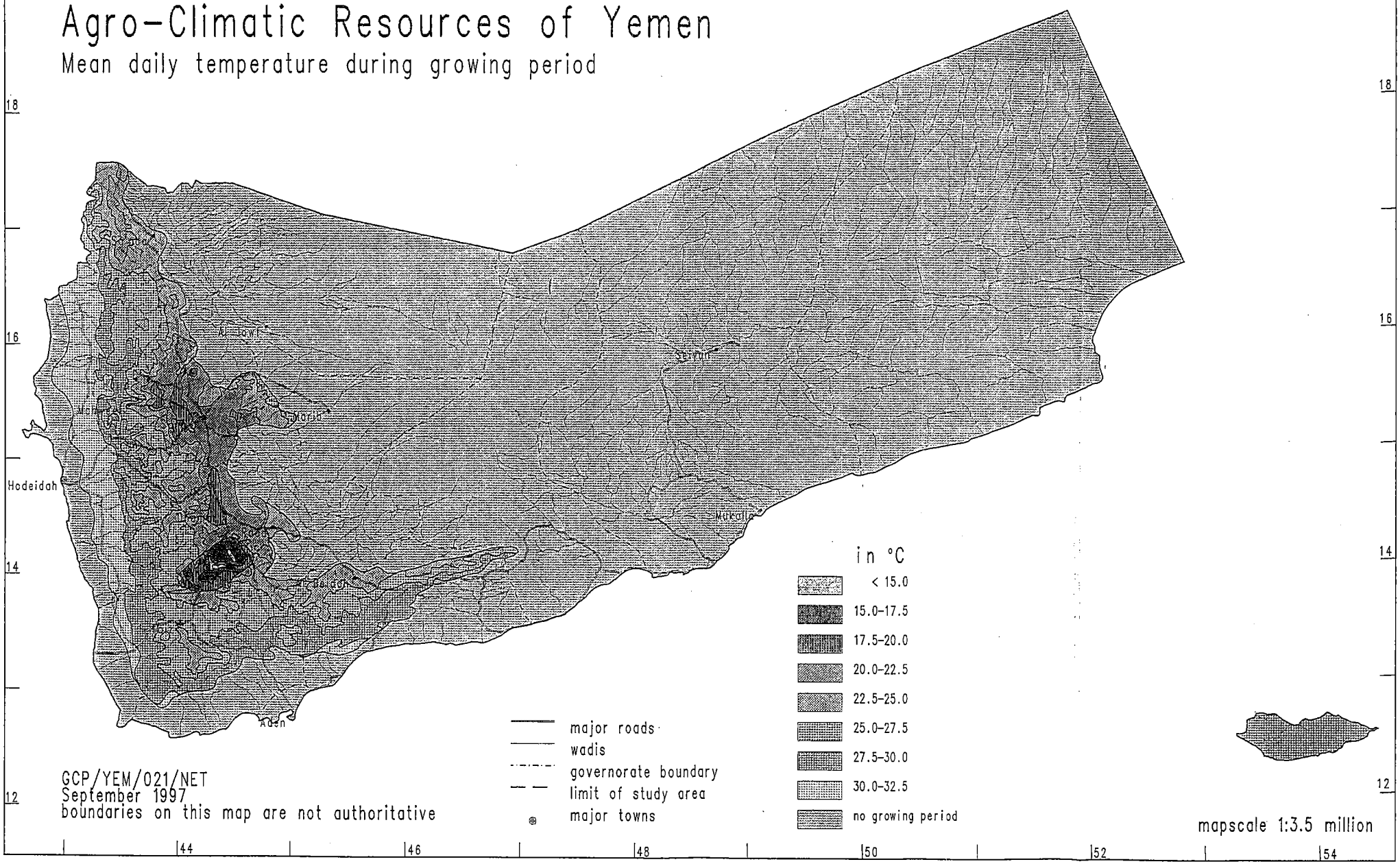
Mean daily temperature during growing period



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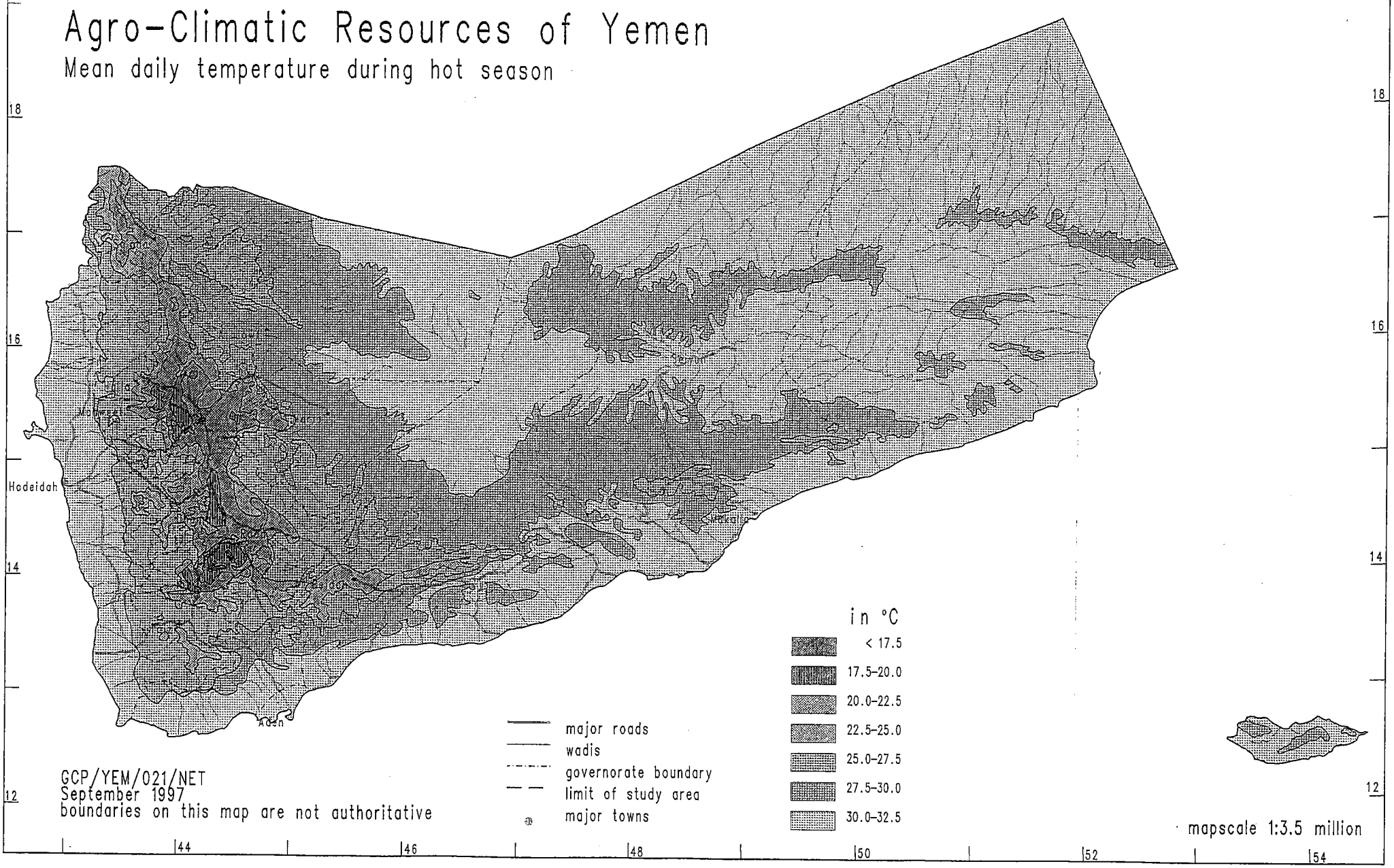
Mean daily temperature during hot season



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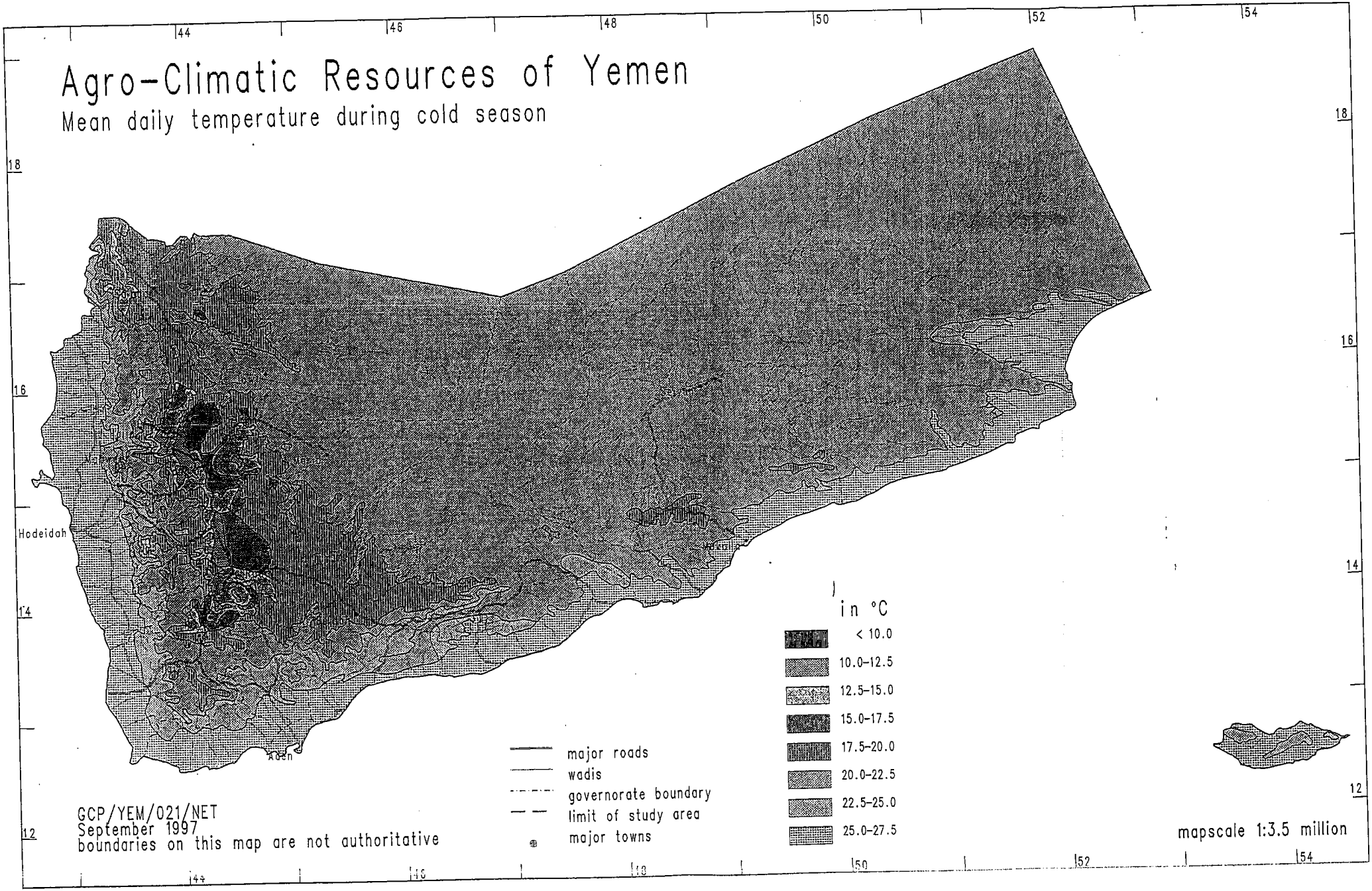
Agro-Climatic Resources of Yemen

Mean daily temperature during cold season



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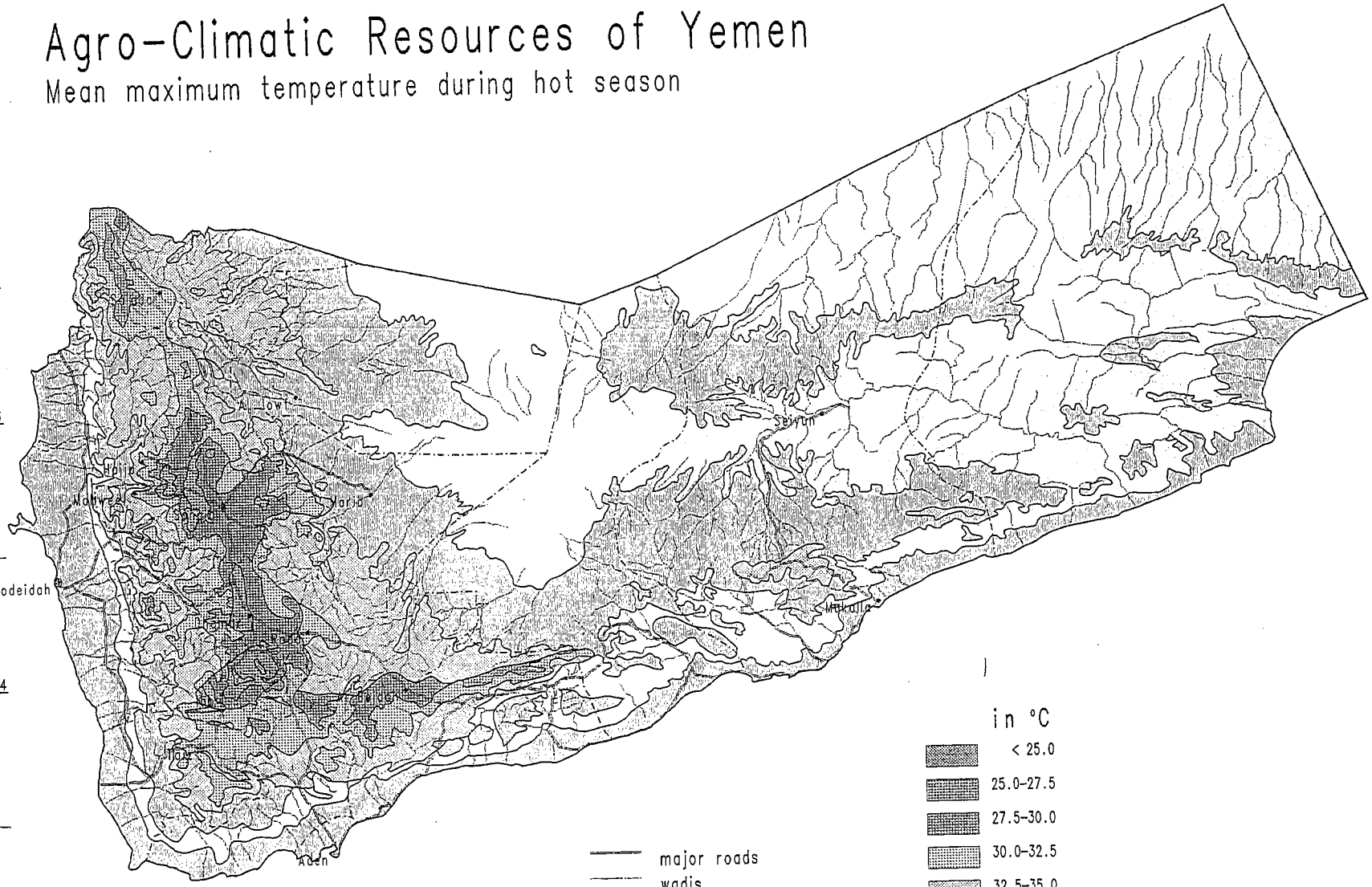
Agro-Climatic Resources of Yemen

Mean maximum temperature during hot season



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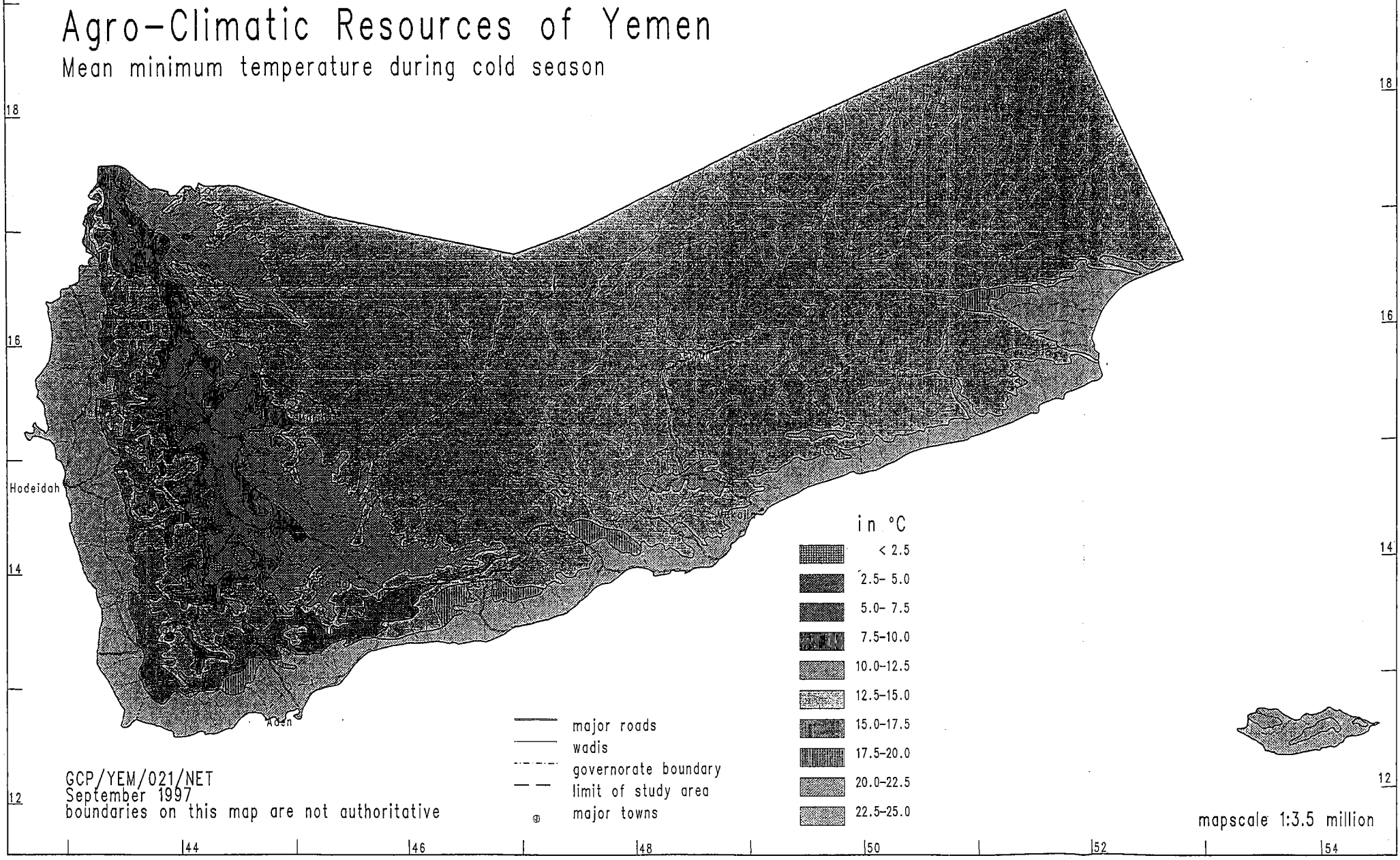
Mean minimum temperature during cold season



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temperature. Maps 5b-5d give the mean daily temperature during the growing period, hot season and cold season respectively.

The difference between the average temperatures of the warmest and the coolest month of the year is not constant over the zones. In the coastal areas and the western and southern slopes it is generally less than 10°C, but in the arid interior it increases to about 15°C. The average daily range (the difference between minimum and maximum temperature) is modest near the coast (less than 10°C), but may exceed 20°C at higher elevations and in the arid interior. Map 5e shows the mean maximum temperatures during the hot season and Map 5f shows the mean minimum temperatures during the cold season.

Above 2300 m altitude frost occurs regularly between mid October and March. Map 5g gives the distribution of the occurrence of minimum temperatures below 0°C.

2.6 Relative humidity

Relative humidity shows a strong 80 %, while a little land inward annual average values of 50 to 70 % are observed. In the mountain areas values vary between 30 and 60 %, except in the high rainfall areas where values between 50 and 70 % are observed. In the arid interior values are below 40 %.

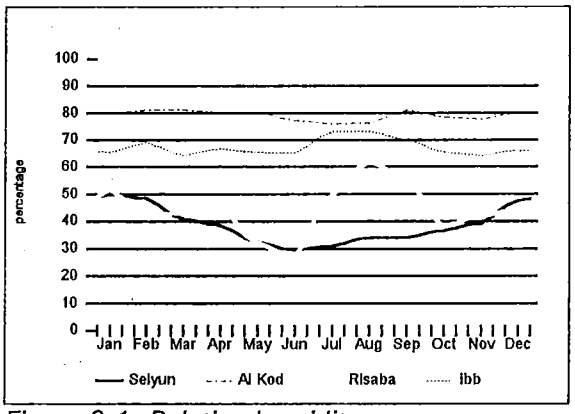


Figure 2.1: Relative humidity

The variation of the relative humidity over the year follows the rainy seasons. However, in the arid zones the relative humidity is highest during the cool season. Figure 2.1 shows the relative humidity graphs of various selected stations.

2.7 Sunshine and radiation[2]

Clear skies are predominant in Yemen during most of the year. This is reflected in the records of sunshine duration. Recorded annual average values are between 6 and 10 hours per day, which corresponds to 50 to 80 % of the theoretical maximum. Absence of sunshine during daytime is not only caused by clouds. Mountains near the side of observation may also shorten

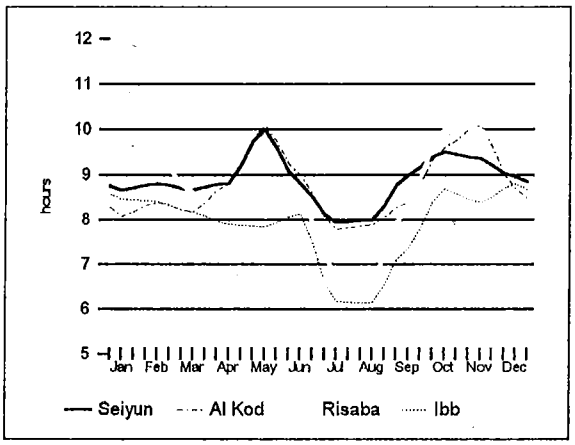


Figure 2.2: Sunshine hours

[2] derived from WRAY (1995)

sunshine duration because of the shadows they produce after sunrise and before sunset.

Figure 2.2 shows the sunshine selected stations. From month to month there is little variation in the number of sunshine hours. Generally, the number reaches a minimum during the summer rainy season.

The net solar radiation (Rns) has been calculated from daily sunshine hours or, where available from solar radiation measurements. The Rns per year is lowest in the coastal zone (below 5500 MJ/m²/year), somewhat higher in the high rainfall areas (5200-6000 MJ/m²/year) and in the dry interior (5500-6000 MJ/m²/year), and highest (6000-6500 MJ/m²/year) in the mountain area and intermontane plains. Map gives the annual Rns, while Maps 6b and 6c show the daily Rns during the growing period and the cold season respectively.

2.8 Windspeed (Figure 2.3)

Average windspeed in most of Yemen is low to moderate (less than 1 to 2 m/sec), except on the coast and at well-exposed locations in the mountain zones (2 to 2.5 m/sec). It is believed that a significant part of the differences has to be attributed to local effects.

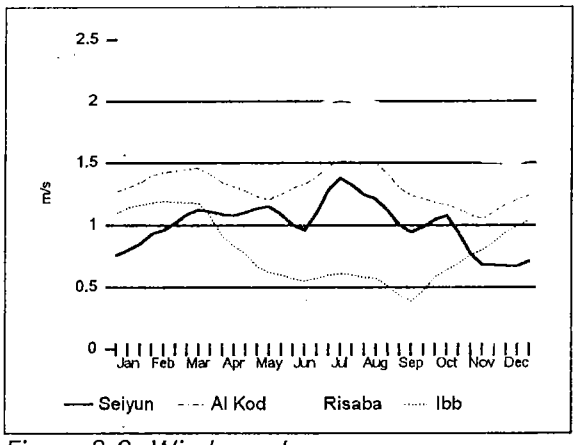


Figure 2.3: Windspeed

2.9 Water harvesting

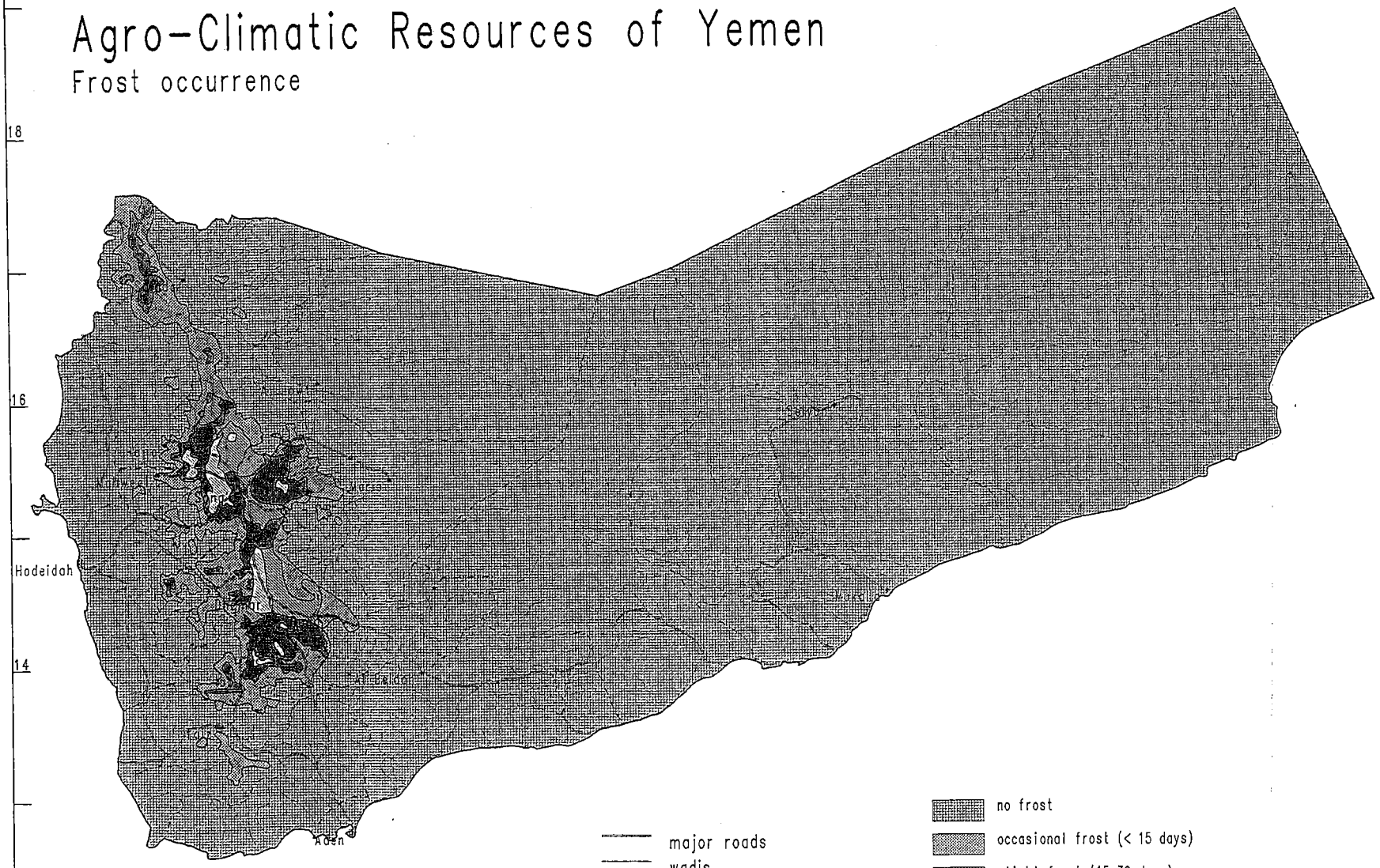
As only a limited area in Yemen (about 2300 km²) receives sufficient rainfall to support crop growth, most farmers need to increase the amount of water in order to grow a decent crop. Farmers in Yemen have adopted several cultural practices to augment the amount of water coming to their fields. Those methods that rely on direct rainfall are called water harvesting. Irrigation is not considered as water harvesting.

In sloping areas the runoff water from those tracts of land that are not cultivated is collected and conveyed to the cultivated fields. The cultivated fields are established on terraced land; the land has been levelled by the construction of bench terraces. The fields are ridged and the terrace wall contains a ridge to enable the water to accumulate on the terrace and to infiltrate into the soil. When the terrace is covered by water, the supplementary water is conveyed to a lower terrace.

In less sloping areas fields are left uncultivated and the surface permeability of those fields is reduced. The infiltration of the rainfall is hampered and the runoff water is guided to adjoining fields under cultivation. The assumption has been

Agro-Climatic Resources of Yemen

Frost occurrence



major roads
wadis
governorate boundary
limit of study area
major towns

no frost
occasional frost (< 15 days)
slight frost (15–30 days)
moderate frost (30–45 days)
severe frost (> 45 days)

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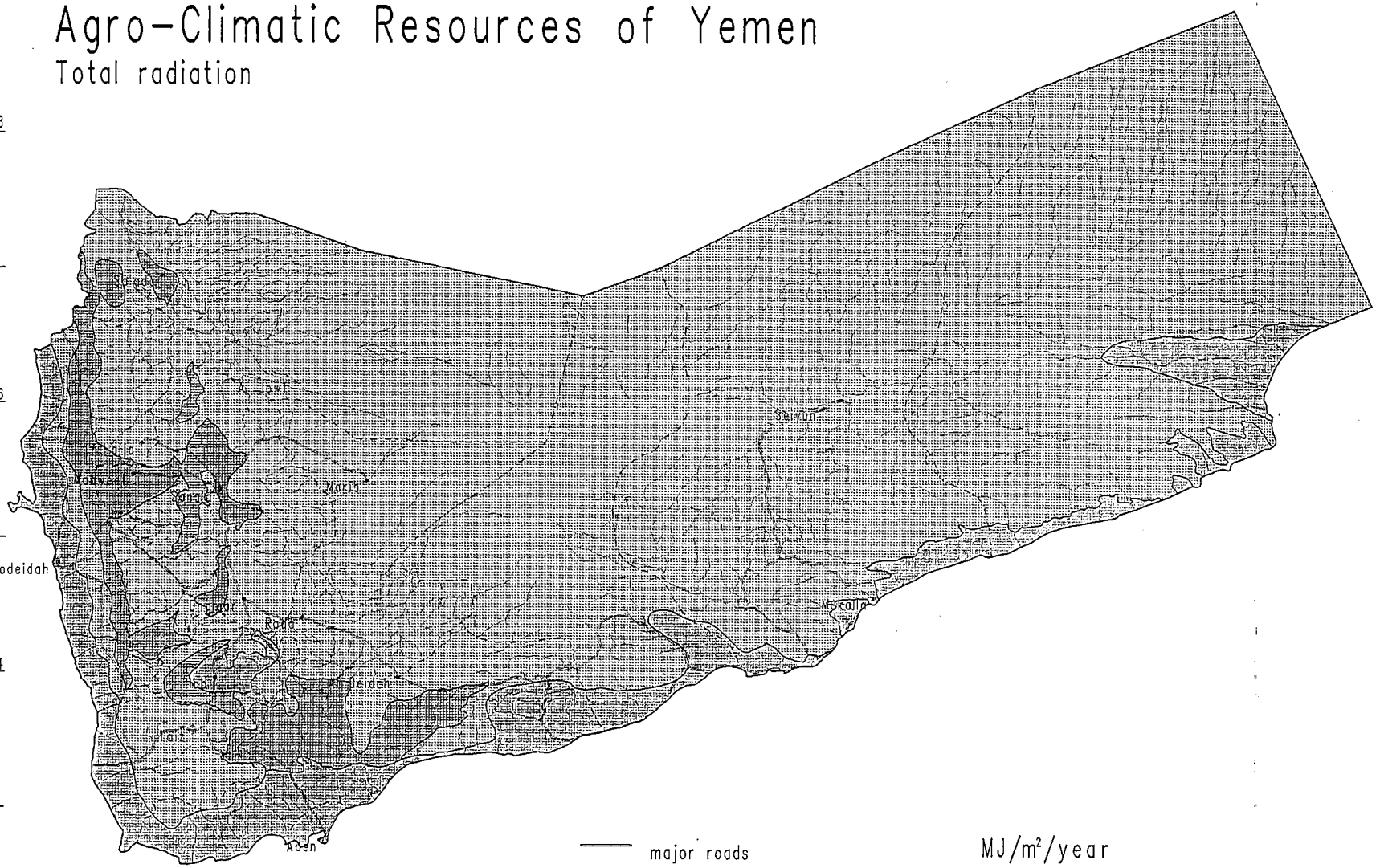
Total radiation



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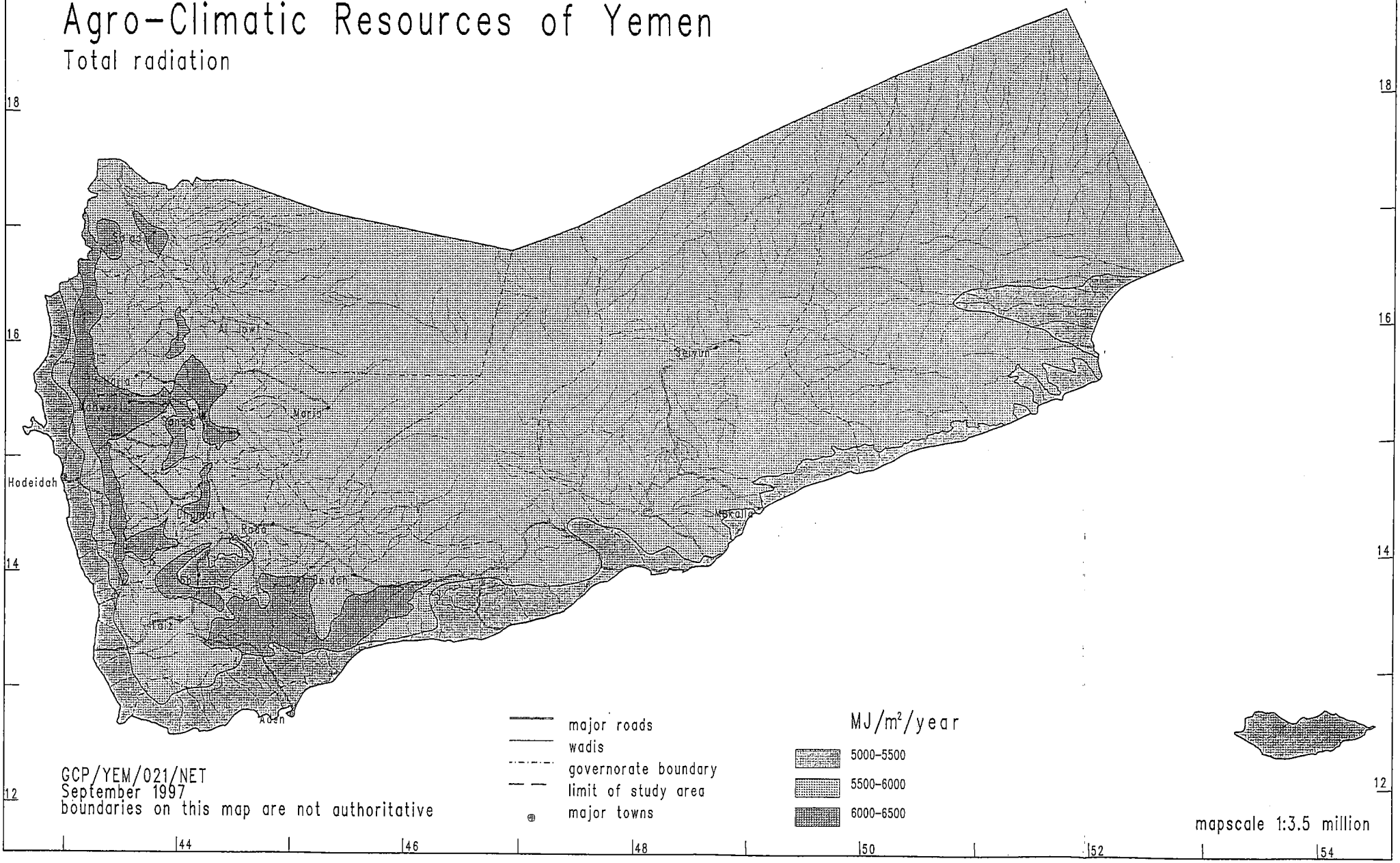
Agro-Climatic Resources of Yemen

Total radiation



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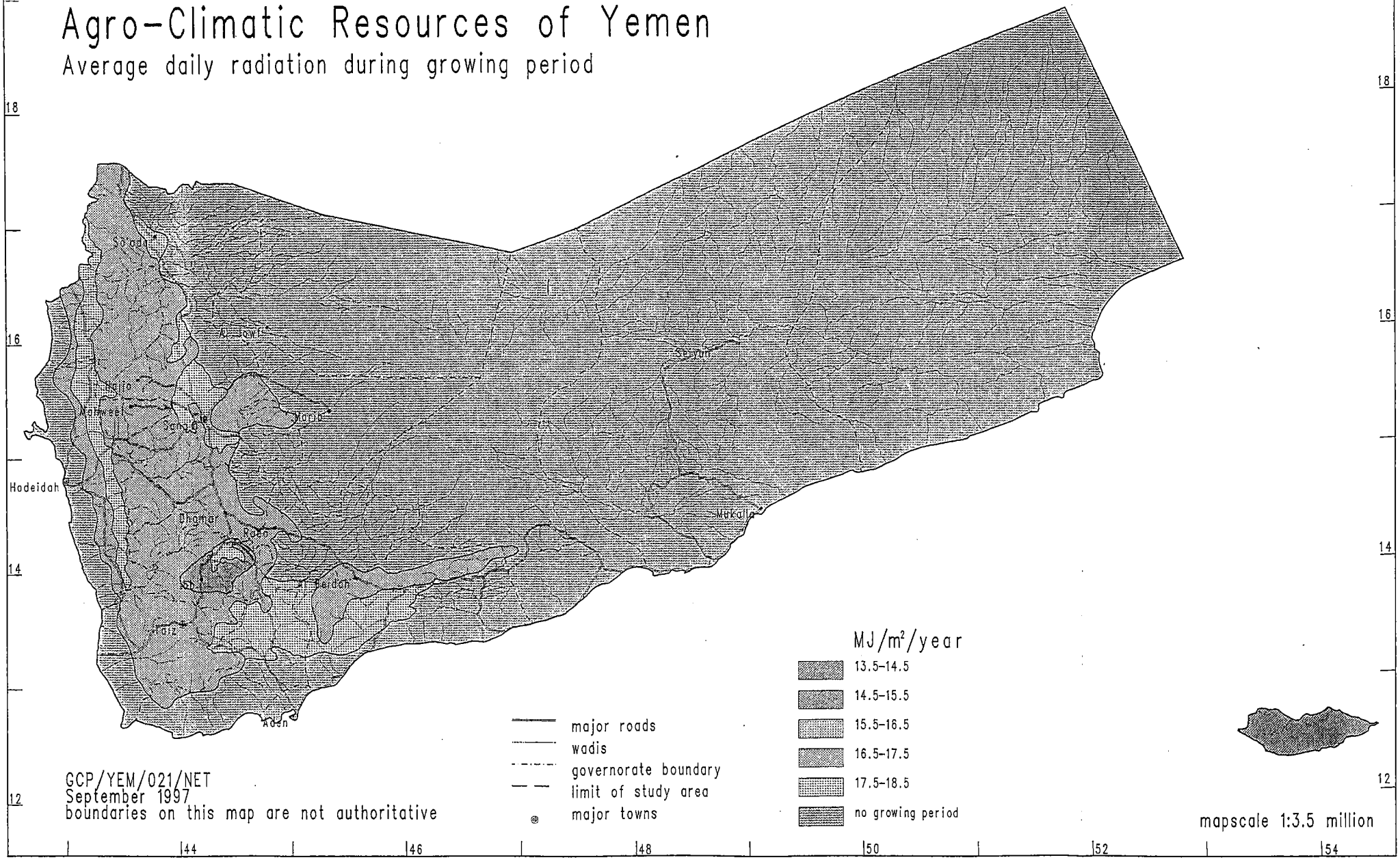
Agro-Climatic Resources of Yemen

Average daily radiation during growing period



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mapscale 1:3.5 million

made that the daily rainfall amount should exceed 10 mm before water will runoff.

The amount of runoff water available for water harvesting varies from area to area, and depends largely of the area not under cultivation. To make an estimation of the amount of water available to the plants, the terrace factor is introduced. When the runoff water collected on a field equals the rainfall amount, the terrace factor equals 1; when the runoff water collected on a field is double the rainfall amount, the terrace factor equals 2. This does not imply that all the water becomes available to the plants. A terrace can store about 100 mm of water between the ridges, and additional water runs off. When the soil profile is saturated with water (for the deep terrace soils the storage amount is assumed to be 200 mm), additional water will permeate to deep layers and is lost for the plants.

2.10 Soil temperature regime

The term soil temperature regime refers to the fluctuation of the soil temperature at a depth of 50 cm over the year. At 50 cm depth the influence of the daily air temperature variations is minimized, and only seasonal variations are influencing the soil temperature.

However, recordings of the soil temperature at 50 cm depth in Yemen are uncommon. If the soil temperature is recorded it is mostly at a depth of 20 cm. From the limited data available, it can be assumed that the monthly soil temperature at 50 cm depth is between the monthly mean air temperature and the monthly maximum air temperature when the soil is dry, while it is closer to the monthly mean air temperature when the soil is wet.

The Soil Taxonomy (1994) differentiates 10 soil temperature regimes of which the following occur in Yemen:

- **Thermic**

  The mean annual soil temperature is 15°C or higher but lower than 22°C, and the difference between mean summer and mean winter soil temperatures is more than 5°C.

- **Isothermic**

  The mean annual soil temperature is between 15 and 22°C, and the mean summer and winter temperature differ by less than 5°C.

- **Hyperthermic**

  The mean annual soil temperature is 22°C or higher, and the difference between mean summer and mean winter soil temperature is more than 5°C.

- **Isohyperthermic**

The mean annual soil temperature is 22°C or higher, and the mean summer and winter soil temperature differ by less than 5°C.

Map 7 shows the distribution of the soil temperature regimes over Yemen.

2.11 Soil moisture regime

The soil moisture regime is an important characteristic of the soil, which is reflected in the vegetation and soil development. The term soil moisture regime refers to the presence or absence of water in specific parts of the soil (called the moisture control section), by periods of the year. The upper boundary of the moisture control section is the depth to which a dry soil will be moistened by 2.5 cm of water within 24 hours, while the lower boundary is the depth to which a dry soil will be moistened by 7.5 cm of water within 48 hours.

The soil moisture regimes of the various zones have been determined by simulation of the water contribution by rainfall and water harvesting, uptake by a crop and percolation to deeper horizons for different years. The profile considered is a well drained soil, without water table and with a water retention of 200 mm of water over a depth of 100 cm.

The Soil Taxonomy (1994) differentiates 5 soil moisture regimes of which the following occur in Yemen:

- **aridic**

In the aridic moisture regime, the moisture control section is, in 6 or more out of 10 years,

1. Dry in all parts for more than half the cumulative days per year; *and*
2. Moist in some or all parts for less than 90 consecutive days.

In the aridic soil moisture regime there is little or no leaching , and soluble salts accumulate in the soil.

- **ustic**

In the ustic moisture regime, the moisture control section is, in 6 or more out of 10 years,

1. Dry in some or all parts for 90 or more cumulative days per year; *and*
2. Moist in some part for more than 180 cumulative days per year, or for 90 or more consecutive days.

In the tropical and sub-tropical regions that have a monsoon climate, the moisture regime is ustic if there is at least one rainy season of three

months or more. Moreover, the rainfall should not be concentrated during the cool period, when the evapotranspiration is at a minimum. Native plants are mostly annuals, or plants that have a dormant period while the soil is dry.

- udic

In the udic moisture regime, the moisture control section is, in 6 or more out of 10 years, not dry in any part for as long as 90 cumulative days per year.

The udic moisture regime is common to the soils of humid climates which have a well distributed rainfall, or which have enough rain in summer so that the amount of stored moisture plus rainfall is approximately equal to, or exceeds, the amount of evapotranspiration. Water moves down through the soil at some time in most years.

As the number of classes is limited, each moisture regime covers a wide range of different climatic conditions. Therefore, these soil moisture regimes have tentatively been subdivided by Van Wambeke (1982). The following sub-classes occur in Yemen:

Aridic:	extreme aridic	soil moisture section is totally dry during the whole year;
	typic aridic	soil moisture section is partially or totally wet for not more than 45 consecutive days per year;
	weak aridic	other aridic soil moisture regimes.

Ustic with an iso-type soil temperature regime:

aridic tropo-ustic	soil moisture section partially or totally wet for less than 180 cumulative days per year;
typic tropo-ustic	soil moisture section partially or totally wet between 180 and 270 cumulative days per year;
udic tropo-ustic	soil moisture section partially or totally wet for more than 270 cumulative days per year.

Ustic without an iso-type soil temperature regime:

aridic temp-ustic	soil moisture section partially or totally wet for less than 180 cumulative days per year;
typic temp-ustic	soil moisture section partially or totally wet between 180 and 270 cumulative days per year;
udic temp-ustic	soil moisture section partially or totally wet for more than 270 cumulative days per year.

Udic with a soil temperature regime -iso:

dry tropo-udic	soil moisture section partially or totally dry during more than 30 cumulative days per year

Map 8a and Map 8b show the distribution of the soil moisture regimes over Yemen without and with taking into account water harvesting practices respectively.

2.12 Agro-climatic zonation[3]

Agro-climatic zonation is an essential element of agro-ecological zonation. The purpose of zoning, as carried out for rural land-use planning, is to separate areas with similar sets of potentials and constraints for development. Specific programmes can then be formulated to provide the most effective support to each zone.

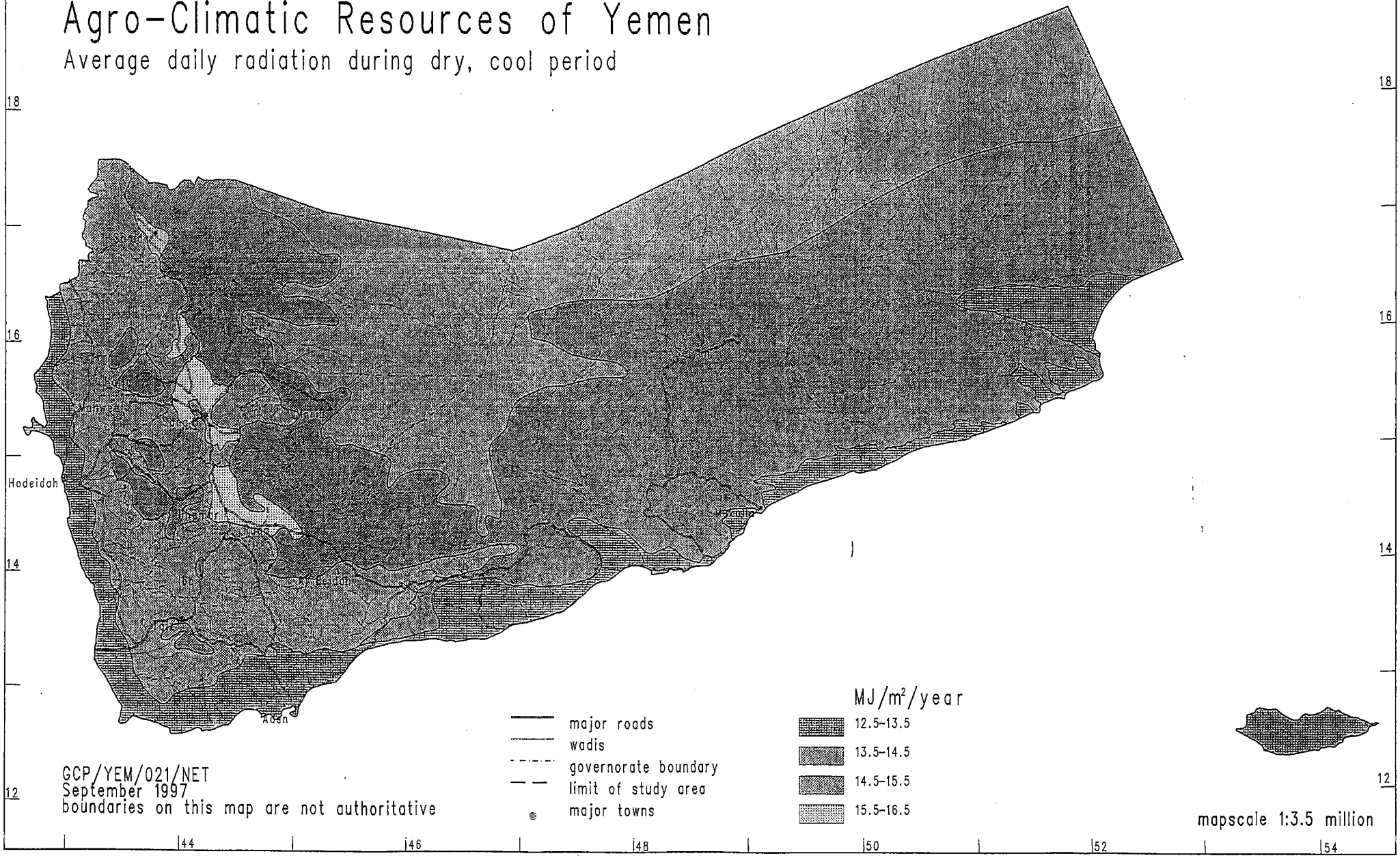
Agro-ecological zoning defines zones on the basis of combinations of soil, landform and climatic characteristics. The particular parameters used in the definition focus attention on the climatic and edaphic requirements of crops and on the management systems under which the crops are grown. Each zone has a similar combination of constraints and potential for land use, and serves as a focus for the targetting of recommendations designed to improve the existing land-use situation, either through increasing production or by limiting degradation.

Zoning divides the area into smaller units based on distribution of soil, land surface and climate. The agro-climatic zonation is the subdivision based on climatic criteria. The essential elements in defining agro-climatic zones are the growing period(s) and the temperature regime.

[3] derived from FAO (1996)

Agro-Climatic Resources of Yemen

Average daily radiation during dry, cool period



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September 1997
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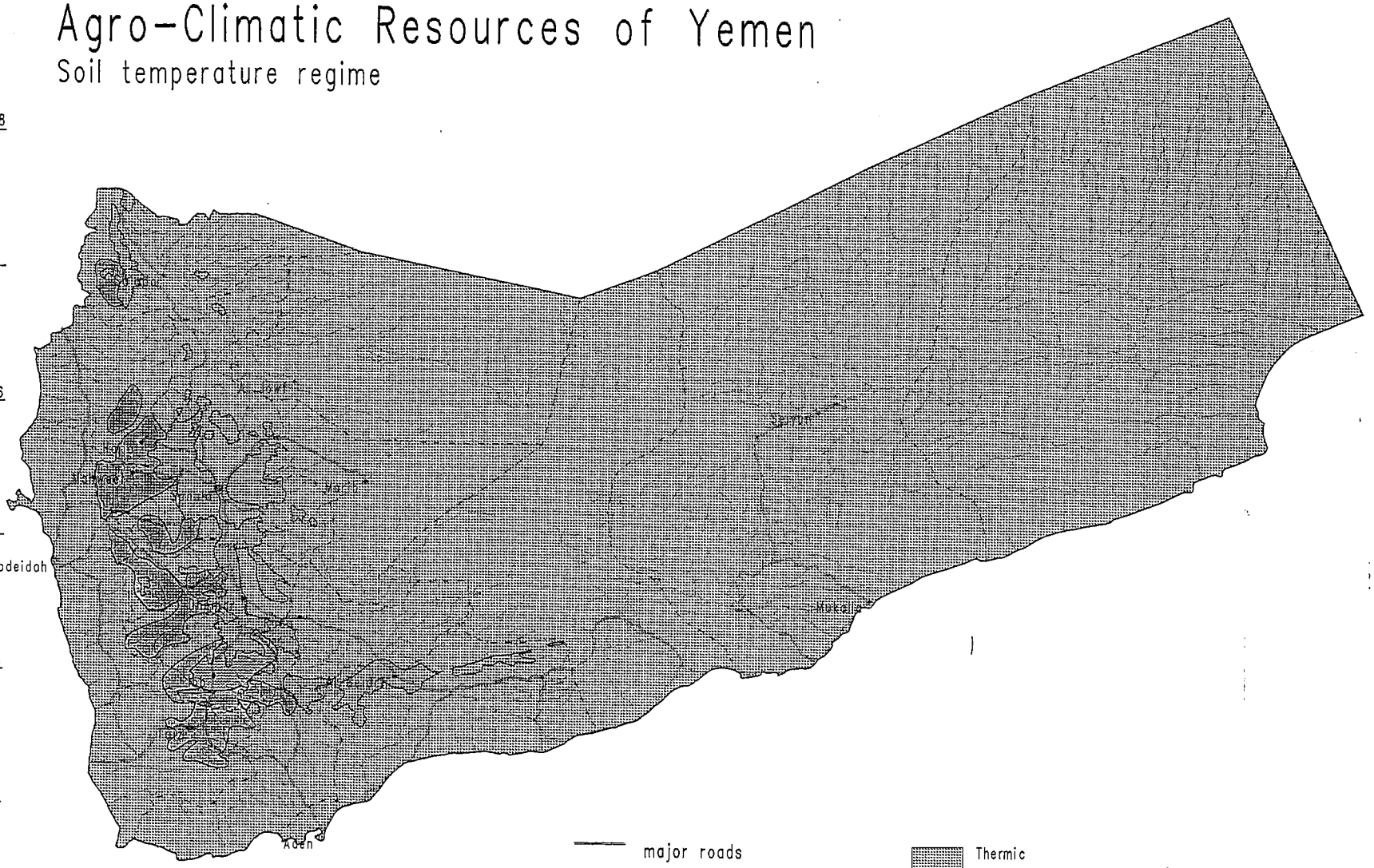
mapscale 1:3.5 million

Agro-Climatic Resources of Yemen

Soil temperature regime



major roads
wadis
governorate boundary
limit of study area
major towns

Thermic
Isothermic
Hyperthermic
Isohyperthermic

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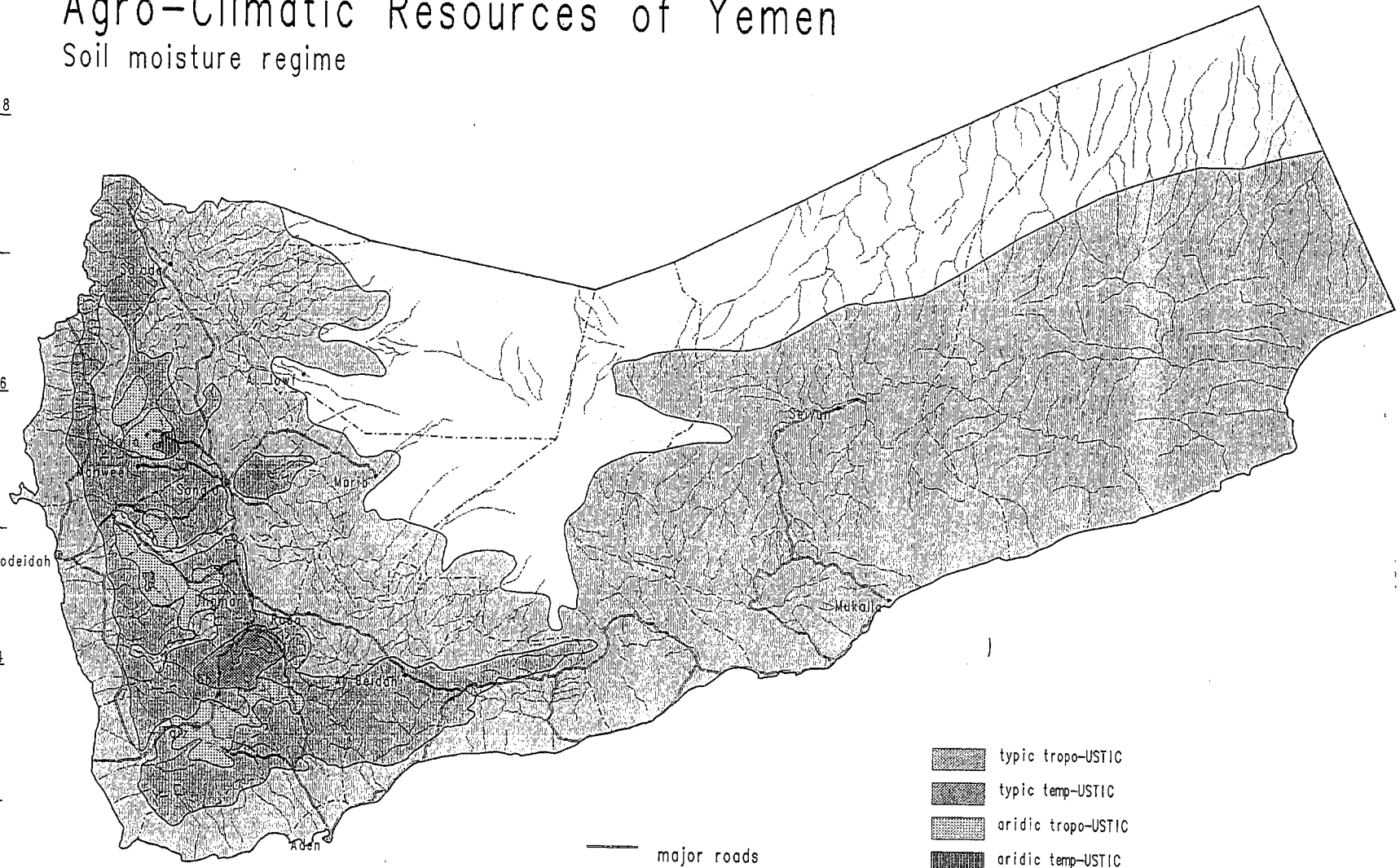
boundaries on this map are not authoritative

Agro-Climatic Resources of Yemen

Soil moisture regime



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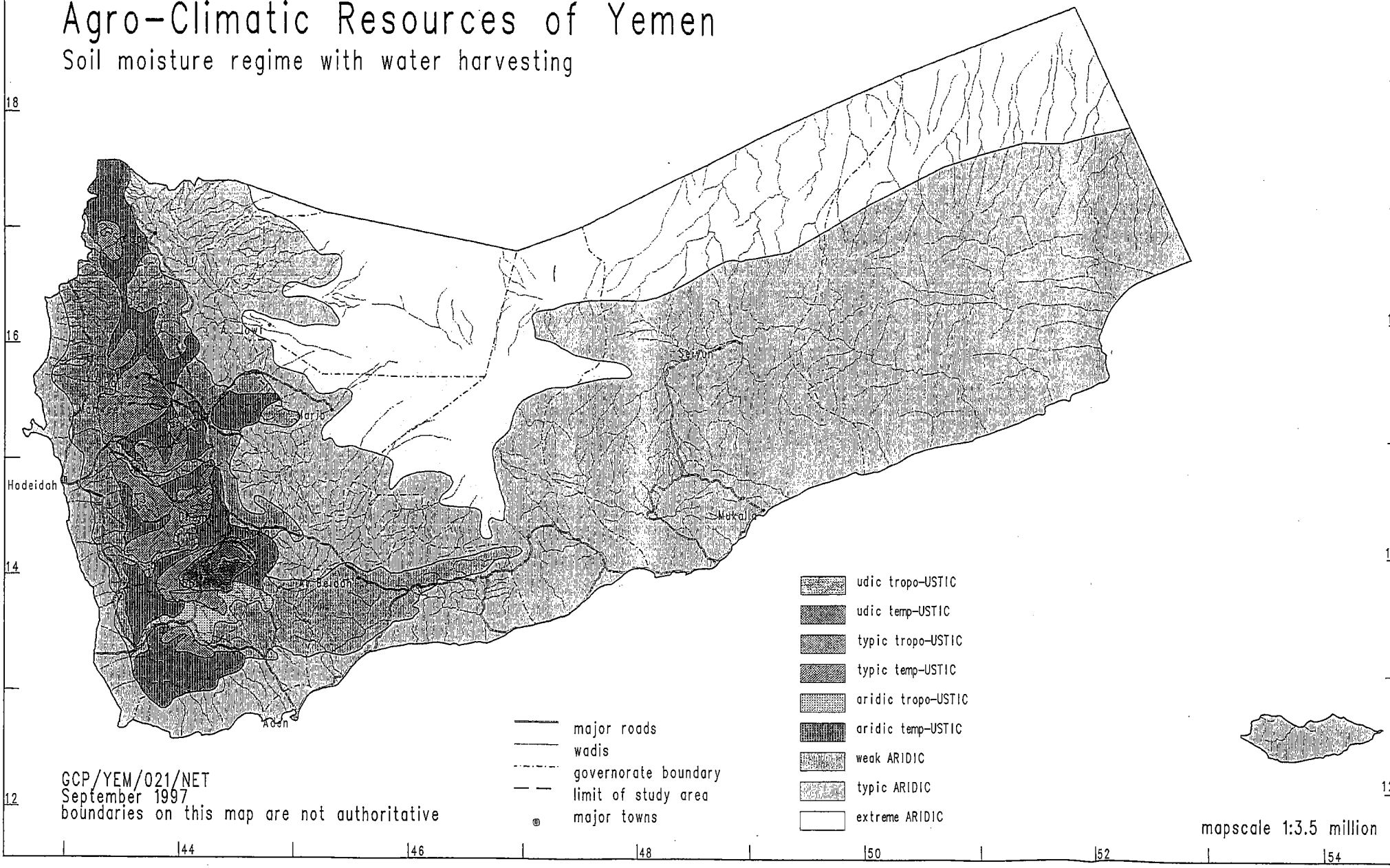
Agro-Climatic Resources of Yemen

Soil moisture regime with water harvesting



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September 1997
boundaries on this map are not authoritative

mapscale 1:3.5 million

Chapter 3

Description of the zones

3.1 Zone 1

location

Zone 1 is located in the Central Highlands on the Ibb plateau. The extend of the zone is limited, about 100 km². The altitude of the zone varies between 1500 and 2000 meters.

The representative agro-climatic station for zone 1 is Ibb. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone the two rainy seasons merge. The annual rainfall varies between 700 and 1200 mm (Figure 3.1). The rains start in March - beginning of April, intensify towards the end of July - August, and stop abruptly in October. The months November through February are generally dry, although an occasional thunderstorm can bring some rain during these months.

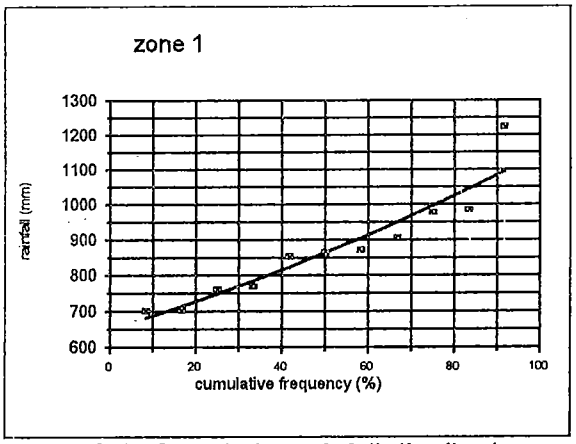


Figure 3.1: Cumulative rainfall distribution

Forty-five percent of the rain falls during the months April through June. The number of raindays with rainfall amounts above 5 mm/day varies between 35 and 65. The average amount of rainfall per rainday is 17 mm.

potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies between 2.8 mm/day during the dry, cold period and 3.7 mm/day during the months April-June. The average total amount of potential evapotranspiration in a year is about 1200 mm.

growing period

The growing period for zone 1 is a reliable normal growing period of 240 days from April 1 until December 1 (Figure 3.2).

During the growing period the rainfall amount (P) for an average year is about 800 mm, while the potential evapotranspiration (PET) for an average year is slightly less than 800 mm, resulting in a P/PET ratio of just above 1.

During wet years the growing period can start during February or end late December, while during dry years the start of the growing period is delayed by one or two decads (mid April).

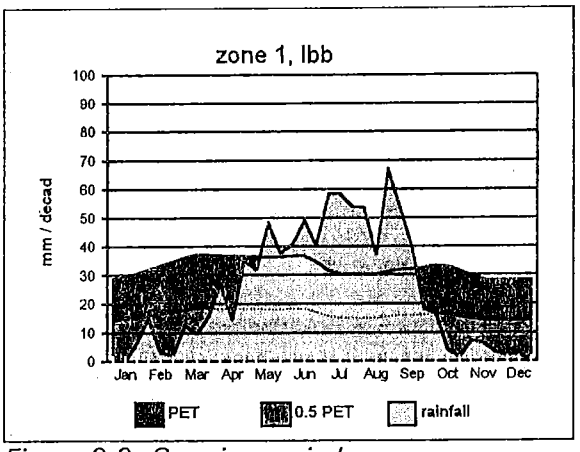


Figure 3.2: Growing period

temperatures (Figure 3.3)

In this zone the temperatures are dominantly controlled by the altitude. For every 100 meters rise in altitude, the mean annual maximum temperature decreases 0.65°C (0.4°C during the winter months and 0.8°C during the summer months), while the mean annual minimum temperature decreases 1.1°C (1.3°C during the dry months and 0.95°C during the wet period), and the mean annual temperature decreases 0.8°C.

The mean monthly maximum temperature for Ibb at 1900 m altitude varies between 24°C during the cold months of November through February and 29°C during the warm month of June. The mean monthly minimum temperature for Ibb varies between 6°C during the cold months November through January and 13°C during the wet months July and August.

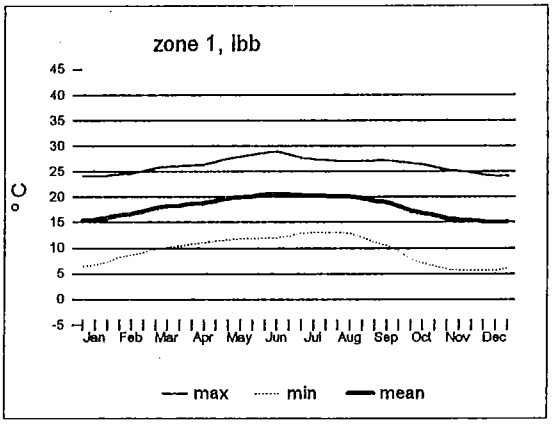


Figure 3 3: Temperatures

During the growing period the mean daily temperature varies between 15 and 20.5°C for Ibb (18-24°C at 1500 m and 14.5-21.5°C at 2000 m altitude). The mean daily temperature at the start of the growing period is 18.5°C (22°C at 1500 m and 18°C at 2000 m altitude).

During the months December and January the minimum temperature drops occasionally below 0°C in Ibb.

relative humidity

The mean daily relative humidity in zone 1 shows little variation over the year; 65 % during the dry season and 75% during the wet season (Figure 3.4).

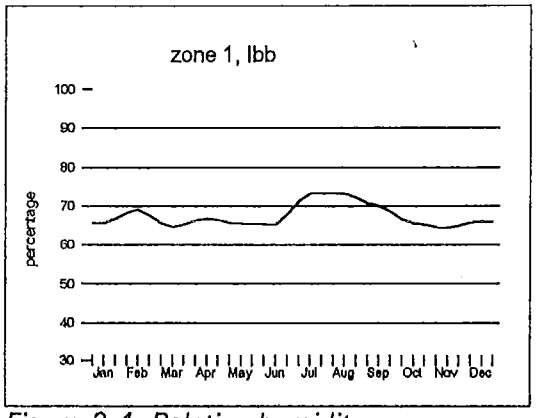


Figure 3.4: Relative humidity

sunshine and radiation (Figure 3.5)

The average number of sunshine hours is lowest during the height of the wet period (6.5 hours per day during July and August), while during the remainder of the year the average number of hours is rather constant, between 8 and 9 hours per day.

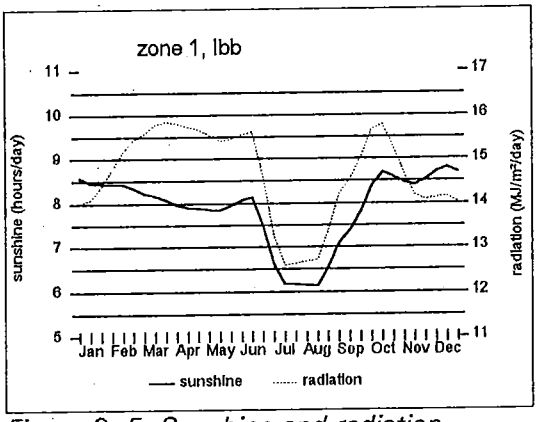


Figure 3. 5: Sunshine and radiation

This results in a net short-wave solar radiation (Rns) of 12.5-13.5 MJ/m²/day during July and August, 15-16 MJ/m²/day during March-June and September/October and 14-14.5 MJ/m²/day during November-February.

soil temperature regime

The soil temperature of Ibb at 50 cm depth varies between 19 and 23°C, with a mean annual soil temperature of 21.3°C (Figure 3.6). The soil temperature regime according to the Soil Taxonomy (1994) is classified as **Isothermic.**

The lowest temperatures occur during the cold dry season, while the highest temperatures are recorded during May, when the air temperatures are high and the soil is not yet saturated with water.

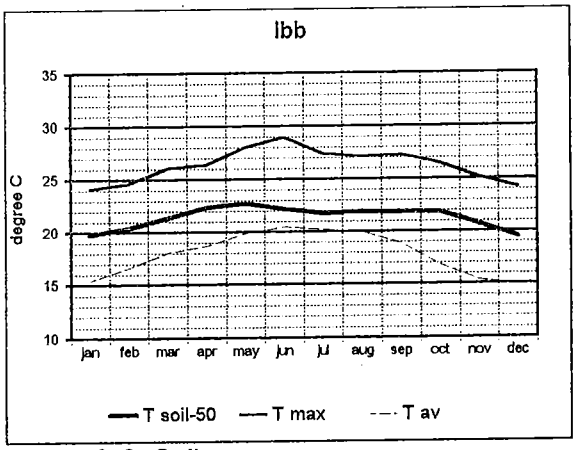


Figure 3.6: Soil temperature

The mean annual soil temperature in zones with similar soil moisture regimes is controlled by the altitude. For every 100 meters rise, the mean annual soil temperature drops 1°C. Therefore, below 1800 m altitude the soil temperature regime in zone 1 according to the Soil Taxonomy (1994) is classified as **Isohyperthermic.**

soil moisture regime

The soil moisture regime according to the Soil Taxonomy (1994) is **ustic.** According to the modifications proposed by Van Wambeke (1992) the soil moisture regime is classified as **typic tropo-ustic:**

	in 1 year out of 11 the soil is	dry tropo-udic
	in 2 years out of 11 the soil is	udic tropo-ustic
	in 7 years out of 11 the soil is	typic tropo-ustic
and,	in 1 year out of 11 the soil is	aridic tropo-ustic.

In all years water moves down through the soil during the months July, August and September.

The influence of terraces on the soil water content is limited. The rains start in March and by May/June the soil is saturated with water. This condition lasts until September. The rains stop abruptly in October, when the soil is still for the major part saturated with water. Runoff water supplied to the soil during the rainy period, will mostly move down through the soil or continue to run off. Runoff water supplied to the soil at the end of the rainy season will prolong the growing period with about 20 days.

With a terrace factor of 1 or more, the soil moisture regime according to the Soil Taxonomy (1994) is still **ustic**, while according to Van Wambeke (1982) the soil moisture regime changes to **udic tropo-ustic**:

	in 3 years out of 11 the soil is	dry tropo-udic
	in 4 years out of 11 the soil is	udic tropo-ustic
and,	in 4 years out of 11 the soil is	typic tropo-ustic.

3.2 Zone 2

location

Zone 2 is located around zone 1. The zone can be subdivided into 3 physiographic units, i.e. the extension of the Ibb plateau with altitudes varying between 1400 and 2000 meters (zone 2a), the steep escarpment slopes with altitudes ranging from 1800 to 3000 meters (zone 2b) and the flat intermontane plains and high plateaus with altitudes ranging between 2500 and 3000 meters (zone 2c). The extend of the various sub-zones is limited, zone 2a about 1200 km², zone 2b about 500 km² and zone 2c about 500 km².

The representative rainfall station for zone 2a is Al Udein, the representative rainfall station for zone 2b is Sumara and the representative agro-meteorology station for zone 2c is Yarim/Kitab. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there is only a limited dry interval between the two rainy seasons, and the two growing periods merge in most years to one growing period. The annual rainfall generally varies between 600 and 900 mm (Figure 3.7), with some years having exceptionally high rainfall exceeding 1200 mm. The rains start in March - beginning of April and last until the end of May. June is a relatively dry month. The rains begin again in July and stop abruptly in September. The months October through February are generally dry, although thunderstorms bring some rain during these months.

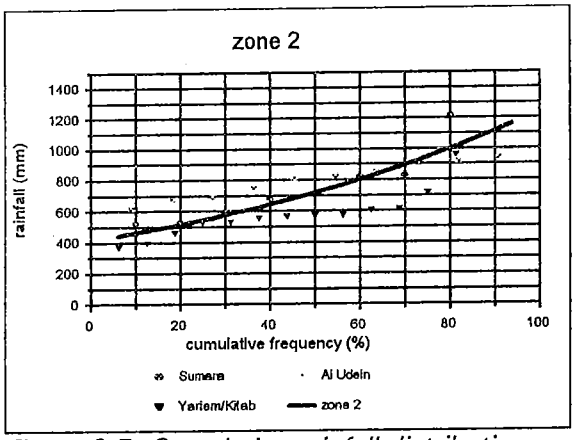


Figure 3.7: Cumulative rainfall distribution

Forty-five to fifty percent of the rain falls during the months April through June. The number of raindays with rainfall amounts above 5 mm/day varies between 45 and 60 for zone 2a, and between 30 and 60 for zones 2b and 2c. The exceptionally wet years have more than 80 raindays, and the dry years less than 25. The average amount of rainfall per rainday is 15-17 mm.

potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies for the different zones. For zone 2a (Al Udein at 1500 m) the average PET is 3.1-3.5 mm/day during the dry, cold period and 4.5-4.8 mm/day during the months April-June. For zone 2b (Sumara at 1800 m) the average PET is 3.2-3.5 mm/day during the dry, cold period and 4.7-4.8 mm/day during the months April-June.

For zone 2c (Yarim/Kitab at 2500 m) the average PET is 2.9-3.2 mm/day during the dry, cold period and 3.5-3.9 mm/day during the months April-June.

The average total amount of evapotranspiration per year is about 1500 mm for zone 2a, 1450 mm for zone 2b and 1325 mm for zone 2c.

growing period

The reliable normal growing period for zone 2 lasts 170-190 days, from April 1 (zone 2c) / April 20 (zone 2a) until September 20 (zone 2c) / October 20 (zone 2a), with sometimes a relatively dry interval of maximal 2 decads during the month of June (Figure 3.8a-c).

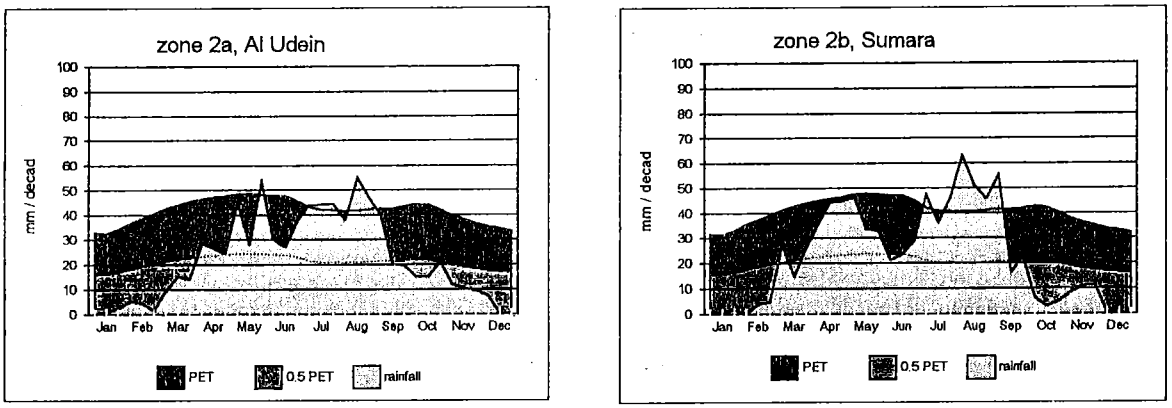


Figure 3.8: Growing period

During the growing period the rainfall amount (P) for an average year is 570 mm (zone 2c) to 700 mm (zone 2b), while the potential evapotranspiration (PET) for an average year is 700 mm (zone 2c) to 850 mm (zone 2a), resulting in a P/PET ratio of 0.75-0.85. The P/PET ratio for the first part of the growing period (April-June) is lower than for the second part of the growing period (June-October), 0.6-0.75 and 0.8-1 respectively.

During wet years the growing period can start during February or end late December, while during dry years the dry interval during the month of June becomes more pronounced.

temperatures (Figure 3.9)

The temperatures are dominantly controlled by the altitude. For every 100 meters rise in altitude, the mean annual maximum temperature decreases 0.65°C (0.4°C during the winter months and 0.8°C during the summer months), while the mean annual minimum temperature decreases 1.1°C (1.3°C during the dry

months and 0.95°C during the wet period) and the mean annual temperature decreases 0.8°C.

The mean monthly maximum temperature for Al Udein at 1500 m altitude varies between 26.5°C during the cold months of November through February and 33.5°C during the warm month of June. The mean monthly maximum temperature for Yarim/Kitab at 2500 m altitude varies between 20°C during the cold months of November through February and 26°C during the warm month of June.

The mean monthly minimum temperature for Al Udein varies between 10°C during the cold months November through January and 18°C during the wet months July and August. The mean monthly minimum temperature for Yarim/Kitab varies between 4.5°C during the cold months and 7.5°C during the wet months July and August.

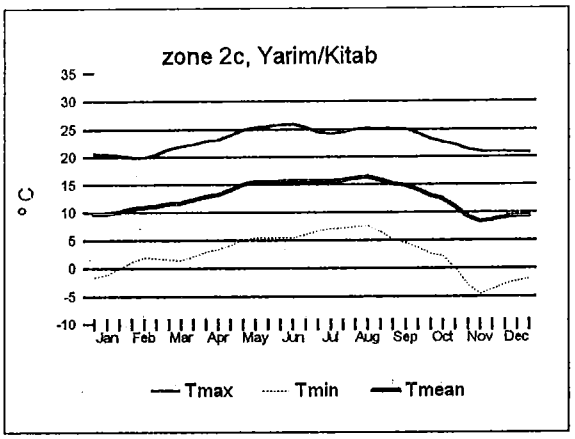


Figure 3.9: Temperatures

During the growing period the mean daily temperature varies between 22 and 25°C for Al Udein and between 13 and 16°C for Yarim/Kitab.

During the months December and January the minimum temperature does not drop below 0°C in zone 2a, drops occasionally below 0°C below 2200 m altitude in zone 2b. In the higher, more exposed parts of zone 2b and in the whole of zone 2c, the minimum temperature drops regularly below 0°C between October 15 and February 15. On average in Yarim/Kitab, the temperature drops over 60 days below 0°C of which about 1/3 is below -5°C.

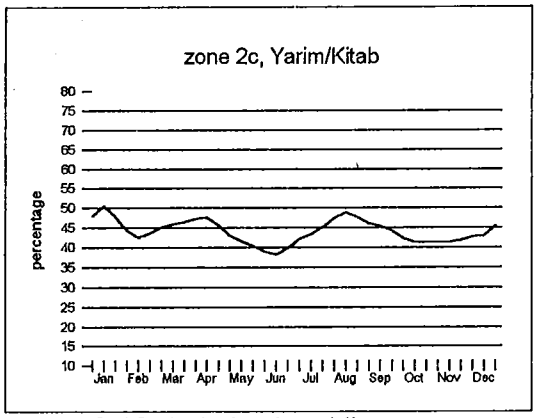


Figure 3.10: Relative humidity

relative humidity (Figure 3.10)

The mean daily relative humidity in zone 2 shows little variation over the year; between 55 and 65 % in zone 2a and b, and between 37 and 42 % in zone 2c.

sunshine and radiation (Figure 3.11)

The average number of sunshine hours is lowest during the height of the wet period (7 hours per day during July and August), while during the remainder of the year the average number of hours is rather constant, between 8.5 and 9.5 hours per day.

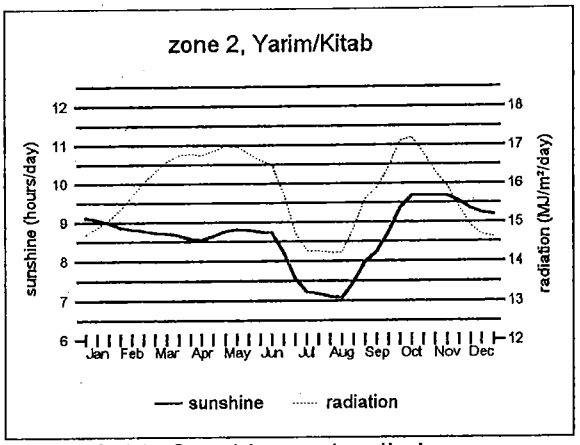


Figure 3.11: Sunshine and radiation

This results in a net short-wave solar radiation (Rns) for zone 2a of 13.5-14.5 MJ/m²/day during July and August, 15-16 MJ/m²/day during March-June and September/October and 13.5-14.5 MJ/m²/day during November-February. For zone 2b the net short-wave solar radiation (Rns) varies between 13.5-14 MJ/m²/day during July-September, 16-17 MJ/m²/day during March-June and October, and 13.5-15.5 MJ/m²/day during October-February. In Yarim/Kitab, zone 2c, the net short-wave solar radiation varies between 14-15 MJ/m²/day during July/August, 16-17 during March-June and September-November, and 14.5-15.5 during December-February.

soil temperature regime

The soil temperature of zone 2 at 50 cm depth is assumed to follow the pattern of Ibb. No data have been recorded for this depth in zone 2. Above 1800 m altitude the soil temperature regime according to the Soil Taxonomy (1994) is classified as **Isothermic.** Below 1800 m altitude the soil temperature regime according to the Soil Taxonomy (1994) is classified as **Isohyperthermic.**

The lowest temperatures occur during the cold dry season, while the highest temperatures are recorded during May, when the air temperatures are high and the soil is not yet saturated with water.

soil moisture regime

The soil moisture regime for zone 2 according to the Soil Taxonomy (1994) is **ustic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 2 is classified as **typic tropo-ustic:**

- zone 2a:

	in 1 year out of 10 the soil is	dry tropo-udic
	in 6 years out of 10 the soil is	typic tropo-ustic
and,	in 3 year out of 10 the soil is	aridic tropo-ustic.

- zone 2c:

	in 3 years out of 15 the soil is	dry tropo-udic
	in 5 years out of 15 the soil is	typic tropo-ustic
	in 3 years out of 15 the soil is	aridic tropo-ustic
	in 2 years out of 15 the soil is	weak aridic
and,	in 2 years out of 15 the soil is	typic aridic.

In wet years water moves down through the soil during the months July, August and September.

Terraces have a substantial impact on the soil water content, especially in dry years. The rains start in March and in dry years the soil is not yet saturated with water before the relatively dry interval of June starts. Runoff water supplied to the soil during the first half of the rainy period will increase the amount of water in the soil and minimize the effect of the dry interval. Runoff water supplied at the end of the rainy season will prolong the growing period with about 20 days.

With a terrace factor of 1 or more, the soil moisture regime according to the Soil Taxonomy (1994) is still **ustic**, while according to Van Wambeke (1982) the soil moisture regime changes to **udic tropo-ustic.**

3.3 Zone 3

location

Zone 3 is located in the Central Highlands, and stretches from south of Taiz unto north of Hajja. The zone consists of those areas that are not located in the rainshadow of the mountains. The extend of the zone is about 12400 km². The zone is intensively terraced.

Representative rainfall stations for zone 3 are Rhihab at 1500 m altitude, Hammam Ali at 2000 m altitude, Thula and Shibam at 2200 m altitude, while Hajja at 1100 m and Mahweet at 2000 m altitude are the agro-meteorological stations representative for this zone. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two distinct rainy seasons, in most years separated by a relatively dry interval (mid May-mid July). The annual rainfall generally varies between 400 and 700 mm (Figure 3.12), with some years having rainfall exceeding 800 mm.

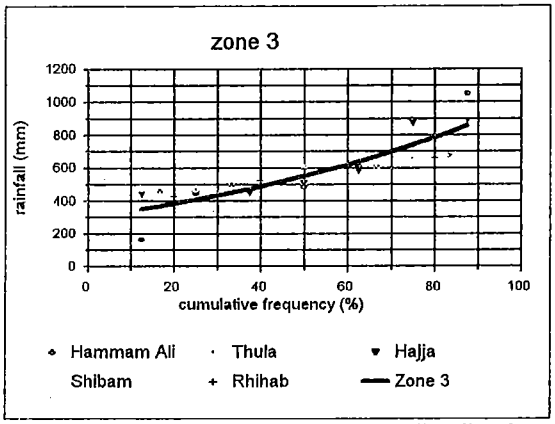


Figure 3.12: Cumulative rainfall distribution

The first rainy period starts in March - beginning of April, the second rainy period begins in July and stops abruptly end August. The months September through to February are generally dry, although occasional thunderstorms bring some rain during these months.

The zone can be subdivided into two sub-zones, according to the distribution of the rainfall amount over both growing periods. In zone 3a (Hajja and Hammam Ali) sixty percent of the rain falls during the months April through June. In zone 3b (Mahweet, Thula and Shibam) forty percent of the rain falls during the months April through June.

The number of raindays with rainfall amounts above 5 mm/day varies between 25 and 40 days, with the wet years having more than 50 raindays, and dry years less than 15. The average amount of rainfall per rainday is 16-19 mm.

potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies depending on altitude and wind exposure. For Rhihab and Hammam Ali the average PET is 3.2-4 mm/day during the dry, cold period and 4.5-5.2 mm/day during the months April-June. For Hajja the average PET is 2.7-3.3 mm/day during the dry, cold period and 4.5-4.8 mm/day during the months April-June. For Mahweet, Thula

and Shibam the average PET is 3.2-4 mm/day during the dry, cold period and 5.5-7 mm/day during the months April-June.

The average total amount of PET per year is about 1500-1550 mm for Rhihab and Hammam Ali, about 1425 mm for Hajja and 1625-1825 mm for Mahweet, Thula and Shibam.

growing period

The two growing periods for zone 3 are a reliable normal growing periods.

In zone 3a the first growing period of 90-100 days starts between March 20 and April 1 and ends July 1. The second growing period of 50 to 60 days starts July 20 and ends between September 10 and September 20. The dry interval between the two growing periods lasts 20 days (Figure 3.13a).

In zone 3b the first growing period of 60-80 days starts between March 20 and April 10 and ends between June 10 and June 20. The second growing period of 50 days starts between July 10 and July 20 and ends between September 1 and September 10. The dry interval between the two growing periods lasts 30 days (Figure 3.13b).

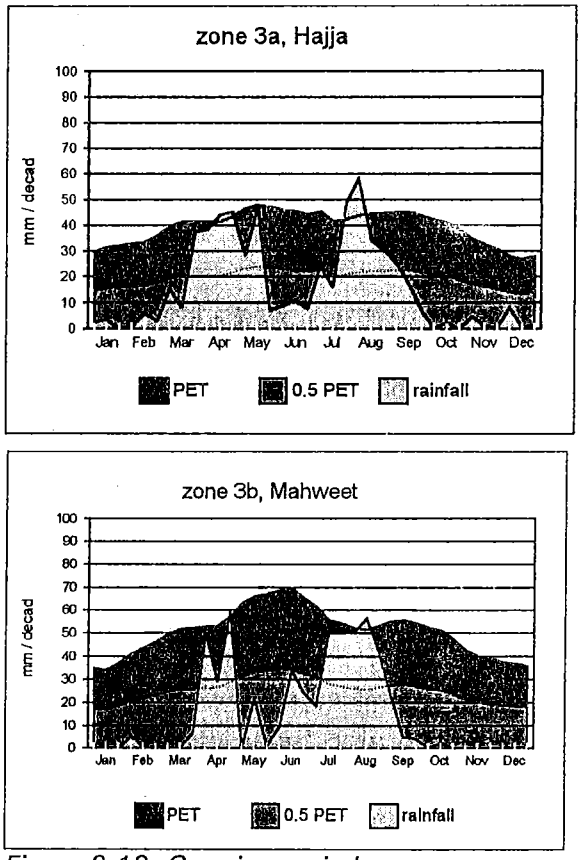


Figure 3.13: Growing period

During the first growing period the rainfall amount (P) for an average year is about 120-140 (zone 3b) to 230-275 (zone 3a) mm, while the potential evapotranspiration (PET) for an average year is 380-420 (zone 3b) to 450 (zone 3a) mm, resulting in a P/PET ratio of 0.5-0.6 for zone 3a and 0.35 for zone 3b.

During the second growing period the rainfall amount (P) for an average year is about 180-210 (zone 3b) to 250 (zone 3a) mm, while the potential evapotranspiration (PET) for an average year is 260-275 mm, resulting in a P/PET ratio 0.8 for zone 3a and 0.9-0.95 for zone 3b. The ratio rainfall/evapotranspiration for the total length of both growing periods including the dry interval is 0.5-0.6.

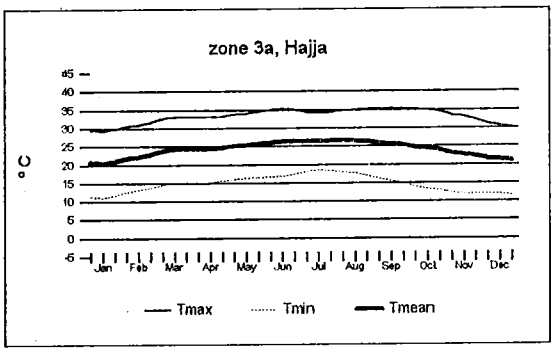
During wet years the growing period can end late December or the dry interval between the two growing periods is absent, while during dry years the start of the first or the second growing period is delayed.

Terracing has a great influence on the length of growing period in this zone. With a terrace factor of 1 both growing periods merge and the growing period is extended for thirty to forty days. In zone 3a this results in a growing period of 220-240 days starting between March 20 and April 1 and ending between November 1 and and November 20. In zone 3b the resulting growing period is 180-210 days starting between March 20 and April 10 and ending between October 1 and November 10.

temperatures (Figure 3.14a,b)

The temperatures are among other factors controlled by the altitude. In general, for every 100 meters rise in altitude, the mean annual maximum temperature decreases 0.47°C, while the mean annual minimum temperature decreases 0.4°C, and the mean annual temperature decreases 0.44°C. However, other factors like exposure have a great influence, especially on the minimum temperature.

The mean monthly maximum temperature for Hajja at 1100 m altitude varies between 29.5°C during the cold months of November through February and 35°C during the warm month of June. The mean monthly maximum temperature for Mahweet at 2000 m altitude varies between 25°C during the cold months of November through February and 36.5°C during the warm month of June.



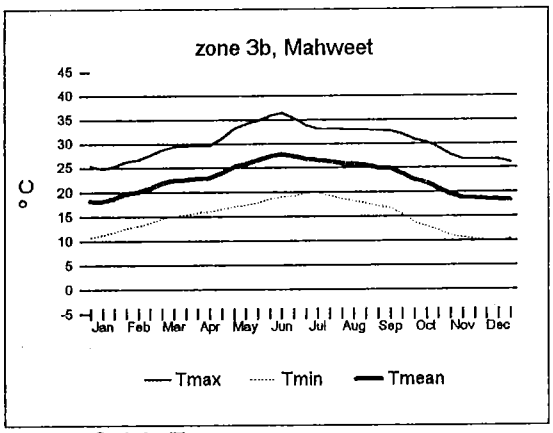


Figure 3.14: Temperatures

The mean monthly minimum temperature for Hajja varies between 11°C during the cold months November through January and 18.5°C during the wet month of July. The mean monthly minimum temperature for Mahweet varies between 10 during the cold months and 20° during the wet month of July.

During the growing period the mean daily temperature varies between 22 and 27.5°C for Hajja and between 21 and 27.5°C for Mahweet.

During the months December and January the minimum temperature drops occasionally below 0°C between 2000 and 2400 m altitude. In the higher, more exposed parts the minimum temperature drops regularly below 0°C between October 15 and February 15.

relative humidity (Figure 3.15)

The mean daily relative humidity in zone 3 varies according to the seasons. The mean daily relative humidity varies between 60 and 65 % during the cold and dry period, between 60 and 70 % during the wet months of July and August, and between 50 and 55 % during the hot, dry months of May and June.

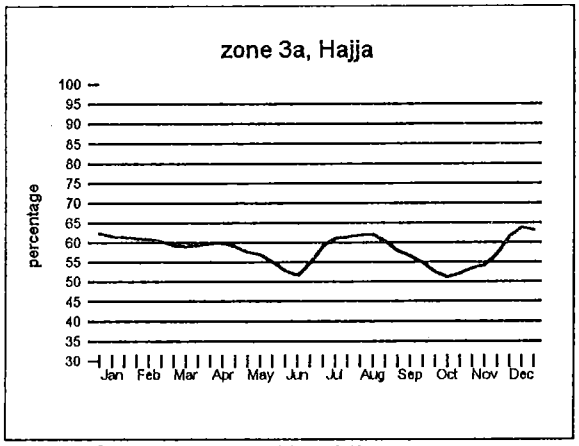


Figure 3.15: Relative Humidity

sunshine and radiation (Figure 3.16)

The average number of sunshine hours is lowest during the height of the wet period (6-7.5 hours per day during July and August), and highest during the months May/June and September-November (8.5-10 hours/day)

This results in a net short-wave solar radiation (Rns) for Hajja of 17.5-18 MJ/m²/day during May and September, 15-16 MJ/m²/day during June-August and 11-13 MJ/m²/day during November-February. For Mahweet the net short-wave solar radiation (Rns) varies between 19-20 MJ/m²/day during May/June and September, 14.5-15 MJ/m²/day during December and January, while during the remainder of the year the net short-wave radiation varies between 16 and 18 MJ/m²/day.

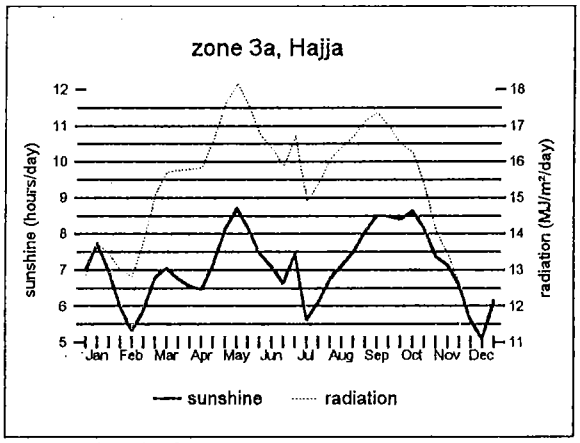


Figure 3.16: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 3. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and close to the average air temperature during the wet months.

This would give the following soil temperature regimes according to Soil Taxonomy (1994):

- for the terraced areas
  below 2300 m altitude **Isohyperthermic**
  above 2300 m altitude **Thermic**

- for the non-terraced areas
  below 1800 m altitude **Isohyperthermic**

1800-2300 m altitude	**Hyperthermic**
above 2300 m altitude	**Thermic**

soil moisture regime

Zone 3 is intensively terraced. Without taking the terrace factor into consideration, the soil moisture regime for zone 3a according to the Soil Taxonomy (1994) is **ustic**. According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 3a is classified as **aridic tropo/temp-ustic** (depending on altitude):

	in 4 years out of 14 the soil is	typic tropo/temp-ustic
	in 4 years out of 14 the soil is	aridic tropo/temp-ustic
	in 4 years out of 14 the soil is	weak aridic
and,	in 2 years out of 14 the soil is	typic aridic.

Without taking the terrace factor into consideration, the soil moisture regime for zone 3b according to the Soil Taxonomy (1994) is **aridic**. According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 3b is classified as **weak aridic**:

	in 2 years out of 10 the soil is	aridic tropo/temp-ustic
	in 5 years out of 10 the soil is	weak aridic
and,	in 3 years out of 10 the soil is	typic aridic.

In wet years water moves down through the soil during the month of August.

The terraces have a substantial impact on the soil water content. With a terrace factor of 1 or more, the soil moisture regime according to the Soil Taxonomy (1994) is **ustic** in the whole zone. According to Van Wambeke (1982) the soil moisture regime changes to **typic tropo/temp-ustic**.

3.4 Zone 4

location

Zone 4 is located in the southern part of the Central Highlands around Taiz. The extend of the zone is limited, about 2100 km². The altitude of the zone varies between 1000 and 2000 meters.

The representative agro-climatic/meteorological stations for zone 4 are Taiz (Osiferah), Taiz-airport, Warazan and Dhala. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two rainy seasons. The annual rainfall varies between 300 and 600 mm (Figure 3.17). Both rainy seasons are not very reliable.

The rains of the first rainy season start in April, but could be delayed until June and diminish towards end May-June. The second rainy season is more reliable. The rains start mid August to mid September, and end in October, but could also stop already before mid September. The months November through March are generally dry, although an occasional thunderstorm can bring some rain during these months.

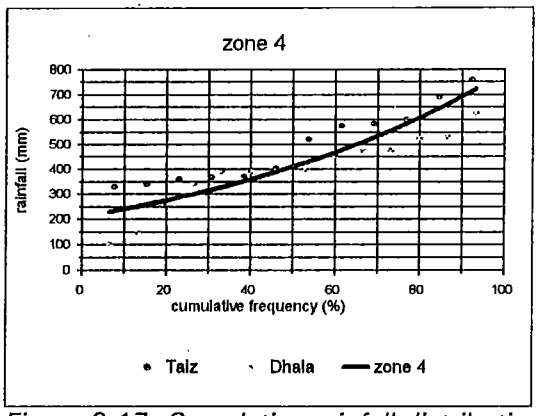


Figure 3.17: Cumulative rainfall distribution

Generally, thirty to forty-five percent of the rain falls during the months April through June. The number of raindays with rainfall amounts above 5 mm/day varies between 20 and 35. The average amount of rainfall per rainday is 17 mm.

potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies between 3-4 mm/day during the dry, cold period and 4.5-5.3 mm/day (Taiz at 1400 m altitude) and 5.5-6 mm/day (Warazan at 1100 m altitude) during the months April-October.

The average total amount of potential evapotranspiration in a year varies between 1600 mm (Taiz) and 1800 mm (Warazan).

growing period

The growing periods for zone 4 are moderately reliable growing periods. The first marginal growing period of 80 days starts April 20 and ends July 10,

although during dry years the growing period can start as late as June or end in June. The second intermediate growing period of 70 days is more reliable; it starts August 20 and ends November 1. In dry years the growing period can end in September, while in wet years the start can be in July. The dry interval between the two growing periods lasts 40 days (Figure 3.18).

During the first growing period the rainfall amount (P) for an average year is 150-170 mm, while the potential evapotranspiration (PET) for an average year is 430-480 mm, resulting in a P/PET ratio of about 0.35-0.4. During the second growing period the rainfall amount (P) for an average year is about 155-190 mm, while the potential evapotranspiration (PET) for an average year is 320-355 mm, resulting in a P/PET ratio of 0.5-0.6. The P/PET ratio for the total length of both growing periods including the dry interval is about 0.4.

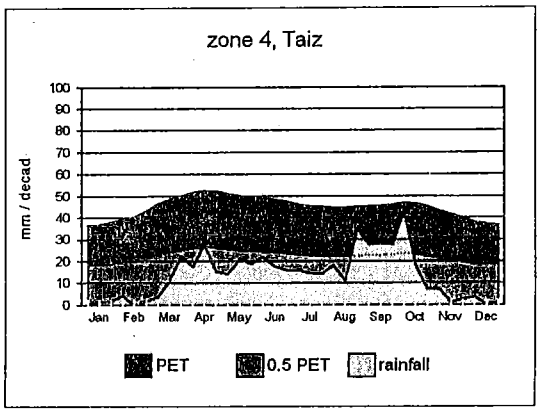


Figure 3.18: Growing period

Terracing increases the reliability and the length of the growing periods substantially. With a terrace factor of 2 or higher the first growing period becomes a reliable growing period of minimal 100 days starting between mid March and mid April and ending at the end of July, while the second growing period becomes a reliable growing period of 100-120 days, starting August 20 and ending in December. Generally a dry interval of 20-30 days during end July / August will separate the two growing periods. Only in wet years do the two growing periods merge.

temperatures (Figure 3.19)

The temperatures are dominantly controlled by the altitude. For every 100 meters rise in altitude, the mean annual maximum temperature decreases 0.65°C (0.4°C during the winter months and 0.8°C during the summer months), while the mean annual minimum temperature decreases 1.1°C (1.3°C during the dry months and 0.95°C during the wet period) and the mean annual temperature decreases 0.8°C.

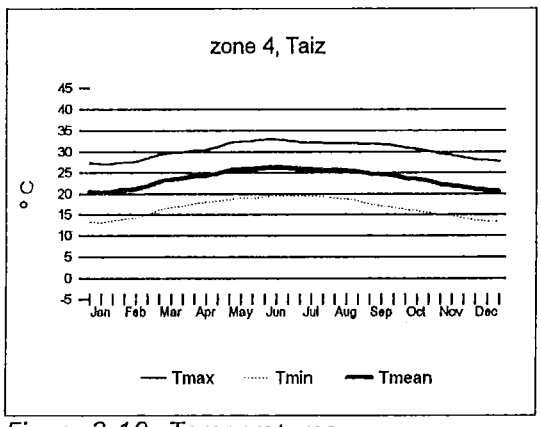


Figure 3.19: Temperatures

The mean monthly maximum temperature for Taiz at 1400 m altitude varies between 27-28°C during the cold months of November through February and 32-33°C during the May-September period.

The mean monthly minimum temperature for Taiz varies between 13-14°C during the cold months November through January and 18-20°C during the months April-August.

During the growing periods the mean daily temperature varies between 23.5 and 26°C.

During the months December and January the minimum temperature drops occasionally below 0°C above the altitude of 1800 m.

relative humidity (Figure 3.20)

The mean daily relative humidity in zone 4 is highest during the cold dry period (50-65 % from December through February), and lowest from March through May and during October (35-50 %).

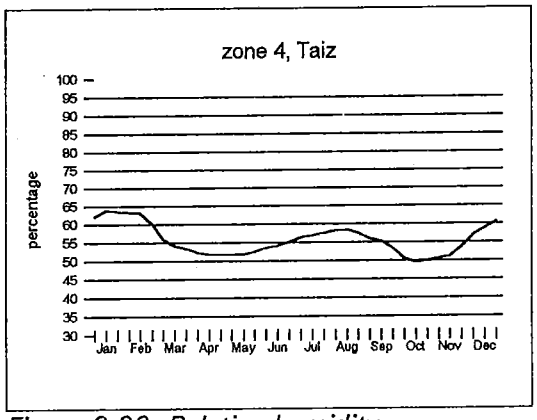


Figure 3.20: Relative humidity

sunshine and radiation (Figure 3.21)

The average number of sunshine hours is lowest during the height of the wet period (7-8 hours per day during July and August), while during the remainder of the year the average number of hours is rather constant, between 8 and 9 hours per day.

This results in a net short-wave solar radiation (Rns) of 15-16 MJ/m²/day during July and August, 16.5-19 MJ/m²/day during March-June and September/October and 13.5-15 MJ/m²/day during November-February.

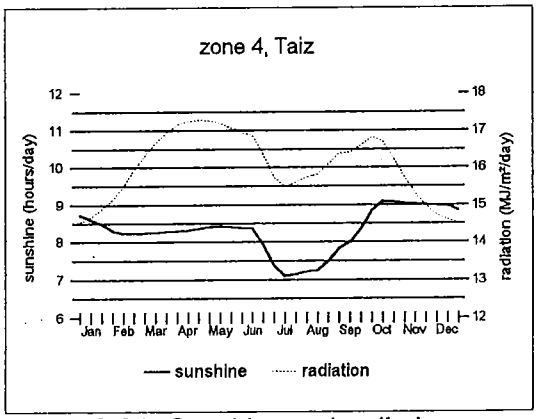


Figure 3.21: Sunshine and radiation

soil temperature regime

The soil temperature of Taiz at 50 cm depth varies between 24.3 and 27.5°C, with a mean annual soil temperature of 26.3°C (Figure 3.22). The soil temperature regime according to the Soil Taxonomy (1994) is classified as **Isohyperthermic.**

The lowest temperatures occur during the cold dry season, while the highest temperatures are recorded during June, when the air temperatures are highest.

The mean annual soil temperature in zones with similar soil moisture regimes is controlled by the altitude. For every 100 meters rise, the mean annual soil temperature drops 1°C. Therefore, above 1800 m altitude the soil temperature

regime in zone 4 according to the Soil Taxonomy (1994) is classified as **Isothermic.**

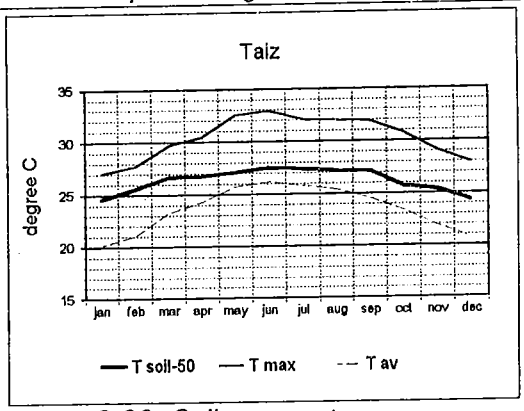


Figure 3.22: Soil temperature

soil moisture regime

The soil moisture regime according to the Soil Taxonomy (1994) is **aridic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime varies between **aridic tropo-ustic and typic aridic:**

	in 5 years out of 12 the soil is	aridic tropo-ustic
	in 1 year out of 12 the soil is	weak aridic
and,	in 6 years out of 12 the soil is	typic aridic

In most years water does not move down through the soil.

The influence of terraces on the soil water content is substantial. With a terrace factor of 2 or more, the soil moisture regime according to the Soil Taxonomy (1994) will change to **ustic**, while according to Van Wambeke (1982) the soil moisture regime changes to **aridic tropo-ustic:**

	in 5 years out of 12 the soil is	typic tropo-ustic
	in 5 years out of 12 the soil is	aridic tropo-ustic
and,	in 2 years out of 12 the soil is	weak aridic.

With a terrace factor of 2 or more, water moves in most years through the profile during the months April/May and September/October.

3.5 Zone 5

location

Zone 5 is located in the Central Highlands, and stretches from north of Ibb to the west of Sa'ada. The zone consists of those areas that are located in the rainshadow of the mountains and the northern Central Highlands. The extend of the zone is about 28900 km².

Representative rainfall stations for zone 5 are Habaka at 900 m altitude, and Al Masna'ah and Al Sanam at 2000 m altitude. No agro-meteorological stations are present in this zone. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two short rainy seasons, separated by a distinct dry interval (mid May-mid July). The annual rainfall generally varies between 200 and 450 mm (Figure 3.23), with some years having higher rainfall amounts above 600 mm.

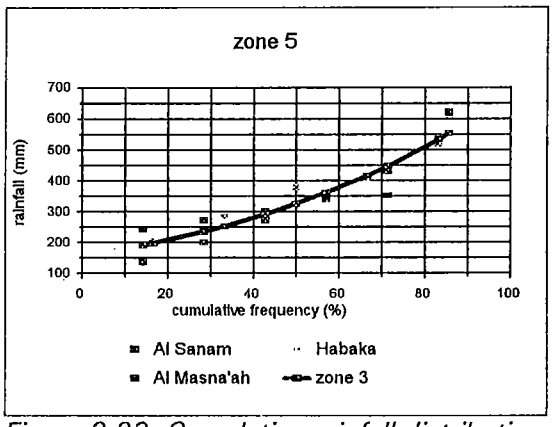


Figure 3.23: Cumulative rainfall distribution

The first rainy period starts in March/April, the second rainy period begins in July/August. The months September through February are generally dry, although occasional thunderstorms may bring some rain during these months.

The zone can be subdivided into two sub-zones, according to the distribution of the rainfall amount over both growing periods. In zone 5a (Al Sanam and Al Masna'ah) sixty percent of the rain falls during the months April through June. In zone 5b (Habaka) thirty-five percent of the rain falls during the months April through June.

The number of raindays with rainfall amounts above 5 mm/day varies between 10 and 25 days, with the wet years having more than 35 raindays. The average amount of rainfall per rainday is 16 mm for zone 5a and 21 mm for zone 5b.

potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies depending on altitude and wind exposure. For zone 5a, located at a higher altitude, the average PET is 3-3.5 mm/day during the dry, cold period and around 5 mm/day during the months April-June. For zone 5b, located at lower altitude the average PET is around 4 mm/day during the dry, cold period and 5-5.5 mm/day during the months April-June.

The average total amount of evapotranspiration per year is about 1500-1550 mm for zone 5a and 1700-1750 mm for zone 5b.

growing period

The first growing period for zone 5a and both growing periods for zone 5b are reliable growing periods. The second growing period for zone 5a does not develop in one year out of four .

In zone 5a the first marginal growing period of 60 days starts about April 1 and ends June 1. The second marginal growing period of about 30 days starts August 1 and ends September 1. The dry interval between the two growing periods lasts 60 days (Figure 3.24a).

In zone 5b the first marginal growing period of about 30 days starts around April 20 and ends around May 20. The second intermediate growing period of 50 days starts around July 1 and ends around September 1. The dry interval between the two growing periods lasts 50 days (Figure 3.24b).

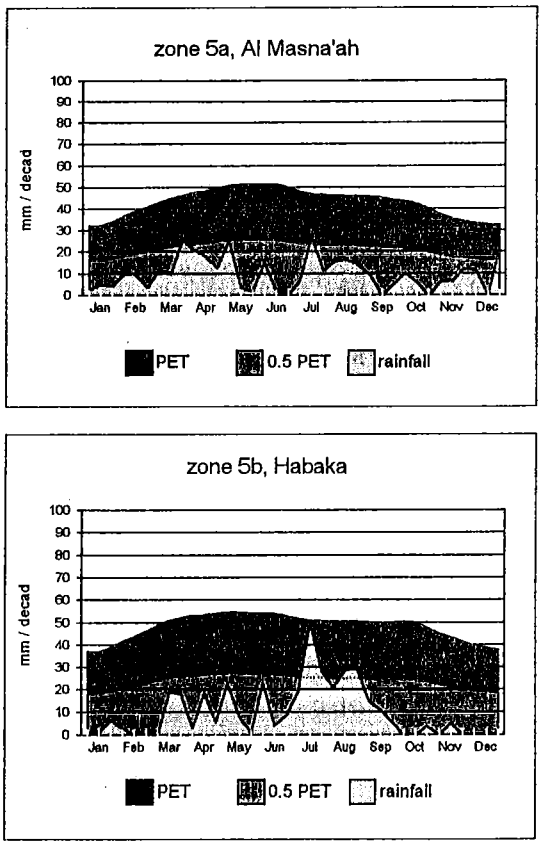


Figure 3.24: Growing period

For zone 5a the rainfall amount (P) for an average year during the first growing period is about 100 mm, while the potential evapotranspiration (PET) for an average year is about 300 mm, resulting in a P/PET ratio of 0.35. During the second growing period the rainfall amount (P) for an average year is about 50 mm, while the potential evapotranspiration (PET) for an average year is about 150 mm, resulting in a P/PET ratio of 0.35. The P/PET ratio for the total length of both growing periods including the dry interval (150 days) is 0.25.

For zone 5b the rainfall amount (P) for an average year during the first growing period is about 50 mm, while the potential evapotranspiration (PET) for an average year is about 150 mm, resulting in a P/PET ratio of 0.35. During the second growing period the rainfall amount (P) for an average year is about 150 mm, while the potential evapotranspiration (PET) for an average year is about 250 mm, resulting in a P/PET ratio of 0.6. The P/PET ratio for the total length of both growing periods including the dry interval (130 days) is 0.35.

During wet years the first growing period starts in March and/or the second growing period ends in October. The length of the dry interval in between the two growing periods does not shorten significantly.

In dry years the length of the dry interval in between the two growing periods is considerably lengthened, or the second growing period is absent (zone 5a).

Terracing has some influence on the length of growing period in this zone. With a terrace factor of 2 both growing periods are extended with about 20-30 days and the dry interval in between the two growing periods is reduced to about 30 days.

temperatures

No temperatures have been recorded in this zone. The temperatures are assumed to follow the pattern for zone 3, where the temperatures are among other factors controlled by the altitude. In general, for every 100 meters rise in altitude, the annual mean maximum temperature decreases 0.47°C, while the annual mean minimum temperature decreases 0.4°C, and the mean annual temperature decreases 0.44°C. However, other factors like exposure have a great influence, especially on the minimum temperature.

The extrapolated mean monthly maximum temperature for Habaka at 900 m altitude varies between 30°C during the cold months of November through February and 35°C during the warm month of August. The mean monthly maximum temperature for Al Sanam at 2000 m altitude varies between 25°C during the cold months of November through February and 32.5°C during the warm month of June.

The mean monthly minimum temperature for Habaka varies between 13°C during the cold months November through January and 20°C during August. The mean monthly minimum temperature for Al Sanam varies between 8 during the cold months and 17° during July/August.

During the growing period the mean daily temperature varies between 25 and 27°C for Habaka and between 21 and 24°C for Al Sanam.

Normally, no frost occurs in this zone.

relative humidity

No relative humidity has been recorded in this zone.

sunshine and radiation

No sunshine and radiation are recorded in this zone. However, interpolation of the number of sunshine hours (varying between 7 during the wet periods and 9 hours/day during the dry periods) gives a net short-wave solar radiation (Rns) varying between 17-18 MJ/m²/day during March-June and 14.5-15.5 MJ/m²/day during November-February.

soil temperature regime

No soil temperature data have been recorded in zone 5. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and close to the average air temperature during the wet months.

This would give the following soil temperature regimes according to Soil Taxonomy (1994):

below 1800 m altitude	**Isohyperthermic**
1800-2300 m altitude	**Hyperthermic**
above 2300 m altitude	**Thermic**

soil moisture regime

The soil moisture regime for zone 5 according to the Soil Taxonomy (1994) is **aridic.**

According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 5a is classified as **weak aridic** (depending altitude):

	in 5 years out of 12 the soil is	aridic tropo/temp-ustic
	in 3 years out of 12 the soil is	weak aridic
and,	in 4 years out of 12 the soil is	typic aridic.

According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 5b is classified as **typic aridic.**

The terraces have some impact on the soil water content. With a terrace factor of 2 or more, the soil moisture regime according to the Soil Taxonomy (1994) is **aridic/ustic** in zone 5a and **aridic** in zone 5b. According to Van Wambeke (1982) the soil moisture regime changes to **aridic tropo/temp-ustic** for zone 5a and **weak aridic** for zone 5b.

3.6 Zone 6

location

Zone 6 is located in the western part of the intermontane plain and stretches from south of Dhamar to north-west of Sana'a. The extend of the zone is about 1300 km².

Representative rainfall stations for zone 6 are Al Janat at 2200 m altitude, Rayda at 2250 m altitude and Mengida at 2200 m altitude, while Dhamar at 2400 m and Risaba at 2300 m altitude are the agro-meteorological stations representative for this zone. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two distinct rainy seasons, separated by a distinct dry interval (mid May - mid July). The annual rainfall generally varies between 200 and 400 mm, with some years having higher rainfall amounts above 500 mm (Figure 3.25).

The first rainy period starts in mid March - beginning of April, the second rainy period begins mid July - beginning of August and stops abruptly at the end August. The months September through to February are generally dry, although occasional thunderstorms may bring some rain during these months.

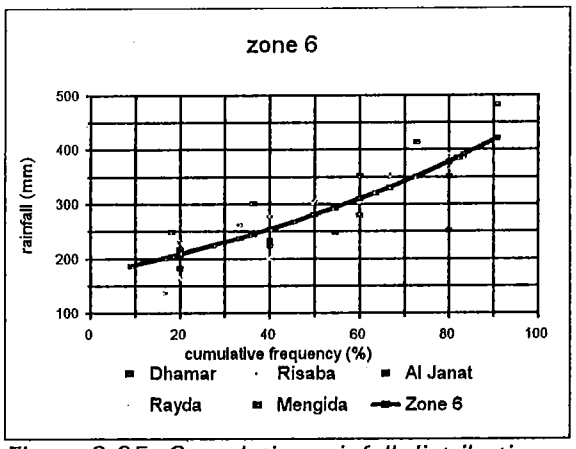


Figure 3.25: Cumulative rainfall distribution

The zone can be subdivided into two sub-zones, according to the distribution of the rainfall amount over both growing periods. In zone 6a (Dhamar and Risaba) fifty percent of the rain falls during the months April through June. In zone 6b (Al Janat, Rayda and Mengida) thirty-five percent of the rain falls during the months April through June.

The number of raindays with rainfall amounts above 5 mm/day varies between 15-25 days for zone 6a and 10-20 days for zone 6b. The average amount of rainfall per rainday is about 16 mm for zone 6a and 20 mm for zone 6b.

potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies depending on altitude and wind exposure. The PET is 3-4 mm/day during the dry, cold period and around 5 mm/day during the months May-June for zone 6a and around 6 mm/day for zone 6b.

The average total amount of evapotranspiration in a year is about 1500 mm for zone 6a and about 1700 mm for zone 6b.

growing period

The two growing periods for zone 6 are reliable growing periods. In zone 6a the first intermediate growing period of 60 days starts around April 1 and ends June 1. The second intermediate/normal growing period of 40 days starts July 20 and ends September 1. The dry interval between the two growing periods lasts 50 days (Figure 3.26a). In zone 6b the first marginal growing period of 30 days starts around April 10 and ends May 10. The second humid growing period of 40 days starts July 20 and ends September 1. The dry interval between the two growing periods lasts 70 days (Figure 3.26b).

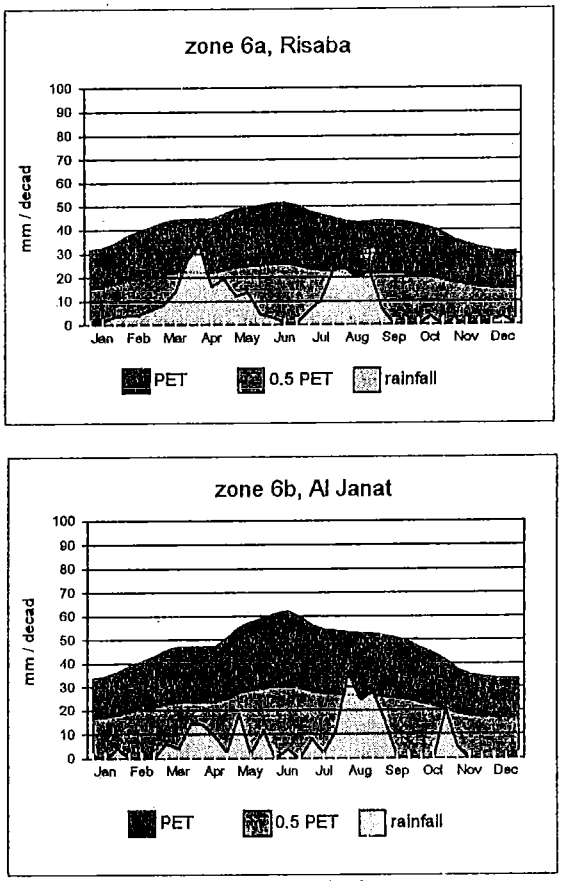


Figure 3.26: Growing period

For zone 6a the rainfall amount (P) for an average year during the first growing period is about 120-150 mm, while the potential evapotranspiration (PET) for an average year is about 280 mm, resulting in a P/PET ratio of 0.45-0.55. During the second growing period the rainfall amount (P) for an average year is about 100-140 mm, while the potential evapotranspiration (PET) for an average year is about 180 mm, resulting in a P/PET ratio of 0.55-0.75. The P/PET ratio for the total length of both growing periods including the dry interval (160 days) is 0.4.

For zone 6b the rainfall amount (P) for an average year during the first growing period is about 50-80 mm, while the potential evapotranspiration (PET) for an average year is about 150 mm, resulting in a P/PET ratio of 0.35-0.55. During the second growing period the rainfall amount (P) for an average year is about 150 mm, while the potential evapotranspiration (PET) for an average year is about 210 mm, resulting in a P/PET ratio of 0.7. The P/PET ratio for the total length of both growing periods including the dry interval (140 days) is 0.25.

During wet years the first growing period can start in the beginning of March, or a substantial amount of rain can fall in the period mid May to mid June, or the months November or December have a substantial amount of rainfall.

During dry years the start of the first or the second growing period is delayed (zone 6b) or the first growing period ends in the beginning of May.

Water harvesting has some influence on the length of growing period in this zone. With a terrace factor of 1 both growing periods are extended with twenty to thirty days. In zone 6a this results in a first growing period of 90 days starting March 20 and ending June 20 followed by a dry interval of 30 days and a second growing period of 60 days starting July 20 and ending September 20. In zone 6b this results in a first growing period of 50 days starting April 10 and ending June 1 followed by a dry interval of 50 days and a second growing period of 70 days starting July 20 and ending October 1.

temperatures (Figure 3.27)

Altitude differences in this zone are limited (2200-2500 m). Factors like exposure have a great influence on the temperature.

The mean monthly maximum temperature varies between 22-25°C during the cold months of November through February and 28-30°C during the warm month of June. The mean monthly minimum temperature varies between 0-3°C during the cold months November through January and 10-14°C during the wet month of July.

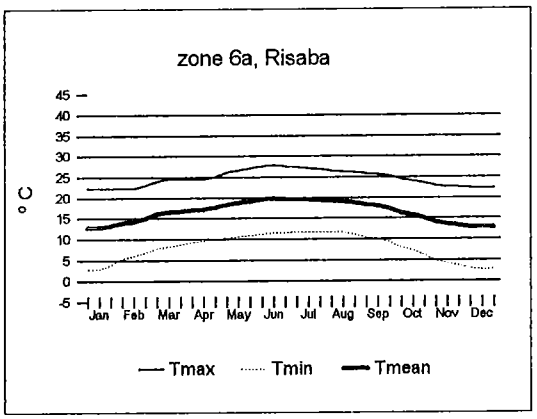


Figure 3.27: Temperatures

During the growing period the mean daily temperature varies between 17 and 20°C for zone 6a and between 18 and 22°C for zone 6b.

During the months November through January the minimum temperature drops frequently below 0°C. In Risaba the temperature drops below 0°C during 45-60 days per year, of which one-quarter is below -5°C. Temperatures below 0°C can occur from mid-October to mid-March. November through January have the highest number of days with minimum temperatures below 0°C.

relative humidity (Figure 3.28)

The mean daily relative humidity in zone 6 varies according to the seasons. The mean daily relative humidity varies between 40 and 50 % during the cold and dry period, between 50 and 65 % during the wet months of July and August, and between 25 and 40 % during the hot, dry months of May and June.

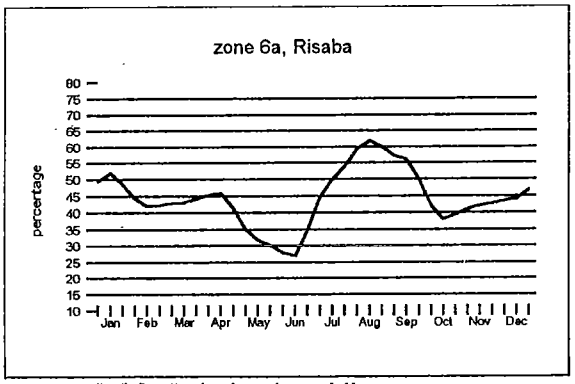


Figure 3.28: Relative humidity

sunshine and radiation (Figure 3.29)

The average number of sunshine hours is lowest during the height of the wet period (6.5-7.5 hours per day during July and August), and highest during the months October-November (9.5-10 hours/day).

This results in a net short-wave solar radiation (Rns) of 17.5-19 MJ/m²/day during May and September, 15-17 MJ/m²/day during June-August and 15-16 MJ/m²/day during November-February.

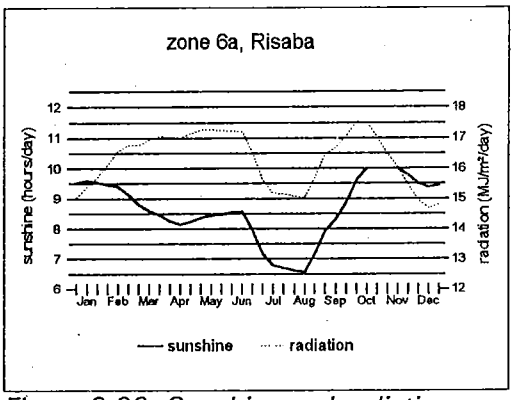


Figure 3.29: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 6. For Dhamar the soil temperature has been recorded for 20 cm depth. At 20 cm depth the soil temperature follows closely the maximum air temperature. The soil temperature at 20 cm depth is lowest during the cold, dry months (20°C) and highest in June, when the air temperature is high and the soil is dry (25.8°C)

It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and closer to the average air temperature during the months when the soil is wet (April and July/August). The expected lowest soil temperature would then be around 18°C during the cold period, and the expected highest soil temperature 23°C during the summer months. The yearly average soil temperature is expected to be 20.5°C.

According to Soil Taxonomy (1994) the soil temperature would be **Thermic/Isothermic.**

soil moisture regime

Zone 6 is flat to undulating, and only the sloping parts are terraced. Water harvesting is practiced, but the amount of water collected is limited.

Without taking water harvesting into consideration, the soil moisture regime for zone 6 according to the Soil Taxonomy (1994) is **aridic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 6a is classified as **weak aridic:**

	in 2 years out of 15 the soil is	aridic temp-ustic
	in 9 years out of 15 the soil is	weak aridic
and,	in 4 years out of 15 the soil is	typic aridic.

Without taking the terrace factor into consideration, the soil moisture regime for zone 6b according to the Soil Taxonomy (1994) is **aridic.** According to the

modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 6b is classified as **weak aridic:**

in 9 years out of 9 the soil is weak aridic.

Water harvesting has some impact on the soil water content. With a terrace factor of 1, the soil moisture regime according to the Soil Taxonomy (1994) is **aridic/ustic** in zone 6a and **aridic** in zone 6b. According to Van Wambeke (1982) the soil moisture regime changes to **weak aridic / aridic temp-ustic** for zone 6a and remains **weak aridic** for zone 6b.

3.7 Zone 7

location

Zone 7 is located in the eastern and northern part of the intermontane plains and stretches from south of Rada to Sa'ada. The extend of the zone is about 5000 km².

Representative agro-meteorological stations for zone 7 are Rada at 2100 m altitude, Sana'a and Al Irra at 2200 m altitude and Sa'ada and Dumeid at 1800 m altitude. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two rainy seasons, separated by a distinct dry interval (May - mid July). The annual rainfall generally varies between 100 and 200 mm (Rada 250 mm), with some years having higher rainfall amounts above 350 mm (Figure 3.30). The first rainy period starts in mid March - beginning of April, the second rainy period begins mid July - beginning of August and stops abruptly end of August. The months September through February are generally dry, although occasional thunderstorms may bring some rain during these months.

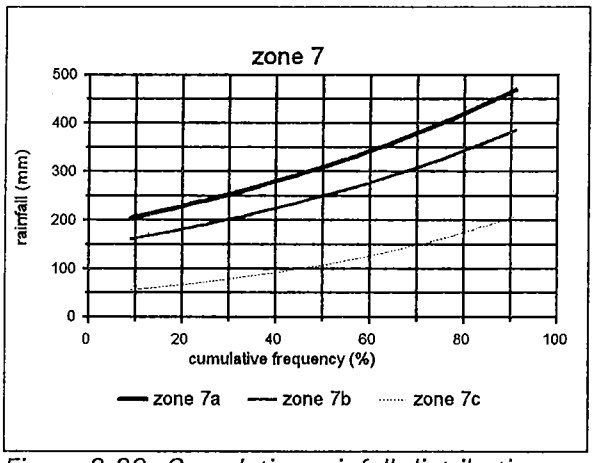


Figure 3.30: Cumulative rainfall distribution

Sixty-five to seventy-five percent of the rain falls during the months January-June.

The zone can be subdivided into three sub-zones, according to the length and the reliability of the growing periods.

The number of raindays with rainfall amounts above 5 mm/day varies between 5-15 days for zones 7a (Rada) and zone 7b (Sana'a, Al Irra) and 5-10 days for zone 7c (Dumeid, Sa'ada). The average amount of rainfall per rainday is about 16-17 mm.

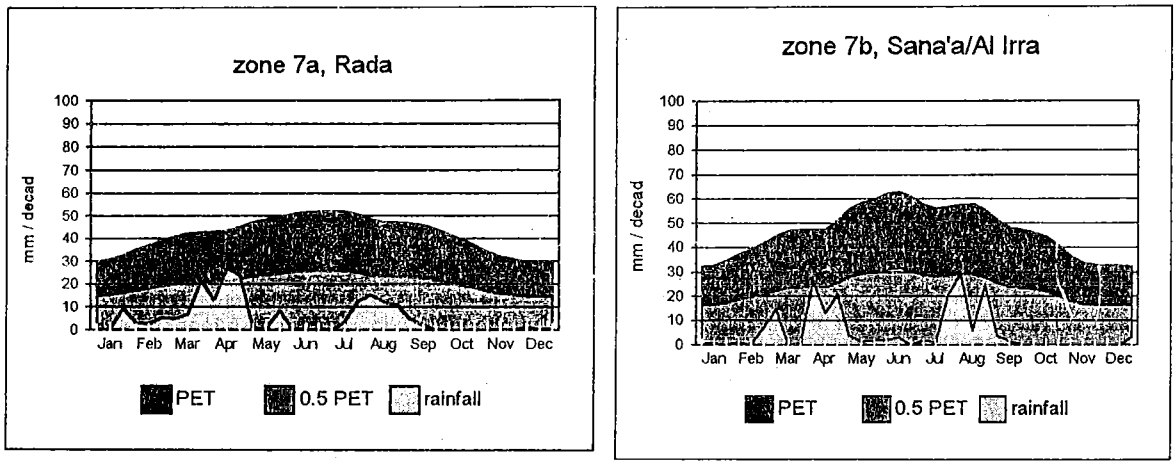
potential evapotranspiration

The potential evapotranspiration (PET) for an average year varies depending on altitude, wind exposure and latitude. The PET varies between 3-3.5 mm/day during the dry, cold period and 5-6 mm/day during the months May-June.

The average total amount of evapotranspiration per year is about 1500 mm/year for zone 7a, around 1700 mm/year for zone 7b and 1600 mm/year for zone 7c.

growing period

The first growing period for zone 7 is a reliable, but short growing period. The second growing period is not reliable.



In zone 7a the first intermediate growing period of 40 days starts around April 10 and ends May 20. The second marginal growing period of 30 days starts August 1 and ends September 1 (Figure 3.31a).

In zone 7b the first marginal growing period of 30 days starts April 10 and ends May 10. The second marginal growing period of 20 days starts July 20 and ends August 10 (Figure 3.31b).

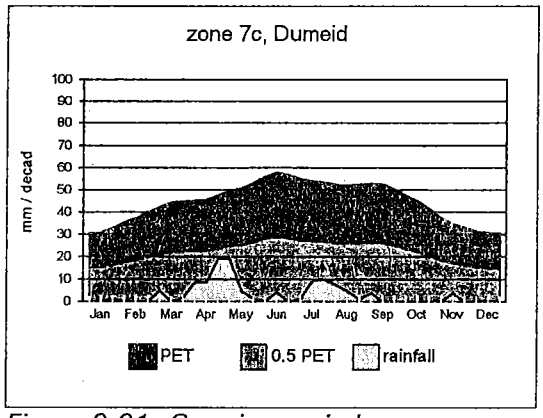


Figure 3.31: Growing period

In zone 7c the first intermediate growing period of 20 days starts April 20 and ends May 10. The second maginal growing period of 20 days starts July 20 and ends August 10 (Figure 3.31c).

The dry interval between the two growing periods lasts 70 days. The second growing period does not always develop. In zone 7a in 1 year out of 3 the second growing period is lacking, in zone 7b in 1 year out of 2 the second growing period is lacking and in zone 7c in 2 years out of 3 the second growing period is lacking.

For zone 7a the rainfall amount (P) for an average year during the first growing period is about 80 mm, while the potential evapotranspiration (PET) for an average year is about 180 mm, resulting in a P/PET ratio of 0.45. During the second growing period the rainfall amount (P) for an average year is about 50

mm, while the potential evapotranspiration (PET) for an average year is about 150 mm, resulting in a P/PET ratio of 0.3.

For zone 7b the rainfall amount (P) for an average year during the first growing period is about 45 mm, while the potential evapotranspiration (PET) for an average year is about 150 mm, resulting in a P/PET ratio of 0.3. During the second growing period the rainfall amount (P) for an average year is about 35 mm, while the potential evapotranspiration (PET) for an average year is about 110 mm, resulting in a P/PET ratio of 0.3.

For zone 7c the rainfall amount (P) for an average year during the first growing period is about 50 mm, while the potential evapotranspiration (PET) for an average year is about 100 mm, resulting in a P/PET ratio of 0.5. During the second growing period the rainfall amount (P) for an average year is about 25 mm, while the potential evapotranspiration (PET) for an average year is about 100 mm, resulting in a P/PET ratio of 0.25.

During wet years the first growing period can start in March, or a some rain can fall during mid May / mid June. During dry years the second growing period does not develop.

Water harvesting has little influence on the length of growing period in this zone. With a terrace factor of 1 both growing periods are extended with ten to twenty days.

temperatures (Figure 3.32a,b)

Altitude differences in this zone are limited (1800-2200 m). Factors like exposure and latitude have a great influence on the temperature.

The mean monthly maximum temperature varies between 22-25°C during the cold months of November through January and 30-31°C during the warm months of June-August. The mean monthly minimum temperature varies between 3-5°C during the cold months and 14-17°C during the wet months of July/August.

During the growing period the mean daily temperature varies between 19 and 24°C.

During the months November through February the minimum temperature drops regularly below 0°C in zone 7b and in most

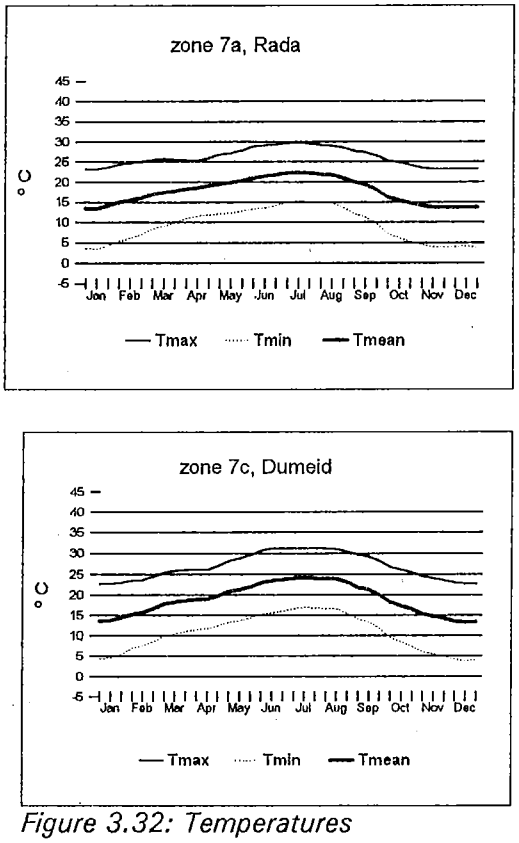


Figure 3.32: Temperatures

of the years in zone 7a. In zone 7a and 7b the temperature drops below 0°C for about 20 days per year, of which one-quarter is below -5°C. In zone 7c the temperature drops seldom below 0°C.

relative humidity (Figure 3.33)

The mean daily relative humidity in zone 7 varies according to the seasons. The mean daily relative humidity is highest (40-60%) during the cold and dry period, between 40 and 55 % during the wet months of July and August, and between 30 and 50 % during June and September/October.

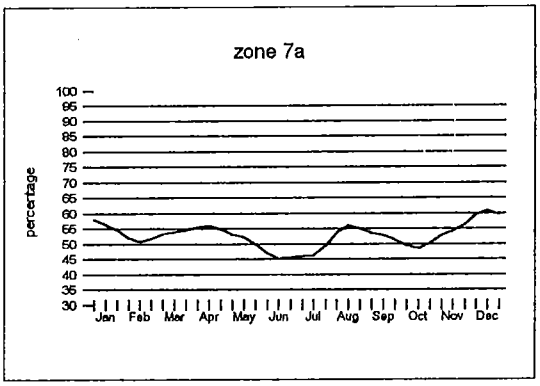


Figure 3.33: Relative humidity

sunshine and radiation (Figure 3.34)

The average number of sunshine hours is lowest during July and August (7-8 hours per day), and highest during the months May-June and October-November (9-11 hours/day).

This results in a net short-wave solar radiation (Rns) of 18-19 MJ/m²/day during May/June, 16-17 MJ/m²/day during July/August and 15-16 MJ/m²/day during November-January.

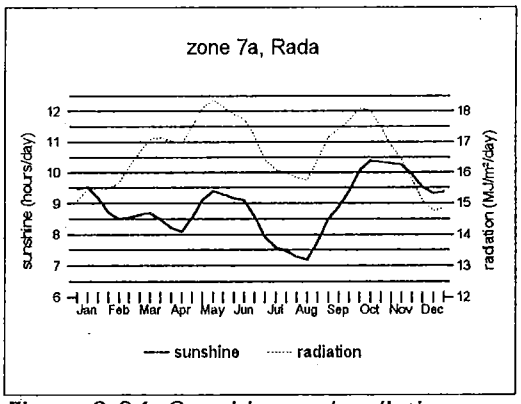


Figure 3.34: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 7. For Al Irra and Dumeid the soil temperatures have been recorded for 20 cm depth. The soil temperature at 20 cm depth is lowest during the cold, dry months (18-20°C) and highest in June, when the air temperature is high and the soil is dry (26-30°C)

It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and closer to the average air temperature during the months when the soil is wet (April and July/August).

The expected lowest soil temperature would then be around 19°C during the cold period, and the expected highest 25°C during the summer months. The yearly average soil temperature is expected to be about 22.5°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic.**

soil moisture regime

Zone 7 is flat to undulating, and only the sloping parts are terraced. Water harvesting is practiced, but the amount of water collected is limited.

Without taking water harvesting into consideration, the soil moisture regime for zone 7 according to the Soil Taxonomy (1994) is **aridic**. According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 7 is classified as **typic aridic**:

in 6 years out of 21 the soil is weak aridic
and, in 15 years out of 21 the soil is typic aridic.

Water harvesting has some impact on the soil water content. With a terrace factor of 1, the soil moisture regime according to the Soil Taxonomy (1994) is still **aridic** in zone 7. According to Van Wambeke (1982) the soil moisture regime changes to **weak aridic** for zone 7a and b and remains **typic aridic** for zone 7c.

3.8 Zone 8

location

Zone 8 consists of the higher parts of the Tihama. The extend of the zone is about 5300 km².

The representative agro-meteorological station for zone 8 is Gerba at about 250 m altitude. Al Dimnah at 250 m altitude and Al Jaruba at 300 m altitude are representative rainfall stations. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two rainy seasons, separated by a distinct dry interval (June/July). The annual rainfall generally varies between 200 and 500 mm (Figure 3.35). The first rainy period is not well developed. It starts in beginning of May and ends at the end of May. The second rainy period begins in August and lasts until mid October. The months November through April are generally dry, although occasional thunderstorms can bring some rain during these months.

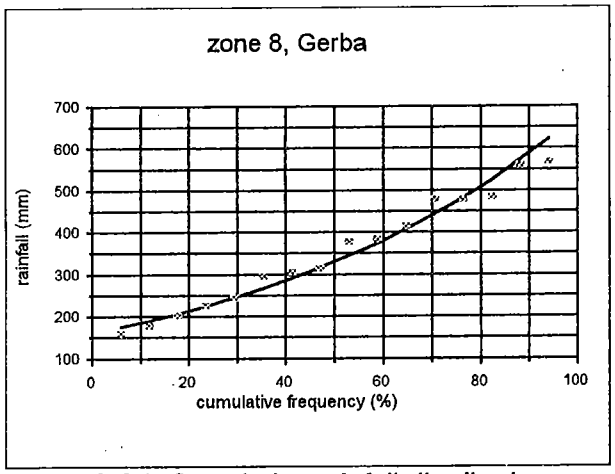


Figure 3.35: Cumulative rainfall distribution

Sixty-five to seventy-five percent of the rain falls during the months July-December. The number of raindays with rainfall amounts above 5 mm/day varies between 10-25 days. The average amount of rainfall per rainday is about 22 mm.

potential evapotranspiration

The potential evapotranspiration is about 4 mm/day during the dry, cool period and 6-6.5 mm/day during the months May-June. The average total amount of evapotranspiration per year is about 1800-1900 mm/year.

growing period

The first growing period for zone 8 is a short growing period, which does not develop well every year. The second

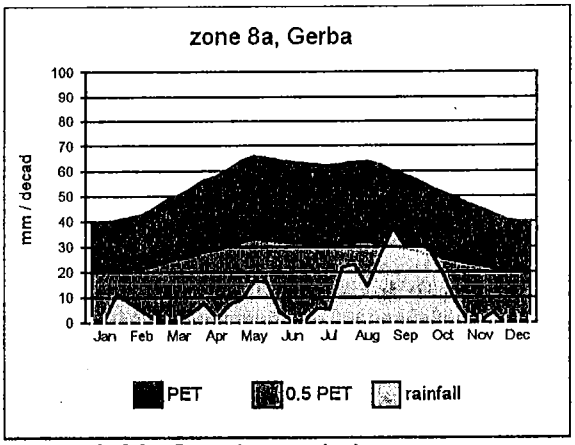


Figure 3.36: Growing period

growing period is reliable. The first marginal growing period of 20 days starts around May 1 and ends May 20. The second intermediate growing period of 70 days starts August 1 and ends October 10. The dry interval between the two growing periods lasts 70 days (Figure 3.36).

The rainfall amount (P) for an average year during the first growing period is about 50 mm, while the potential evapotranspiration (PET) for an average year is about 130 mm, resulting in a P/PET ratio of 0.4. During the second growing period the rainfall amount (P) for an average year is about 200 mm, while the potential evapotranspiration (PET) for an average year is about 380 mm, resulting in a P/PET ratio of 0.6.

During wet years the second growing period can last until mid November. During dry years the first growing period does not develop.

Water harvesting has little influence on the length of growing period in this zone. With a terrace factor of 1 both growing periods are extended with a maximum of ten days.

temperatures (Figure 3.37)

Altitude differences are limited (200-400 m). The mean monthly maximum temperature varies between 32°C during the cool months of November through January and 40°C during the warm months of June-August. The mean monthly minimum temperature varies between 18.5°C during the cool months and 27°C during the warm months of June-August.

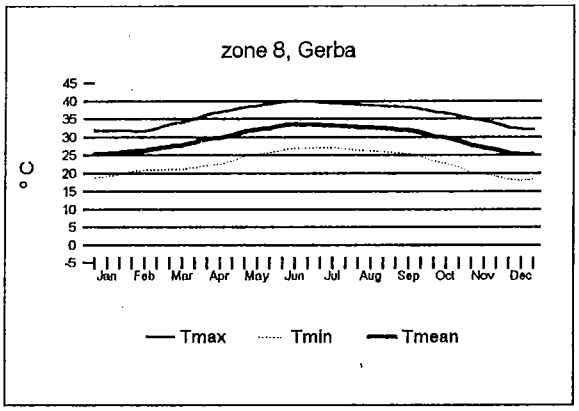


Figure 3.37: Temperatures

During the second growing period the mean daily temperature varies between 30 and 33°C.

relative humidity (Figure 3.38)

The mean daily relative humidity in zone 8 varies little over the year. The mean daily relative humidity ranges from 60 % during the warm months to 70 % during the cool months.

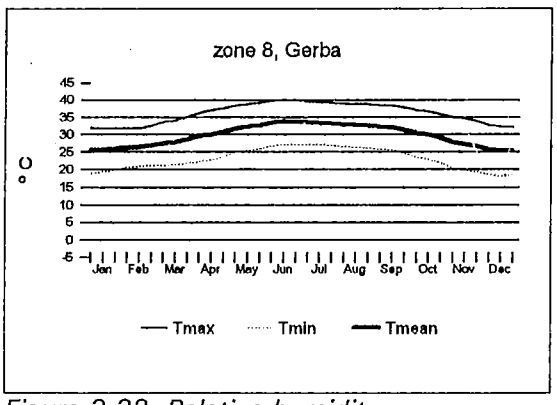


Figure 3.38: Relative humidity

sunshine and radiation (Figure 3.39)

The average number of sunshine hours is lowest in July (6.5-7 hours per day), and highest during the months May and October-November (10 hours/day).

This results in a net short-wave solar radiation (Rns) of 19 MJ/m²/day during May/June and 14-15 MJ/m²/day during December-February.

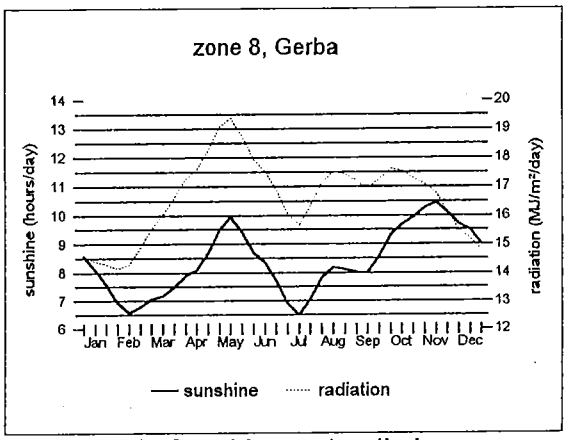


Figure 3.39: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 8. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and closer to the average air temperature during the months when the soil is wet (August/September).

The expected lowest soil temperature would then be around 30°C during the cool period, and the expected highest 37°C during the summer months. The yearly average soil temperature is expected to be about 33°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic.**

soil moisture regime

Zone 8 is undulating to rolling, and only the sloping parts are terraced. Water harvesting is practiced, but the amount of water collected is limited. Without taking water harvesting into consideration, the soil moisture regime for zone 8 according to the Soil Taxonomy (1994) is **aridic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 8 is classified as **weak aridic:**

	in 10 years out of 16 the soil is	weak aridic
and,	in 6 years out of 16 the soil is	typic aridic.

Water harvesting has little impact on the soil water content. With a terrace factor of 1, the soil moisture regime according to the Soil Taxonomy (1994) is still **aridic** in zone 8. According to Van Wambeke (1982) the soil moisture regime remains **weak aridic**

3.9 Zone 9

location

Zone 9 consists of parts of the Tihama. The extend of the zone is about 4800 km².

The representative agro-meteorological station for zone 9 are Zabid at about 100 m altitude and As Zuhra at 70 m altitude. Al Khalifah at 140 m altitude, Al Mahatt at about 100 m altitude and Ad Dahi at 90 m altitude are representative rainfall stations. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two rainy seasons, separated by a distinct dry interval (June/July). The annual rainfall generally varies between 100 and 250 mm (Figure 3.40), with some years having higher rainfall amounts exceeding 400 mm.

The first rainy period is not well developed. It starts in beginning of May and ends at the end of May. The second rainy period begins in August and lasts until the beginning of October. The months November through April are generally dry, although occasional thunderstorms can bring some rain during these months.

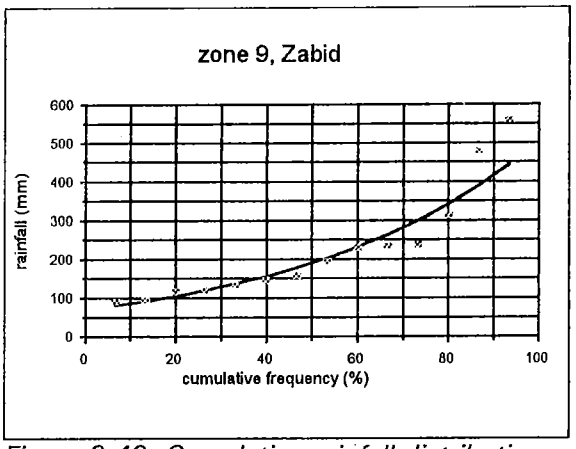


Figure 3.40: Cumulative rainfall distribution

Seventy to eighty percent of the rain falls during the months July-December. The number of raindays with rainfall amounts above 5 mm/day varies between 5-15 days. The average amount of rainfall per rainday is about 20-22 mm.

potential evapotranspiration

The potential evapotranspiration is about 4 mm/day during the dry, cool period and 6-6.5 mm/day during the months May-August. The average total amount of evapotranspiration per year is about 1800-1900 mm/year.

growing period

The first growing period for zone 9 is a short growing period, which does not develop in most years. The second growing period is moderately reliable. The first marginal growing period of 20 days starts around May 1 and ends May 20.

The second marginal growing period of 50 days starts August 20 and ends October 10. The second growing period does not develop in 1 year out of 4. The dry interval between the two growing periods lasts 90 days (Figure 3.41).

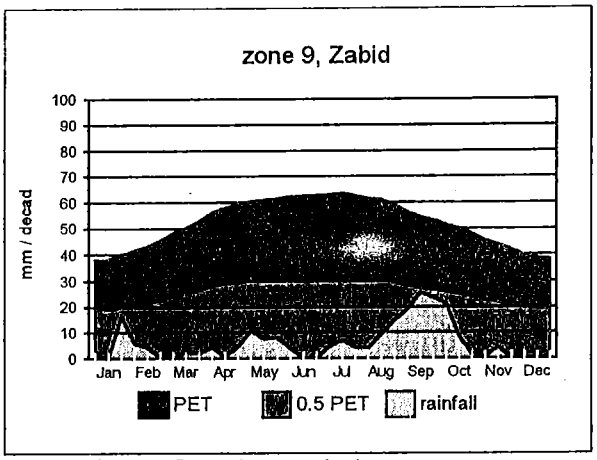


Figure 3.41: Growing period

The rainfall amount (P) for an average year during the first growing period is about 40 mm, while the potential evapotranspiration (PET) for an average year is about 100 mm, resulting in a P/PET ratio of 0.4. During the second growing period the rainfall amount (P) for an average year is about 120 mm, while the potential evapotranspiration (PET) for an average year is about 275 mm, resulting in a P/PET ratio of 0.4.

During wet years the second growing period can last until the end of October. During dry years the second growing period does not develop.

Water harvesting has little influence on the length of growing period in this zone. With a terrace factor of 1 both growing periods are extended with a maximum of ten days.

temperatures (Figure 3.42)

Altitude differences in this zone are limited (100-200 m).

The mean monthly maximum temperature varies between 30°C during the cool months of November through January and 38°C during the warm months of June-August. The mean monthly minimum temperature varies between 19.5°C during the cool months and 27.5°C during the warm months of June-August.

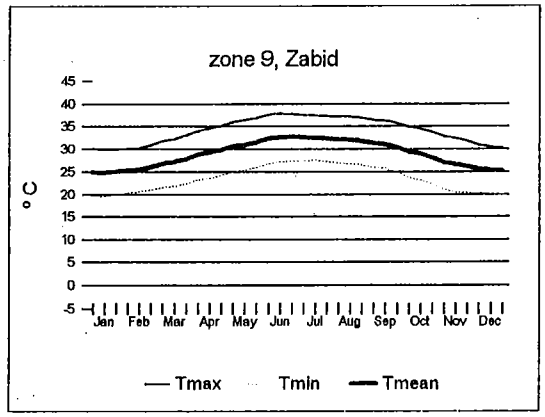


Figure 3.42: Temperatures

During the second growing period the mean daily temperature varies between 29 and 32°C.

relative humidity (Figure 3.43)

The average mean relative humidity in zone 9 varies little. The average mean relative humidity varies between 60 %

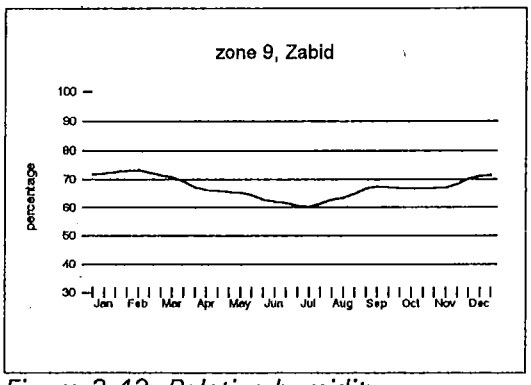


Figure 3.43: Relative humidity

during the warm months and 70 % during the cool months.

sunshine and radiation (Figure 3.44)

The average number of sunshine hours varies little over the year (7.5-9.5 hours/day).

This results in a net short-wave solar radiation (Rns) of 17.5-19 MJ/m²/day during April-June and 14-15 MJ/m²/day during December-February.

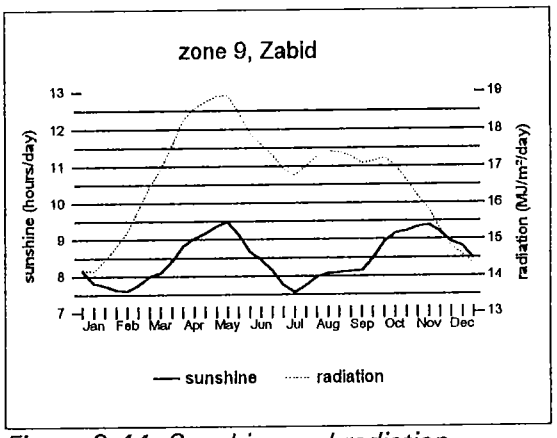


Figure 3.44: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded in zone 9. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and closer to the average air temperature during the months when the soil is wet (August/September). The expected lowest soil temperature would then be around 27°C during the cool period, and the expected highest 34°C during the month of June. The yearly average soil temperature is expected to be about 31°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic.**

soil moisture regime

Zone 9 is flat to undulating. Some water harvesting is practiced, but the amount of water collected is limited. Without taking water harvesting into consideration, the soil moisture regime for zone 9 according to the Soil Taxonomy (1994) is **aridic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 8 is classified as **weak/typic aridic:**

in 10 years out of 20 the soil is weak aridic
and, in 10 years out of 20 the soil is typic aridic.

Water harvesting has little impact on the soil water content. With a terrace factor of 1, the soil moisture regime according to the Soil Taxonomy (1994) is still **aridic** in zone 9. According to Van Wambeke (1982) the soil moisture regime becomes **weak aridic.**

3.10 Zone 10

location

Zone 10 consists of parts of the southern plateau and slopes. The extend of the zone is about 13600 km².

The representative agro-meteorological station for zone 10 are Moudia at 800 m altitude, Habilin at 600 m altitude and Mukiras at 2150 m altitude. Musaimer at 600 m altitude, Madram at 450 m altitude and Karish at 750 m altitude are representative rainfall stations. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two rainy seasons, separated by a relatively dry interval (mid June / mid July). The zone can be subdivided into three sub-zones, depending on the amount of rainfall.

In zone 10a (Musaimer and Moudia) the annual rainfall generally varies between 175 and 400 mm, with some years having rainfall amounts exceeding 600 mm. The first rainy period is erratic. It starts in April / May and ends at the end of May, but is absent in about fifty percent of the years. The second rainy period begins end of July / beginning of August and lasts until the end of September.

In zone 10b (Mukiras) the annual rainfall generally varies between 175 and 325 mm, with dry years having rainfall amounts below 100 mm. The first rainy period seldom develops well. The second rainy period begins end of July / beginning of August and lasts until end of September.

In zone 10c (Habilin, Madram and Karish) the annual rainfall generally varies between 100 and 250 mm, with some years having rainfall amounts over 350 mm. The first rainy period is unreliable. It starts mid May and ends mid June, but is absent in fifty percent of the years. The second rainy period begins end July and lasts until end of September, but often has a dry spell in August.

In the whole zone the months November through January are generally dry. During the months February and March occasional thunderstorms can bring a substantial amount of rain.

Sixty to seventy-five percent of the rain falls during the months July-December.

potential evapotranspiration

In the zones 10a and 10c the potential evapotranspiration is about 3-4 mm/day during the dry, cool period and 4.5-6 mm/day during the months May-June. The average total amount of evapotranspiration per year is about 1800-1900 mm/year.

In zone 10b, located at higher altitudes, the potential evapotranspiration is about 2.5-3 mm/day during the dry, cool period and 4.5 mm/day during the month of June. The average total amount of evapotranspiration is about 1400 mm/year.

growing period

Both growing periods for zone 10 are unreliable.

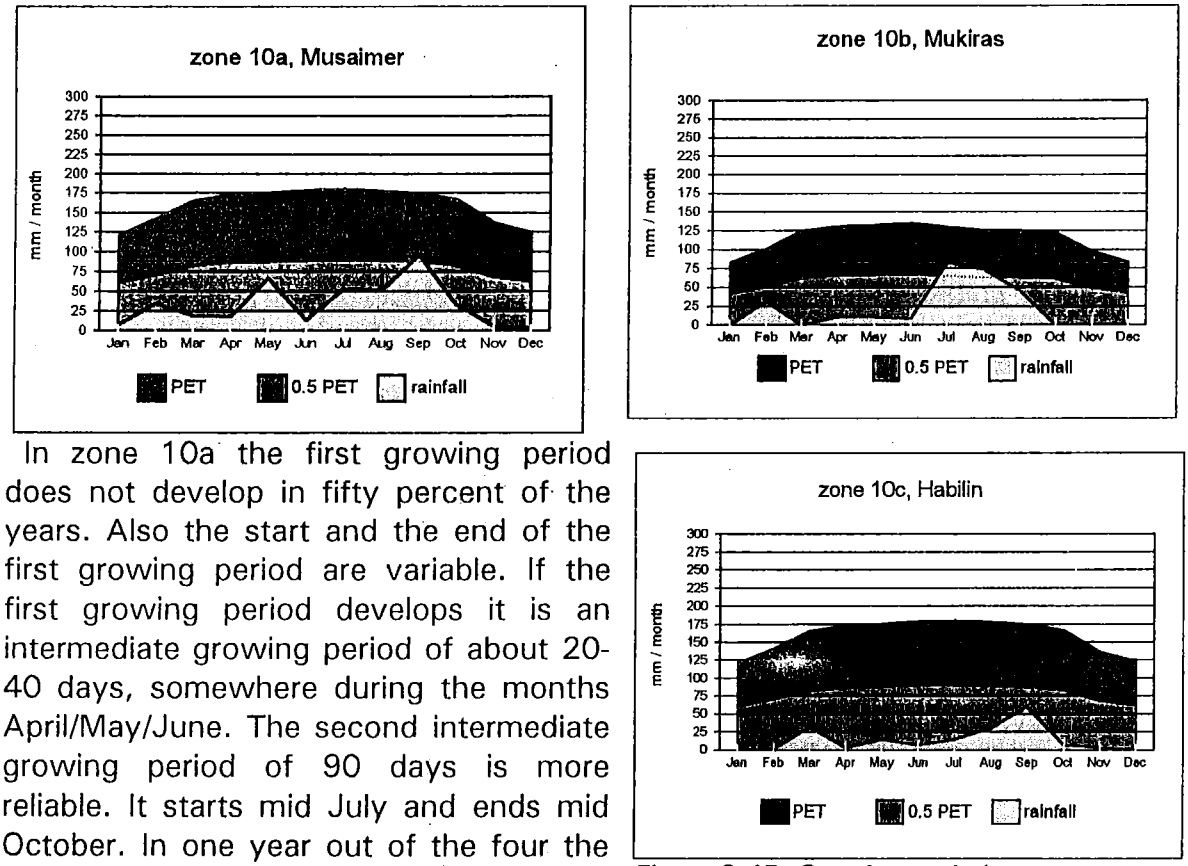


Figure 3.45: Growing period

In zone 10a the first growing period does not develop in fifty percent of the years. Also the start and the end of the first growing period are variable. If the first growing period develops it is an intermediate growing period of about 20-40 days, somewhere during the months April/May/June. The second intermediate growing period of 90 days is more reliable. It starts mid July and ends mid October. In one year out of the four the second growing period does not develop (Figure 3.45a).

In zone 10b the first growing period seldom develops. The second intermediate growing period of about 90 days is more reliable. It starts mid July and ends mid October. In one year out of three the second growing period does not develop (Figure 3.45b).

In zone 10c the first growing period seldom develops. The second marginal growing period of about 90 days develops in one year out of two. August is often a relatively dry month during the second growing period (Figure 3.45c).

In zone 10a the rainfall amount (P) for an average year during the first growing period is about 50-150 mm, while the potential evapotranspiration (PET) for an average year is about 105-210 mm, resulting in a P/PET ratio of 0.5-0.7. In the zones 10a and 10b the rainfall amount (P) for an average year during the second growing period is about 200 mm, while the potential evapotranspiration (PET) for

an average year is about 480 mm for zone 10a and 390 mm for zone 10b, resulting in a P/PET ratio of 0.4 for zone 10a and 0.5 for zone 10b. In zone 10c the rainfall amount (P) for an average year during the second growing period is about 150 mm, while the potential evapotranspiration (PET) for an average year is about 500, resulting in a P/PET ratio of about 0.3.

During wet years the first growing period is well developed, while during dry years the first growing period and/or the second growing period do not develop.

Water harvesting has little influence on the length of growing period in this zone. With a terrace factor of 1 both growing periods are extended with a maximum of ten days.

temperatures (Figure 3.46)

The temperatures are dominantly controlled by the altitude. For every 100 meters rise in altitude, the mean annual maximum temperature decreases 0.63°C (0.6°C during the winter months and 0.75°C during the wet period), while the mean annual minimum temperature decreases 0.7°C and the mean annual temperature decreases 0.63°C.

In the zone 10a and 10c the mean monthly maximum temperature varies between 26-28°C during the cool months of November through January and 35-37.5°C during the warm months of June-August. The mean monthly minimum temperature varies between 16-19°C during the cool months and 25-27°C during the warm months of June-August.

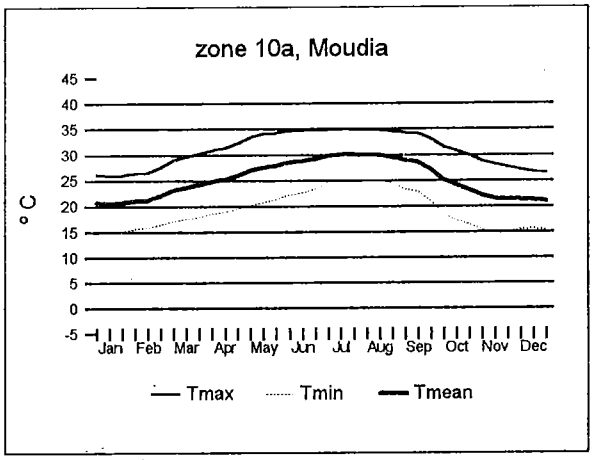


Figure 3.46: Temperatures

In zone 10b the mean monthly maximum temperature varies between 18-20°C during the cool months of November through January and 29°C during the warm months of June-August. The mean monthly minimum temperature varies between 6.5-8°C during the cool months and 15-16°C during the warm months of June-August.

In zone 10b the temperature drops below 0°C for less 10 days per year during the months December and January.

During the second growing period the mean daily temperature varies between 30 and 33°C for the zones 10a and 10c, and between 17 and 20°C in zone 10b.

relative humidity (Figure 3.47)

The mean daily relative humidity in zone 10 varies little over the year. The mean daily relative humidity varies between 45-60 %, with highest humidities during the cool months and during the wet period.

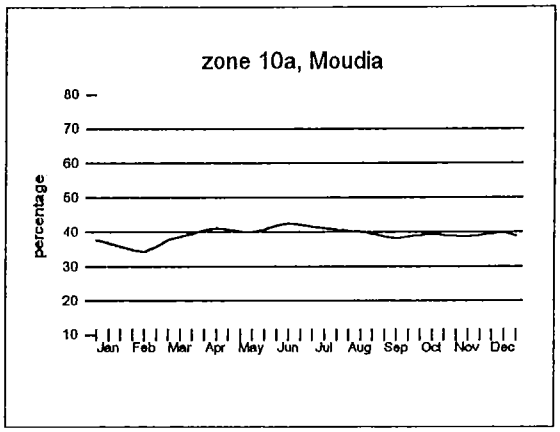


Figure 3.47: Relative humidity

sunshine and radiation (Figure 3.48)

The average number of sunshine hours is highest during the months February and October (10-11 hours per day). During the rest of the year the number of sunshine hours is about 7.5-9 hours/day.

This results in a net short-wave solar radiation (Rns) of 19 MJ/m²/day during March and October, 14 MJ/m²/day during the winter months, while during the remainder of the year the Rns varies between 16 and 17 MJ/m²/day.

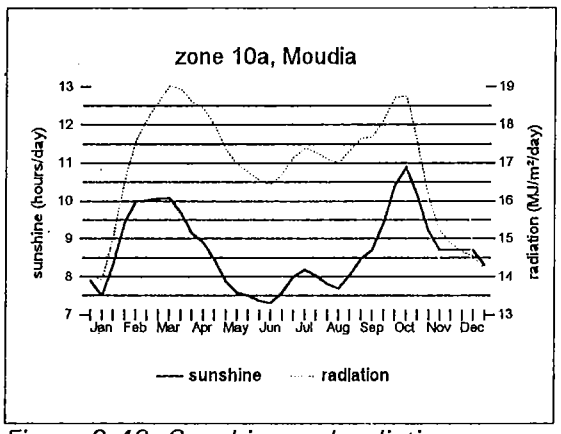


Figure 3.48: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded in zone 10. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and closer to the average air temperature during the months when the soil is wet (August/September).

In the zones 10a and 10c the expected lowest soil temperature would then be around 23°C during the cool period, and the expected highest 33°C during the month of June. The yearly average soil temperature is expected to be about 28°C.

In zones 10b the expected lowest soil temperature would then be around 16°C during the cool period, and the expected highest 26°C during the month of June. The yearly average soil temperature is expected to be about 20°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic** in the zones 10a and 10c and **Thermic** in zone 10b (above 1800 m altitude).

soil moisture regime

Water harvesting is practiced, but the amount of water collected is limited. Without taking water harvesting into consideration, the soil moisture regime for zone 10 according to the Soil Taxonomy (1994) is **aridic**. According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 10 is classified as **weak aridic**:

in 13 years out of 18 the soil is weak aridic
and, in 5 years out of 18 the soil is typic aridic.

Water harvesting has little impact on the soil water content. With a terrace factor of 1, the soil moisture regime according to the Soil Taxonomy (1994) is still **aridic** in zone 10. According to Van Wambeke (1982) the soil moisture regime remains **weak aridic**.

3.11 Zone 11

location

Zone 11 is located in the eastern part of the country. The extend of the zone is about 186000 km².

The representative agro-meteorological stations for zone 11 are Seiyun (700 m), Marib (1100 m), Beihan (1150 m) and Nuqub (1050 m). See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there is no distinct rainy season. The annual rainfall generally varies between 50 and 125 mm (Figure 3.49). The months October through January and June are generally dry, although an occasional thunderstorm can bring some rain during these months.

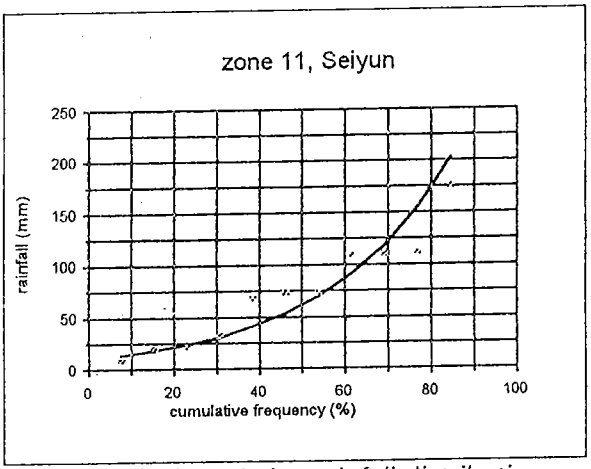


Figure 3.49: Cumulative rainfall distribution

Eighty percent of the rains generally falls from January through June. The number of raindays with rainfall amounts above 5 mm/day varies between 2-8 days.

potential evapotranspiration

The potential evapotranspiration is about 3-3.5 mm/day during the cool period and 6-6.5 mm/day during the months June-July. The average total amount of evapotranspiration per year is about 1650-1800 mm/year.

growing period

There is no distinct growing period (Figure 3.50).

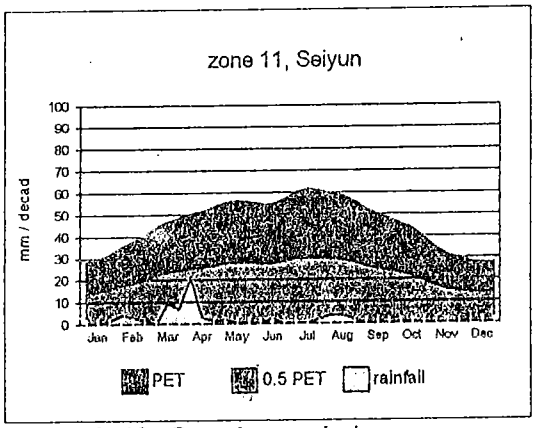


Figure 3.50: Growing period

temperatures (Figure 3.51)

Altitude differences in this zone are limited (700-1100 m). The mean monthly maximum temperature varies between 27-31°C during the cool months of November through January and 40-42°C during the hot months of June-August. The mean monthly minimum temperature varies between 9-11°C during the cool months and 22-25°C during the hot months of June-August.

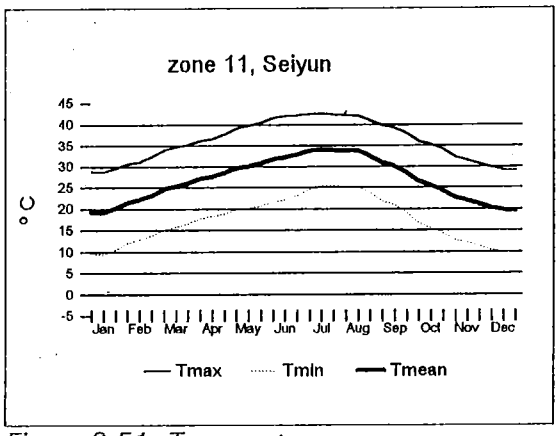


Figure 3.51: Temperatures

relative humidity (Figure 3.52)

The mean daily relative humidity in zone 11 varies according to the seasons. During the cool season the mean daily relative humidity varies between 40 and 50 %, while during the hot season the mean daily relative humidity varies between 20 and 35%.

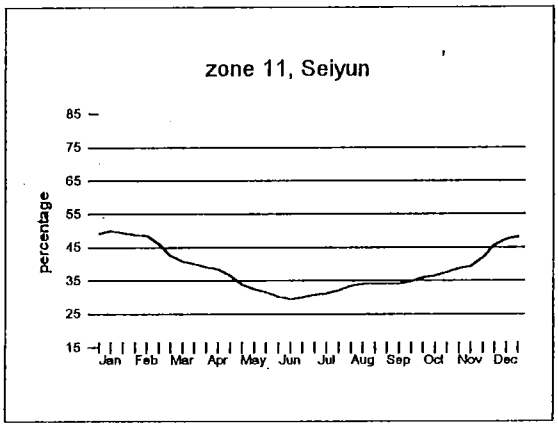


Figure 3.52: Relative humidity

sunshine and radiation (Figure 3.53)

The average number of sunshine hours varies little over the year (8.5-10.5 hours/day), and is highest during the months May and October/November.

This results in a net short-wave solar radiation (Rns) of 17.5-18.5 MJ/m²/day during May/June and 13.5-14.5 MJ/m²/day during December and January.

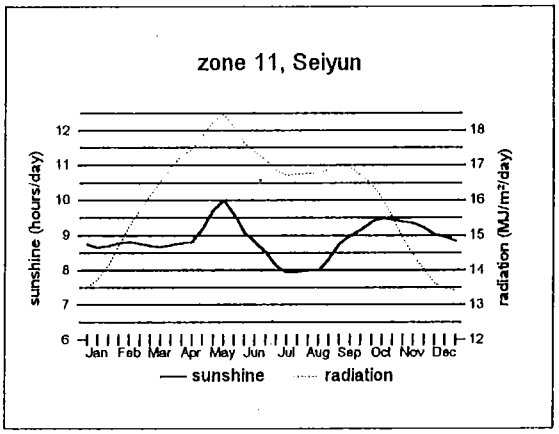


Figure 3.53: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 11. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature. The expected lowest soil temperature would then be around 24°C during the cool period, and the expected highest 37°C during the month of June. The yearly average soil temperature is expected to be about 31°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic**.

soil moisture regime

The soil moisture regime for zone 11 according to the Soil Taxonomy (1994) is **aridic**. According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 11 is classified as **typic aridic.** No water harvesting is practiced.

3.12 Zone 12

location

Zone 12 is located along the western and southern coasts. The extend of the zone is about 40000 km².

The representative agro-meteorological stations for zone 12 are Al Kod (20 m), Riyan (25 m), Lahej (130 m), Giar (100 m) and Fiyush (65 m) in the south and Hodeidah (10 m) in the west. Mokha (5 m) in the west is a representative rainfall station. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there is no distinct rainy season. The annual rainfall generally varies between 10 and 200 mm (Figure 3.54). The months October through January and June are generally dry, although an occasional thunderstorm can bring some rain during these months. The number of raindays with rainfall amounts above 5 mm/day varies between 0-10 days.

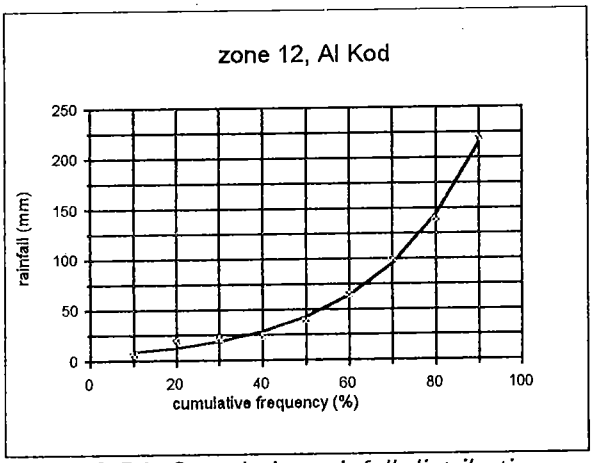


Figure 3.54: Cumulative rainfall distribution

potential evapotranspiration

The potential evapotranspiration is about 3-4 mm/day during the cool period and 4.5-5 mm/day during the months May-June. The average total amount of evapotranspiration per year is about 1400-1600 mm/year.

growing period

There is no distinct growing period (Figure 3.55).

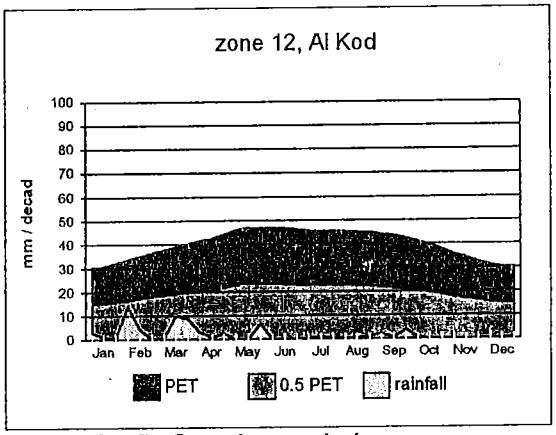


Figure 3.55: Growing period

temperatures (Figure 3.56)

Altitude differences in this zone are limited (0-200 m). The mean monthly maximum temperature varies between 29-31°C during the cool months of November through January and 34-36°C during the warm months of June-August. The mean monthly minimum temperature varies between 19-21°C during the cool months and 27-29°C during the warm months of June-August.

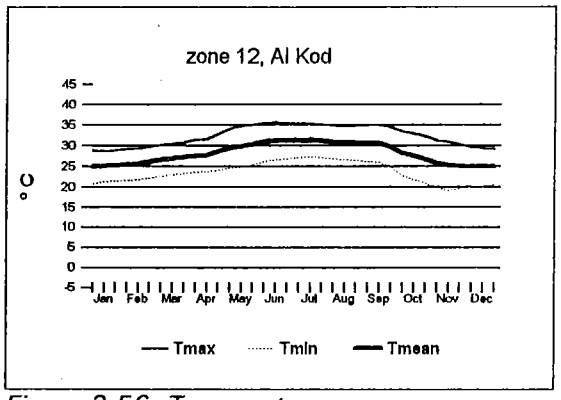


Figure 3.56: Temperatures

relative humidity (Figure 3.57)

The average mean relative humidity in zone 12 varies little. The average mean relative humidity varies between 70 and 80 % close to the sea, and between 60 and 70 % more land-inward.

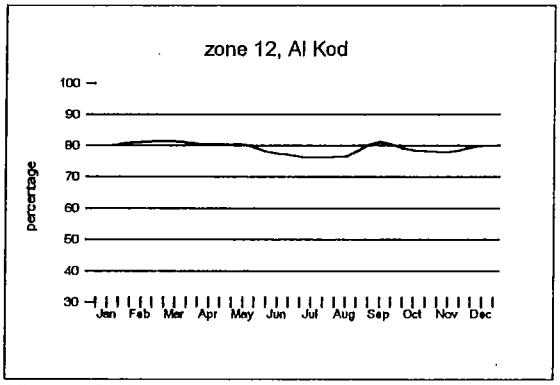


Figure 3.57: Relative humidity

sunshine and radiation (Figure 3.58)

The average number of sunshine hours varies little over the year (8.5-10 hours/day). It is highest during the months of May and October-November (10 hours/day).

This results in a net short-wave solar radiation (Rns) of 16-16.5 MJ/m²/day during May/June and 12.5-13 MJ/m²/day during December-February.

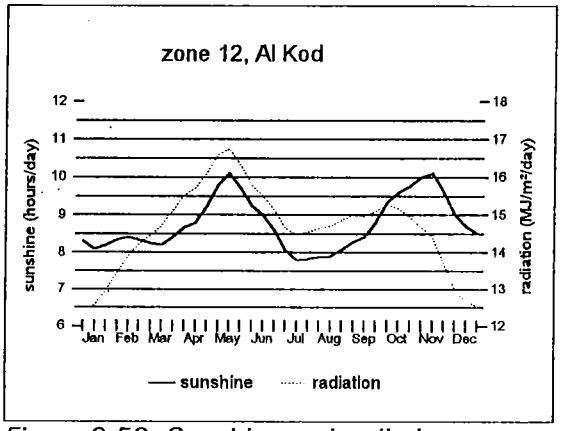


Figure 3.58: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 12. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature. The expected lowest soil temperature would then be around 27°C during the cool period, and the expected highest 34°C during the summer. The yearly average soil temperature is expected to be about 31°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic**.

soil moisture regime

The soil moisture regime for zone 12 according to the Soil Taxonomy (1994) is **aridic**. According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 12 is classified as **typic aridic.**

3.13 Zone 13

location

Zone 13 consists of the Ramlat as Saba'tayn and the northern part of the Hadramaut. The extend of the zone is about 108000 km².

The representative agro-meteorological station for zone 13 is Al Jowf at 1100 m altitude. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there is no distinct rainy season. The annual rainfall is less than 100 mm (Figure 3.59). The number of raindays with rainfall amounts above 5 mm/day is less than 5 days.

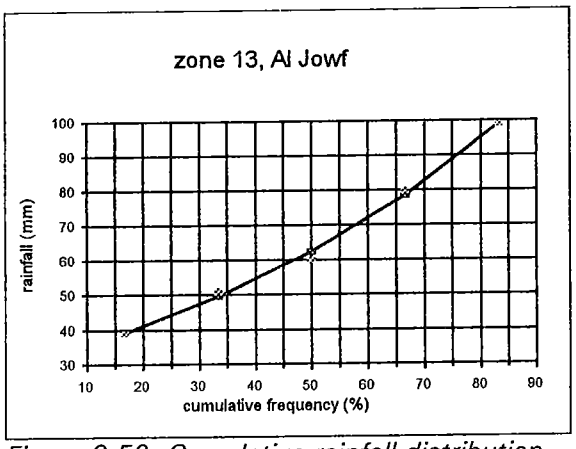


Figure 3.59: Cumulative rainfall distribution

potential evapotranspiration

The potential evapotranspiration is about 3.5-4 mm/day during the cool period and 7-8 mm/day during the months June/July. The average total amount of evapotranspiration per year is about 2000 mm/year.

growing period

There is no distinct growing period in zone 13 (Figure 3.60).

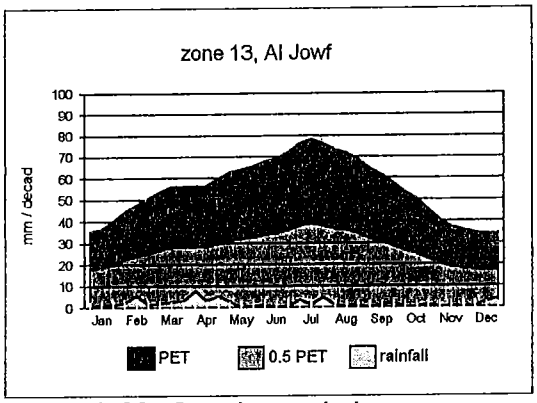


Figure 3.60: Growing period

temperatures (Figure 3.61)

Altitude differences in this zone are limited (800-1100 m).

The mean monthly maximum temperature varies between 27.5-29°C during the cool months of November through January and 40-41°C during the warm months of June-August. The mean monthly minimum temperature varies between 11°C during the cool months and 25°C during the warm months of June-August.

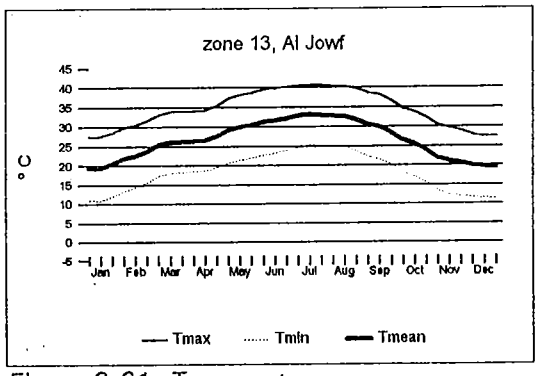


Figure 3.61: Temperatures

relative humidity (Figure 3.62)

The mean daily relative humidity in zone 13 varies according to the seasons. During the cool period the mean daily relative humidity is about 20 - 30 %, while during the hot period the mean daily relative humidity drops below 20 %.

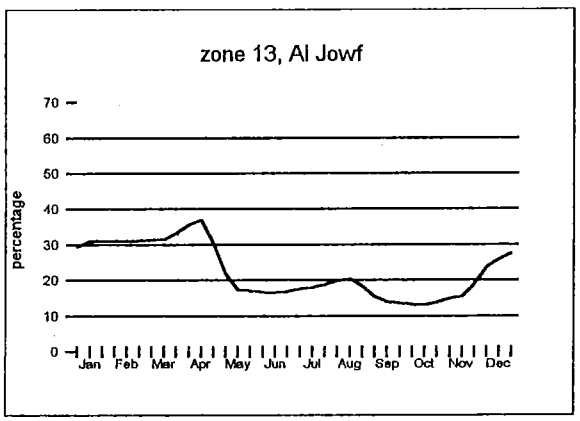


Figure 3.62: Relative humidity

sunshine and radiation (Figure 3.63)

The average number of sunshine hours is lowest in July/August (7-8 hours per day). The rest of the year the number of sunshine hours is between 9 and 10.5.

This results in a net short-wave solar radiation (Rns) of 14.5 MJ/m²/day during December/January and 18.5 MJ/m²/day during May/June.

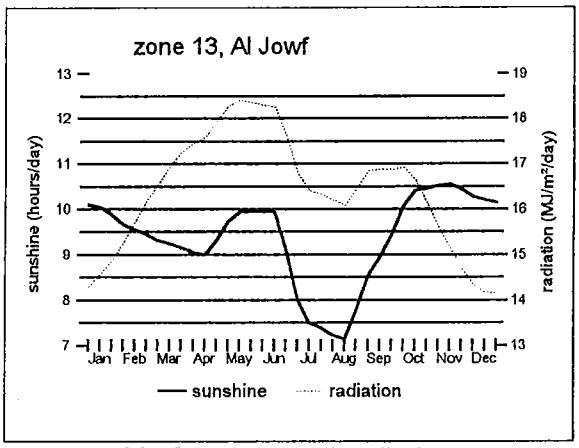


Figure 3.63: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded for 50 cm depth in zone 13. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months, and closer to the average air temperature during the months when the soil is wet (August/September). The expected lowest soil temperature would then be around 23°C during the cool period, and the expected highest 36°C during the month of June. The yearly average soil temperature is expected to be about 30°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic.**

soil moisture regime

The soil moisture regime for zone 13 according to the Soil Taxonomy (1994) is **aridic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 13 is classified as **extreme aridic.**

3.14 Zone 14

location

Zone 14 consists of Socotra. The extend of the zone is about 3700 km².

The representative agro-meteorological station for zone 14 is Socotra. See Annex 1 for a summary of relevant agro-climatic data.

rainfall

In this zone there are two rainy seasons, separated by a distinct dry interval (July/August). The annual rainfall generally varies between 50 and 200 mm (Figure 3.64).

The first rainy period (May/June) is unreliable, the second rainy period (October-November) is somewhat more reliable.

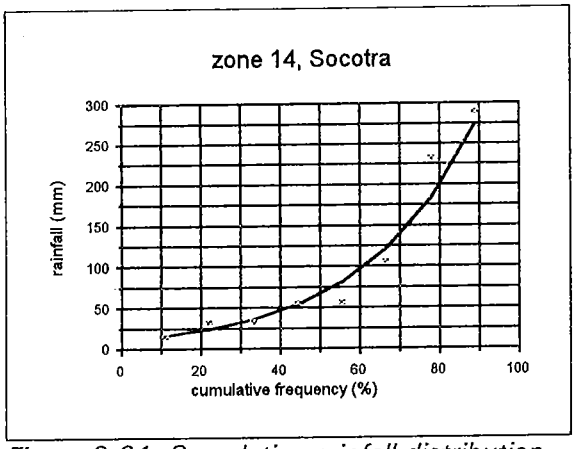


Figure 3.64: Cumulative rainfall distribution

potential evapotranspiration

The potential evapotranspiration varies between 3.5 mm/day during the cool period and 6.5-7.5 mm/day during the months June-August. The average total amount of evapotranspiration per year is about 1750 mm/year.

growing period

Both growing periods for zone 14 are unreliable. The first growing period does not develop in fifty percent of the years. Also the start and the end of the first growing period are variable. If the first growing period develops, it is an intermediate growing period of twenty to forty days, somewhere during the months April/May/June. The second growing period also does not develop in fifty percent of the years, and the length is variable from 30 to 60 days. The start of the second intermediate growing period is around end of September / October, while the growing period ends in November (Figure 3.65).

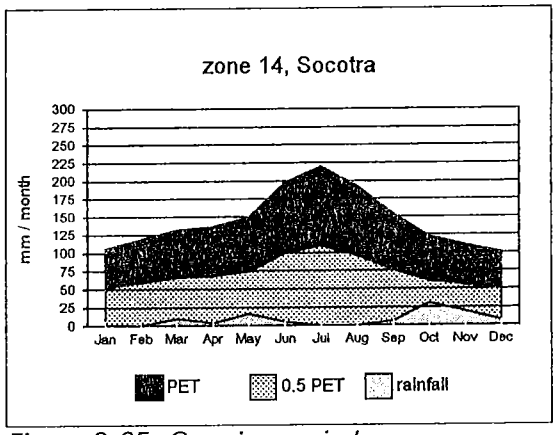


Figure 3.65: Growing period

During the first growing period the rainfall amount (P) for an average year in which the growing period develops is about 50-100 mm, while the potential evapotranspiration (PET) is about 90-180 mm, resulting in a P/PET ratio of 0.6.

During the second growing period the rainfall amount for an average year in which the growing period develops is about 60-150 mm, while the PET is about 120-220 mm, resulting in a P/PET ratio of 0.5-0.7.

temperatures (Figure 3.66)

The mean monthly maximum temperature varies between 29°C during the cool months of November through January and 36°C during the warm months of June. The mean monthly minimum temperature varies between 26°C during the cool months and 33.5°C during the warm months of June.

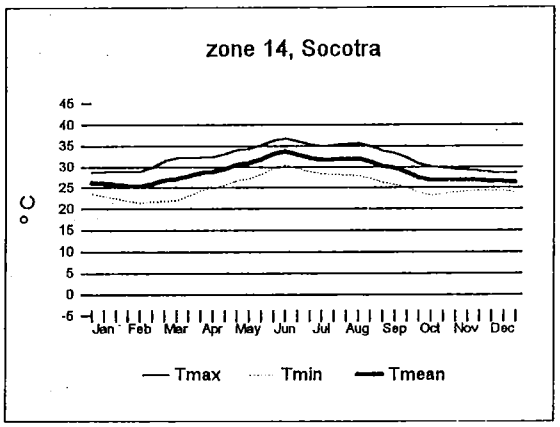


Figure 3.66: Temperatures

During the second growing period the mean daily temperature is around 24°C. At higher altitudes the temperatures will be lower.

relative humidity (Figure 3.67)

The mean daily relative humidity in zone 14 varies between 45-55 % during the hot, dry months of June through August and 70 % during October and November.

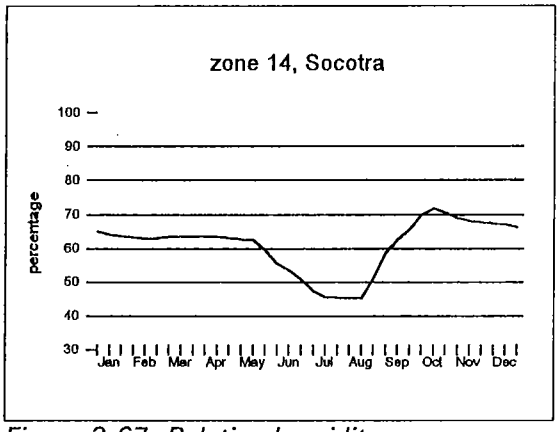


Figure 3.67: Relative humidity

sunshine and radiation (Figure 3.68)

The average number of sunshine hours varies is lowest during the months December and January (7 hours/day), while during the remainder of the year the number of sunshine hours varies between 8 and 10 hours per day.

This results in a net short-wave solar radiation (Rns) of 11-12 MJ/m²/day during December/January and 14-16 MJ/m²/day during the rest of the year.

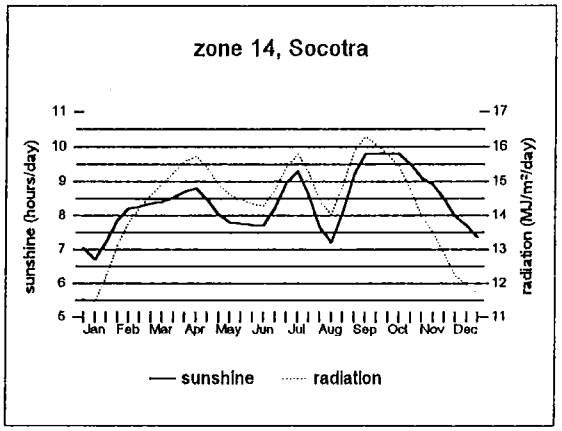


Figure 3.68: Sunshine and radiation

soil temperature regime

No soil temperature data have been recorded in zone 14. It is assumed that the soil temperature at 50 cm depth is between the average and the maximum air temperature during the dry months,

and closer to the average air temperature during the months when the soil is wet (October/November). The expected lowest soil temperature would then be around 27°C during the cool period, and the expected highest 35°C during the month of June. The yearly average soil temperature is expected to be about 30°C.

According to Soil Taxonomy (1994) the soil temperature would be **Hyperthermic.**

soil moisture regime

The soil moisture regime for zone 14 according to the Soil Taxonomy (1994) is **aridic.** According to the modifications proposed by Van Wambeke (1982) the soil moisture regime for zone 14 is classified as **typic aridic.**

Chapter 4
Conclusions and recommendations

4.1 Conclusions

From the total study area in Yemen (about 42 million ha) less than 250 thousand ha (zones 1 and 2) receives enough rainfall over a sufficient long period to sustain cropping under rainfed conditions for a wide variety of crops.

Another 1250 thousand ha of land has similar cropping conditions grace to terracing (zone 3). However, not the total 1250 thousand ha is available for cropping, as tracts of land are too steep, too shallow or too stony to be cultivated. An estimated 750 thousand ha in this zone is suitable for cropping.

About 2100 thousand ha land has a marginal cropping suitability (zones 4, 8 and 10). The growing period(s) are relatively short, approximately 90 days and the rainfall is moderately reliable.

The intermontane plains (about 600 thousand ha) receive generally insufficient rain to support rainfed cropping. Supplementary irrigation is a necessity during most years.

Part of the mountain area (zone 5) and the Tihama (zone 9) receive in some years enough rainfall to grow a short season crop, but the growing period is not reliable.

The rest of the country does not receive sufficient rain to support rainfed cropping.

The temperatures are the whole year round favorable for cropping, although at high altitudes frost may be restricting the growth of several crops during the cold season, while at low altitudes and in the arid interior high maximum temperatures may restrict the growth of several crops during the hot season.

4.2 Recommendations

. The collection of agro-climatic data and the supervision and maintenance of the agroclimatic and rainfall stations should be coordinated between the various authorities.

Some new agro-climatic stations should be installed in those areas not covered by the present stations and some rainfall stations should be upgraded to agro-climatic stations. Agro-climatic stations are needed in the following zones (see for the locations Map 1, rainfall and meteostations):

zone 3: new stations in Utmah, Manakha, west of Sa'ada;
zone 4: new station south-west of Taiz;

zone 5: upgrade Habaka and Al Masna'ah, new stations east of Sana'a and in the northern highlands;
zone 11: new station on plateau east of Mukalla.

Agricultural research should focus its attention on the following zones and agricultural systems:

zones 1 and 2: rainfed agriculture with annuals and perennials
below 2000 m
above 2000 m;
zone 3: rainfed agriculture relying on water harvesting
below 2000 m
above 2000 m;
zones 4, 8 and 10: rainfed agriculture (marginal water supply)
below 1000 m
above 1000 m;
zones 6 and 7: rainfed agriculture with supplementary irrigation and irrigated agriculture;
other zones: irrigated agriculture
coastal areas
inland

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Annex I

Agro-meteorological and rainfall stations

Annex I Agro-meteorological and rainfall stations

zone 1
- I.1 Ibb

zone 2
- I.2 Al Udein
- I.3 Sumara
- I.4 Yarim/Kitab

zone 3
- I.5 Hajja
- I.6 Hammam Ali
- I.7 Mahweet
- I.8 Shibam
- I.9 Thula
- I.10 Rhihab

zone 4
- I.11 Taiz (Osiferah)
- I.12 Taiz (airport)
- I.13 Warazan
- I.14 Dhala

zone 5
- I.15 Al Sanam
- I.16 Al Masna'ah
- I.17 Habaka

zone 6
- I.18 Dhamar
- I.19 Risaba
- I.20 Al Janat
- I.21 Rayda
- I.22 Mengida

zone 7
- I.23 Rada
- I.24 Sana'a
- I.25 Al Irra
- I.26 Sa'ada
- I.27 Dumeid

zone 8
- I.28 Gerba
- I.29 Al Dimnah
- I.30 Al Jaruba

zone 9
- I.31 Zabid
- I.32 As Zuhra
- I.33 Al Khalifah
- I.34 Al Mahatt
- I.35 Ad Dahi

zone 10
- I.36 Moudia
- I.37 Musaimer
- I.38 Mukiras
- I.39 Habilin
- I.40 Madram
- I.41 Karish

zone 11
- I.42 Seiyun
- I.43 Marib
- I.44 Beihan
- I.45 Nuqub

zone 12
- I.46 Al Kod
- I.47 Riyan
- I.48 Lahej
- I.49 Giar
- I.50 Fiyush
- I.51 Hodeidah
- I.52 Mokha

zone 13
- I.53 Al Jowf

zone 14
- I.54 Socotra

station: Al Udein
latitude: 14°01'
longitude: 44°00'
altitude: 1500 m

rainfall
average 1975, 1977-1980, 1982-1986

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)										
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1977	1978	1979	1980	1982	1983	1984	1985	1986
	dec-1	26.7	10.7	18.7	65	8.4	13.7	1.5	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	26.3	10.4	18.4	66	8.1	13.6	1.5	3.2	32	1.2	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	26.8	11.2	19.0	65	8.2	14.0	1.6	3.4	34	2.4	23.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	27.5	12.2	19.8	63	8.3	14.5	1.6	3.7	37	5.3	4.1	0.0	0.0	0.0	0.0	0.0	49.0	0.0	0.0	0.0
Feb	dec-5	27.9	12.6	20.2	63	8.3	15.0	1.6	3.9	39	4.6	11.3	0.0	0.0	0.0	0.0	0.0	35.0	0.0	0.0	0.0
	dec-6	28.5	13.1	20.8	62	8.3	15.4	1.6	4.1	41	1.6	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-7	29.5	13.7	21.6	61	8.3	15.7	1.7	4.3	43	9.5	0.0	0.0	0.0	0.0	0.0	95.0	0.0	0.0	0.0	0.0
Mar	dec-8	29.9	14.0	22.0	60	8.3	16.0	1.7	4.4	44	15.1	47.2	0.0	11.2	0.0	10.0	25.0	0.0	0.0	0.0	58.0
	dec-9	30.1	14.5	22.3	60	8.4	16.3	1.7	4.5	45	13.9	44.1	0.0	13.0	49.0	0.0	0.0	0.0	0.0	28.0	5.0
	dec-10	30.2	15.2	22.7	60	8.5	16.7	1.7	4.7	47	28.4	16.5	46.0	25.0	0.0	37.0	40.0	61.0	0.0	42.0	16.8
Apr	dec-11	30.3	15.5	22.9	59	8.6	16.8	1.7	4.7	47	26.7	9.4	0.0	7.3	0.0	59.0	64.0	87.0	0.0	20.0	20.5
	dec-12	31.0	16.1	23.5	58	8.6	16.8	1.6	4.8	48	24.4	34.1	28.0	5.3	0.0	16.0	0.0	52.0	52.0	23.0	34.0
	dec-13	31.8	16.8	24.3	57	8.6	16.6	1.6	4.9	49	45.2	15.0	77.5	13.0	38.0	39.0	8.0	22.0	136.6	26.0	77.0
May	dec-14	32.3	17.2	24.7	57	8.5	16.5	1.6	4.9	49	28.0	35.8	39.5	41.9	14.0	34.0	23.0	30.0	40.6	21.0	0.0
	dec-15	32.7	17.1	24.9	57	8.4	16.2	1.6	4.8	48	54.2	51.3	43.3	12.3	21.0	68.0	8.0	129.0	147.0	39.0	23.0
	dec-16	33.2	16.9	25.1	56	8.3	15.9	1.6	4.8	48	30.4	12.1	12.0	96.6	0.0	0.0	23.0	48.0	41.3	17.0	54.0
Jun	dec-17	33.4	16.9	25.1	56	8.2	15.8	1.6	4.8	48	27.0	14.0	8.0	7.0	80.0	30.0	41.0	18.0	12.5	32.0	27.0
	dec-18	33.0	17.2	25.1	59	7.8	15.0	1.6	4.6	46	37.4	17.0	60.7	19.0	27.0	21.0	45.0	74.0	23.0	46.0	41.0
	dec-19	32.4	17.8	25.1	62	7.2	14.1	1.6	4.3	43	44.2	29.6	81.3	17.0	9.0	62.0	25.0	43.0	109.8	50.0	15.0
Jul	dec-20	32.1	18.0	25.1	63	6.9	13.7	1.6	4.2	42	44.5	19.0	28.3	126.0	66.0	62.0	56.0	0.0	60.5	19.0	8.0
	dec-21	32.1	18.1	25.1	64	7.0	13.9	1.5	4.2	42	44.5	71.4	16.3	48.3	30.0	59.0	55.0	69.0	27.4	38.0	31.0
	dec-22	32.2	18.2	25.2	65	7.1	14.2	1.4	4.2	42	37.8	60.2	56.3	9.0	41.0	93.0	11.0	0.0	6.0	48.0	53.0
Aug	dec-23	32.3	18.2	25.3	66	7.1	14.3	1.4	4.2	42	55.2	72.3	45.0	39.0	92.8	30.0	97.0	32.0	42.0	49.0	53.0
	dec-24	32.2	17.6	24.9	64	7.4	14.7	1.3	4.2	42	47.1	55.7	42.2	52.8	76.8	47.5	54.0	47.0	47.4	0.0	48.0
	dec-25	32.1	16.8	24.4	62	7.7	15.1	1.3	4.3	43	40.3	17.0	29.3	57.0	26.0	18.0	66.0	72.0	45.5	72.0	0.0
Sep	dec-26	32.0	16.4	24.2	61	7.8	15.2	1.3	4.3	43	20.0	15.1	0.0	50.3	35.5	28.3	14.0	8.0	16.7	0.0	32.0
	dec-27	31.7	15.3	23.5	60	8.2	15.7	1.4	4.3	43	19.2	0.0	9.0	25.4	100.0	0.0	0.0	45.0	0.0	0.0	13.0
	dec-28	31.2	13.8	22.5	58	8.8	16.3	1.5	4.4	44	14.9	0.0	34.0	35.0	38.0	0.0	10.0	18.0	0.0	14.3	0.0
Oct	dec-29	31.0	13.0	22.0	57	9.1	16.4	1.6	4.4	44	15.2	0.0	0.0	28.0	0.0	17.0	40.0	0.0	0.0	0.0	67.0
	dec-30	30.3	12.3	21.3	57	9.1	16.0	1.6	4.2	42	20.9	0.0	184.8	19.3	0.0	5.0	0.0	0.0	0.0	0.0	0.0
	dec-31	29.4	11.4	20.4	57	9.1	15.6	1.6	4.0	40	12.1	0.0	40.3	31.0	5.0	45.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	28.9	11.0	19.9	57	9.1	15.2	1.5	3.8	38	10.6	15.0	18.0	25.0	0.0	0.0	14.0	0.0	0.0	34.0	0.0
	dec-33	28.4	11.1	19.7	59	9.1	14.8	1.5	3.7	37	9.4	0.0	0.0	0.0	0.0	41.0	53.0	0.0	0.0	0.0	0.0
	dec-34	27.8	11.2	19.5	61	9.0	14.5	1.5	3.5	35	7.4	0.0	0.0	22.5	0.0	0.0	51.0	0.0	0.0	0.0	0.0
Dec	dec-35	27.5	11.3	19.4	62	9.0	14.3	1.5	3.5	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	27.1	11.0	19.0	63	8.7	14.0	1.5	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		30.3	14.6	22.4	61	8.3	5486	1.5	4.2	1506	799	691	912	853	749	822	918	939	808	618	676
										P/PET	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.4

station: Ibb (agro-)meteorological
latitude: 13°57' average 1982-1992
longitude: 44°11'
altitude: 1900 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)											
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
	dec-1	24.1	6.5	15.3	66	8.6	14.0	1.1	2.9	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	24.1	6.8	15.4	66	8.5	14.1	1.1	2.9	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	24.3	7.4	15.8	67	8.5	14.4	1.2	3.1	31	6.4	0.0	55.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5
	dec-4	24.5	8.2	16.4	68	8.4	14.8	1.2	3.2	32	15.2	7.8	11.5	0.0	0.0	4.0	0.0	0.0	112.0	14.5	0.0	17.5
Feb	dec-5	24.7	8.6	16.6	69	8.4	15.2	1.2	3.3	33	3.0	3.3	0.0	0.0	0.0	27.8	0.0	0.0	2.0	0.0	0.0	0.0
	dec-6	25.1	9.1	17.1	68	8.3	15.4	1.2	3.5	35	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.1	3.6	0.0
	dec-7	25.7	9.8	17.8	66	8.2	15.6	1.2	3.6	36	12.6	56.1	0.0	0.0	0.0	5.3	37.2	4.5	11.0	0.0	24.0	0.0
Mar	dec-8	26.0	10.2	18.1	65	8.2	15.8	1.2	3.7	37	9.6	0.0	27.0	0.0	0.0	42.1	6.5	0.0	0.0	0.0	17.0	13.0
	dec-9	26.1	10.5	18.3	65	8.1	15.9	1.1	3.7	37	15.7	113.0	0.0	0.0	0.0	3.0	29.0	0.0	27.9	0.0	0.0	0.0
	dec-10	26.3	10.9	18.6	66	8.0	15.8	0.9	3.7	37	27.2	5.4	20.0	8.5	24.0	23.7	71.6	0.0	65.5	43.7	0.0	37.0
Apr	dec-11	26.4	11.1	18.7	67	7.9	15.7	0.8	3.7	37	14.5	6.5	59.1	0.0	3.5	14.9	22.2	43.0	0.0	10.0	0.0	0.0
	dec-12	26.9	11.3	19.1	66	7.9	15.7	0.8	3.7	37	35.2	19.0	126.5	21.7	7.0	3.0	0.0	52.0	64.0	5.5	49.2	38.9
	dec-13	27.6	11.6	19.6	66	7.9	15.5	0.7	3.7	37	32.0	2.5	0.0	65.4	21.1	27.0	36.1	0.0	16.6	30.8	127.7	25.0
May	dec-14	28.0	11.8	19.9	66	7.9	15.4	0.6	3.6	36	48.4	4.5	21.6	20.6	33.5	44.7	70.5	44.5	111.3	100.6	7.5	73.5
	dec-15	28.3	11.9	20.1	66	8.0	15.5	0.6	3.6	36	37.6	27.9	46.0	84.6	50.9	23.2	51.6	45.0	7.5	56.0	6.7	14.1
	dec-16	28.7	12.0	20.4	65	8.1	15.6	0.6	3.7	37	40.5	29.6	2.8	14.0	23.7	114.0	27.3	95.0	54.4	14.5	6.2	64.4
Jun	dec-17	28.9	12.1	20.5	65	8.2	15.6	0.6	3.7	37	49.4	88.0	22.1	28.2	0.0	73.9	47.8	51.1	79.2	75.8	52.1	24.7
	dec-18	28.4	12.4	20.4	68	7.5	14.6	0.6	3.5	35	40.4	31.3	64.3	17.5	118.5	11.6	35.3	20.3	17.6	42.0	26.2	59.8
	dec-19	27.7	12.8	20.3	71	6.6	13.2	0.6	3.2	32	58.4	61.0	4.0	147.2	19.0	42.4	38.0	51.9	52.9	30.0	72.2	123.9
Jul	dec-20	27.4	13.1	20.2	73	6.2	12.6	0.6	3.0	30	58.4	52.0	59.0	48.0	46.0	30.0	80.7	89.8	99.6	79.6	12.7	45.3
	dec-21	27.3	13.0	20.1	73	6.2	12.6	0.6	3.0	30	54.2	50.0	79.5	77.3	84.8	33.4	84.2	71.5	38.2	13.7	37.7	25.5
	dec-22	27.1	13.0	20.0	73	6.1	12.7	0.6	3.0	30	53.7	0.0	44.8	34.3	110.9	20.8	69.6	122.3	30.4	67.1	67.2	23.1
Aug	dec-23	27.0	13.0	20.0	73	6.1	12.7	0.6	3.0	30	37.3	0.0	3.0	40.3	30.2	37.5	56.8	75.0	57.2	30.7	15.0	64.4
	dec-24	27.1	12.2	19.6	72	6.6	13.4	0.5	3.1	31	66.9	37.1	68.1	55.8	57.6	130.2	40.6	61.0	97.1	104.6	36.2	48.0
	dec-25	27.2	11.1	19.1	71	7.1	14.2	0.4	3.2	32	54.3	5.0	64.5	73.3	43.1	46.8	34.0	79.4	97.6	43.7	42.3	67.4
Sep	dec-26	27.2	10.6	18.9	70	7.4	14.5	0.4	3.2	32	40.1	0.0	0.0	21.1	50.1	58.1	37.8	36.0	104.4	32.7	33.6	66.8
	dec-27	27.0	9.4	18.2	69	7.8	15.0	0.5	3.3	33	18.1	0.0	33.1	5.0	4.7	0.0	25.5	15.0	46.4	47.0	7.9	15.0
	dec-28	26.6	7.9	17.3	67	8.4	15.7	0.6	3.3	33	16.7	22.0	41.0	0.0	16.0	22.5	0.0	19.9	3.5	10.0	19.4	29.1
Oct	dec-29	26.4	7.1	16.8	66	8.7	15.8	0.6	3.3	33	3.8	0.0	0.0	0.0	0.0	15.5	0.0	0.0	2.5	0.0	3.0	21.3
	dec-30	26.0	6.7	16.3	65	8.6	15.3	0.7	3.1	31	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.4	0.0
	dec-31	25.4	6.0	15.7	65	8.5	14.6	0.8	3.0	30	7.2	52.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.7
Nov	dec-32	25.1	5.7	15.4	64	8.4	14.2	0.8	2.9	29	6.4	0.0	0.0	0.0	16.5	0.0	0.0	0.0	0.0	0.0	8.0	45.7
	dec-33	24.8	5.7	15.3	65	8.5	14.1	0.9	2.8	28	3.2	27.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	24.4	5.8	15.1	66	8.7	14.1	0.9	2.8	28	2.1	0.0	0.0	0.0	0.0	9.1	2.6	0.0	0.0	0.0	11.0	0.0
Dec	dec-35	24.2	5.8	15.0	66	8.8	14.2	1.0	2.8	28	2.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	25.5	0.0	0.0	0.0
	dec-36	24.1	6.1	15.1	66	8.7	14.0	1.0	2.8	28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		26.3	9.6	18.0	68	7.9	5275	0.8	3.3	1176	875	703	853	763	771	865	905	977	1224	872	705	985
										P/PET	0.7	0.6	0.7	0.6	0.7	0.7	0.8	0.8	1.0	0.7	0.6	0.8

station: Sumara rainfall
latitude: 14°07' average 1970-1972, 1976, 1982-1986
longitude: 44°12'
altitude: 1800 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)									
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1970	1971	1972	1976	1982	1983	1984	1985	1986
	dec-1	25.2	9.3	17.2	65	8.4	13.8	1.5	3.2	32	1.2	7.8	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	24.8	9.2	17.0	66	8.1	13.6	1.5	3.1	31	0.5	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0
	dec-3	25.3	10.1	17.7	65	8.2	14.0	1.6	3.3	33	1.7	0.0	0.0	0.0	0.0	0.0	7.5	0.0	7.4	0.0
	dec-4	25.9	11.2	18.6	63	8.3	14.6	1.6	3.5	35	0.5	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0
Feb	dec-5	26.3	11.7	19.0	63	8.3	15.0	1.6	3.7	37	3.8	7.6	0.0	8.5	0.0	0.0	12.7	0.0	0.0	5.8
	dec-6	26.9	12.1	19.5	62	8.3	15.4	1.6	3.9	39	4.7	3.5	0.0	12.7	15.0	0.0	7.5	0.0	0.0	3.6
	dec-7	27.9	12.6	20.2	61	8.3	15.7	1.7	4.1	41	27.4	86.1	5.9	0.0	33.2	107.1	0.0	0.0	0.0	14.1
Mar	dec-8	28.3	12.8	20.6	60	8.3	16.0	1.7	4.3	43	14.8	17.8	5.5	0.0	22.1	2.4	38.8	6.8	11.2	29.0
	dec-9	28.5	13.4	20.9	60	8.4	16.3	1.7	4.4	44	26.1	0.0	15.2	39.2	39.6	102.1	0.0	0.0	32.2	6.9
	dec-10	28.6	14.2	21.4	60	8.5	16.7	1.7	4.5	45	35.7	36.6	10.3	126.7	29.7	6.3	9.8	0.0	61.8	40.5
Apr	dec-11	28.7	14.6	21.7	59	8.6	16.8	1.7	4.6	46	44.4	76.4	41.0	95.2	28.8	23.0	59.9	34.3	33.0	8.1
	dec-12	29.7	15.2	22.4	58	8.6	16.8	1.6	4.7	47	44.8	41.7	0.0	91.7	90.0	30.7	32.8	7.7	65.2	43.5
	dec-13	30.9	15.9	23.4	57	8.6	16.6	1.6	4.8	48	46.3	21.7	60.2	135.9	21.0	24.5	2.3	43.7	71.9	35.3
May	dec-14	31.6	16.3	23.9	57	8.5	16.5	1.6	4.8	48	33.7	30.0	100.2	61.1	18.7	0.0	45.5	26.4	13.6	8.1
	dec-15	32.0	16.2	24.1	57	8.4	16.2	1.6	4.8	48	33.0	0.0	54.6	36.5	2.0	0.0	89.5	76.7	20.0	17.3
	dec-16	32.6	16.0	24.3	56	8.3	15.9	1.6	4.7	47	21.4	27.8	1.8	19.0	21.9	4.3	0.0	41.5	14.8	61.6
Jun	dec-17	33.0	16.0	24.5	56	8.2	15.8	1.6	4.7	47	23.4	11.5	36.6	18.6	38.0	36.4	4.9	11.9	37.8	15.1
	dec-18	32.3	16.3	24.3	59	7.8	15.0	1.6	4.5	45	29.0	40.3	46.2	33.9	14.1	0.0	45.5	7.2	71.4	2.3
	dec-19	31.4	16.9	24.1	62	7.2	14.1	1.6	4.2	42	47.7	13.7	0.0	149.3	30.6	23.7	31.1	49.8	85.7	45.2
Jul	dec-20	30.9	17.1	24.0	63	6.9	13.7	1.6	4.1	41	36.1	60.7	105.0	45.3	20.2	26.8	22.8	12.6	23.9	7.4
	dec-21	30.9	17.2	24.0	64	7.0	13.9	1.5	4.1	41	46.5	48.0	114.2	50.8	46.0	41.4	21.9	38.6	16.3	41.7
	dec-22	30.8	17.3	24.1	65	7.1	14.2	1.4	4.1	41	63.4	63.8	269.9	36.9	31.1	58.5	15.7	19.5	23.8	51.1
Aug	dec-23	30.8	17.3	24.1	66	7.1	14.3	1.4	4.1	41	51.0	66.3	83.8	100.6	47.8	63.0	2.9	15.8	73.9	4.5
	dec-24	30.7	16.7	23.7	64	7.4	14.7	1.3	4.1	41	46.0	17.3	23.8	185.5	13.6	25.0	37.6	42.1	35.3	33.4
	dec-25	30.6	15.9	23.2	62	7.7	15.1	1.3	4.2	42	55.6	82.2	94.6	47.3	63.5	8.1	2.4	63.4	69.0	70.1
Sep	dec-26	30.5	15.5	23.0	61	7.8	15.2	1.3	4.2	42	16.1	0.0	35.3	12.9	3.0	6.2	19.5	17.1	17.5	33.3
	dec-27	30.0	14.1	22.1	60	8.2	15.7	1.4	4.2	42	23.0	53.7	76.0	32.2	0.0	24.5	9.4	5.6	5.8	0.0
	dec-28	29.4	12.2	20.8	58	8.8	16.3	1.5	4.3	43	6.5	9.6	0.0	37.4	5.0	6.3	0.0	0.0	0.0	0.0
Oct	dec-29	29.1	11.2	20.2	57	9.1	16.4	1.6	4.2	42	3.1	6.4	0.0	19.7	0.0	1.9	0.0	0.0	0.0	0.0
	dec-30	28.3	10.5	19.4	57	9.1	16.0	1.6	4.0	40	5.0	0.0	0.0	0.0	38.9	6.5	0.0	0.0	0.0	0.0
	dec-31	27.2	9.6	18.4	57	9.1	15.6	1.6	3.8	38	8.5	0.0	17.3	39.4	0.0	13.7	0.0	0.0	6.2	0.0
Nov	dec-32	26.7	9.2	17.9	57	9.1	15.2	1.5	3.6	36	11.1	0.0	0.0	67.6	0.0	0.0	0.0	8.5	23.7	0.0
	dec-33	26.4	9.3	17.9	59	9.1	14.8	1.5	3.5	35	11.6	0.0	21.9	15.3	0.0	67.5	0.0	0.0	0.0	0.0
	dec-34	26.1	9.4	17.8	61	9.0	14.5	1.5	3.4	34	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Dec	dec-35	26.0	9.5	17.7	62	9.0	14.3	1.5	3.3	33	0.1	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0
	dec-36	25.6	9.4	17.5	63	8.7	14.0	1.5	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		28.9	13.4	21.1	61	8.3	5488	1.5	4.1	1461	824	831	1219	1519	677	716	525	529	821	579
										P/PET	0.6	0.6	0.8	1.0	0.5	0.5	0.4	0.4	0.6	0.4

station: Yarim/Kitab (agro-)meteorological
latitude: 14°12' average 1970-1980, 1983-1986
longitude: 44°20'
altitude: 2500 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1973	1974	1975	1976	1977	1978	1979	1980	1983	1984	1985	1986
	dec-1	20.7	-1.4	9.6	48	9.1	14.7	1.5	2.9	29	5.2	0.0	0.0	0.0	0.0	0.0	43.8	34.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	20.6	-1.1	9.8	51	9.1	14.9	1.5	2.9	29	6.0	0.0	0.0	2.3	0.0	12.1	0.0	71.2	0.0	0.0	0.0	0.0	0.0
	dec-3	20.4	-0.0	10.2	48	9.0	15.1	1.6	3.1	31	4.3	0.0	0.0	6.8	0.0	0.0	0.0	20.1	0.0	26.6	0.0	9.5	0.0
	dec-4	20.1	1.3	10.7	44	8.9	15.3	1.7	3.3	33	10.3	0.0	5.8	0.0	20.1	7.5	17.2	7.0	0.0	76.9	0.0	0.0	19.5
Feb	dec-5	19.9	2.0	11.0	43	8.8	15.7	1.7	3.4	34	10.2	0.0	0.0	37.7	0.0	0.0	24.5	30.6	0.0	17.8	0.0	0.0	36.2
	dec-6	20.6	1.9	11.2	44	8.8	16.1	1.7	3.5	35	10.0	0.0	16.1	0.0	9.7	0.0	33.1	36.3	24.6	0.0	0.0	0.0	11.8
	dec-7	21.5	1.7	11.6	45	8.7	16.3	1.7	3.7	37	13.4	0.0	20.2	7.7	13.4	5.2	37.4	17.9	46.2	0.0	0.0	5.9	27.2
Mar	dec-8	22.0	1.6	11.8	46	8.7	16.6	1.7	3.7	37	20.7	0.0	0.0	8.8	22.4	9.6	15.4	51.7	54.6	19.2	32.0	2.4	42.7
	dec-9	22.3	2.2	12.3	47	8.7	16.7	1.7	3.8	38	31.1	2.4	39.1	26.7	47.0	11.2	8.9	84.0	65.4	46.0	0.0	33.9	0.0
	dec-10	22.8	3.0	12.9	47	8.6	16.8	1.7	3.9	39	28.8	0.0	45.2	61.8	23.5	20.9	17.9	30.1	1.9	14.9	35.4	55.4	25.0
Apr	dec-11	23.1	3.5	13.3	48	8.5	16.8	1.7	3.9	39	22.0	21.0	10.3	11.1	4.4	0.0	53.5	36.7	34.9	39.9	21.0	1.5	34.7
	dec-12	23.9	4.2	14.0	46	8.6	16.9	1.7	4.1	41	32.2	0.0	9.5	0.0	79.1	12.7	22.7	56.8	43.4	0.0	0.0	76.9	49.9
	dec-13	24.9	5.1	15.0	43	8.8	17.0	1.7	4.3	43	47.3	29.8	27.7	11.4	66.3	23.3	47.2	147.3	112.2	0.0	75.1	51.9	100.3
May	dec-14	25.5	5.6	15.5	42	8.8	17.0	1.8	4.3	43	17.3	19.1	16.3	0.0	1.1	39.9	42.2	0.0	19.9	22.0	67.7	7.3	0.0
	dec-15	25.6	5.5	15.6	41	8.8	16.8	1.8	4.3	43	26.6	0.0	56.6	0.0	0.0	68.5	32.7	0.0	25.8	102.5	34.3	7.9	0.0
	dec-16	25.9	5.5	15.7	39	8.7	16.6	1.8	4.3	43	12.4	0.0	8.5	26.1	0.0	0.0	30.4	64.3	29.3	0.0	7.4	0.0	0.0
Jun	dec-17	26.0	5.5	15.8	38	8.7	16.5	1.8	4.3	43	15.8	36.8	5.3	38.1	0.0	0.0	22.8	49.6	18.2	26.6	22.2	0.0	0.0
	dec-18	25.4	6.1	15.7	40	8.2	15.7	1.8	4.2	42	13.5	9.3	19.4	38.0	27.1	0.0	25.3	19.8	0.0	0.0	8.8	5.9	0.0
	dec-19	24.5	6.8	15.7	42	7.6	14.7	1.8	4.0	40	24.0	16.6	29.5	4.3	0.0	0.0	56.7	110.1	17.9	0.0	26.8	0.0	43.7
Jul	dec-20	24.1	7.2	15.6	43	7.2	14.3	1.9	3.9	39	38.0	0.0	51.1	0.0	12.6	29.8	26.5	77.8	173.0	38.9	37.7	31.3	5.2
	dec-21	24.5	7.3	15.9	45	7.2	14.3	1.8	3.9	39	42.2	61.6	33.9	0.0	51.3	41.4	77.3	142.2	62.6	9.5	0.0	15.1	63.3
	dec-22	25.0	7.5	16.3	48	7.1	14.2	1.7	3.9	39	64.9	37.2	99.6	119.4	29.2	88.0	52.0	91.0	186.1	28.8	47.7	56.2	48.1
Aug	dec-23	25.3	7.6	16.5	49	7.1	14.2	1.7	3.8	38	72.4	51.1	33.1	99.2	55.8	85.7	38.7	152.8	256.9	14.0	44.0	97.8	28.7
	dec-24	25.2	6.6	15.9	48	7.5	14.9	1.7	3.9	39	54.2	49.9	18.9	55.7	3.4	30.9	46.5	175.6	119.4	78.5	61.8	38.7	42.0
	dec-25	25.1	5.2	15.2	46	8.0	15.6	1.6	3.9	39	26.2	43.3	15.7	48.4	3.2	13.1	39.5	61.4	65.0	3.1	37.8	7.5	0.0
Sep	dec-26	25.1	4.5	14.8	46	8.2	15.9	1.6	3.9	39	22.9	0.0	5.3	9.8	4.0	0.0	53.4	37.3	119.7	5.3	3.8	24.3	28.7
	dec-27	24.3	3.7	14.0	44	8.7	16.4	1.6	3.9	39	5.0	11.2	0.0	0.0	0.0	15.7	7.9	20.9	19.9	0.0	0.0	0.0	0.0
	dec-28	23.2	2.7	13.0	42	9.4	17.1	1.6	3.9	39	4.4	0.0	2.3	0.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	3.9	0.0
Oct	dec-29	22.7	2.2	12.5	41	9.7	17.2	1.6	3.8	38	2.8	0.0	0.0	0.0	0.0	24.1	18.3	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	22.1	0.0	11.1	41	9.7	16.8	1.6	3.5	35	11.3	0.0	0.0	0.0	8.6	92.9	0.0	0.0	45.0	0.0	0.0	0.0	0.0
	dec-31	21.4	-2.9	9.2	41	9.7	16.3	1.5	3.2	32	3.0	0.0	0.0	0.0	44.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	21.0	-4.4	8.3	41	9.7	15.9	1.5	3.1	31	2.5	0.0	0.0	0.0	3.7	0.0	8.5	0.0	0.0	0.0	5.9	0.0	0.0
	dec-33	21.0	-3.7	8.7	42	9.5	15.4	1.5	3.0	30	2.5	0.0	0.0	0.0	0.0	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	20.9	-2.7	9.1	43	9.3	14.9	1.5	2.9	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	20.9	-2.2	9.4	43	9.2	14.7	1.5	2.9	29	2.4	0.0	4.5	0.0	0.0	16.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	20.8	-1.8	9.5	46	9.2	14.6	1.5	2.9	29	2.5	7.9	0.0	0.0	0.0	29.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		23.0	2.7	12.8	44	8.7	5688	1.7	3.7	1324	708	397	574	613	531	716	960	1627	1542	571	569	533	607
										P/PET	0.5	0.3	0.4	0.5	0.4	0.5	0.7	1.2	1.2	0.4	0.4	0.4	0.5

station: Hajja (agro-)meteorological
latitude: 15°43' average 1975-1976, 1979, 1986-1989
longitude: 43°37'
altitude: 1100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)							
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1976	1979	1986	1987	1988	1989
	dec-1	29.7	11.4	20.6	62	7.0	12.9	0.9	3.0	30	2.7	0.0	0.0	0.0	10.0	0.0	8.7	0.0
Jan	dec-2	29.2	11.2	20.2	62	7.7	13.8	1.0	3.1	31	3.6	0.0	0.0	0.0	0.0	15.0	4.1	6.3
	dec-3	29.8	11.8	20.8	62	7.0	13.4	1.0	3.2	32	0.3	0.4	0.0	0.0	1.0	1.0	0.0	0.0
	dec-4	30.6	12.7	21.6	61	6.0	13.0	1.0	3.3	33	0.9	0.0	0.0	0.0	0.0	0.0	0.3	6.1
Feb	dec-5	31.0	13.1	22.1	61	5.3	12.8	1.0	3.3	33	6.0	20.0	0.0	0.0	19.0	0.0	2.0	1.3
	dec-6	31.7	13.8	22.8	60	5.9	13.8	1.0	3.6	36	3.0	0.0	0.0	0.0	4.0	4.0	12.7	0.0
	dec-7	32.7	14.6	23.7	59	6.8	15.1	1.0	3.9	39	15.5	0.0	0.0	0.0	102.0	6.0	0.3	0.0
Mar	dec-8	33.2	15.1	24.2	59	7.0	15.7	1.0	4.1	41	8.3	0.0	0.0	12.3	20.0	10.0	8.2	7.9
	dec-9	33.2	15.1	24.2	59	6.8	15.8	0.9	4.1	41	37.3	0.0	111.1	0.0	7.0	63.0	0.0	79.8
	dec-10	33.1	15.2	24.2	60	6.6	15.8	0.9	4.1	41	38.3	10.0	56.5	75.3	66.0	0.0	5.8	54.7
Apr	dec-11	33.1	15.2	24.2	60	6.5	15.8	0.8	4.1	41	44.3	71.4	70.2	0.0	77.0	0.0	81.8	9.5
	dec-12	33.4	15.6	24.5	59	7.1	16.6	0.9	4.4	44	45.2	62.7	114.2	0.0	91.0	1.0	24.1	23.2
	dec-13	33.8	16.1	25.0	58	8.1	17.7	0.9	4.7	47	28.5	0.2	81.9	34.3	56.0	27.0	0.0	0.3
May	dec-14	34.0	16.3	25.2	57	8.7	18.2	1.0	4.8	48	47.0	0.0	76.6	50.6	30.0	139.0	2.1	30.7
	dec-15	34.5	16.5	25.5	55	8.2	17.6	0.9	4.7	47	7.0	0.0	5.0	23.4	8.0	4.0	0.0	8.7
	dec-16	35.2	16.8	26.0	53	7.5	16.8	0.9	4.6	46	8.9	10.5	0.0	0.0	27.0	5.0	4.3	15.3
Jun	dec-17	35.5	16.9	26.2	52	7.1	16.4	0.9	4.5	45	10.7	20.0	5.0	12.0	22.0	0.0	3.7	12.5
	dec-18	35.0	17.4	26.2	55	6.6	15.9	0.9	4.4	44	7.7	11.0	0.0	0.0	1.0	0.0	40.2	1.8
	dec-19	34.4	18.1	26.3	59	7.5	16.7	0.9	4.6	46	24.6	0.0	0.0	0.0	88.0	33.8	7.1	43.0
Jul	dec-20	34.1	18.4	26.3	61	5.6	14.9	0.9	4.1	41	16.0	20.4	7.2	0.0	24.0	6.4	15.8	38.4
	dec-21	34.5	18.3	26.4	62	6.1	15.4	0.9	4.2	42	49.0	62.0	118.3	54.2	47.0	22.1	10.2	29.0
	dec-22	34.9	18.0	26.5	62	6.8	16.1	0.9	4.4	44	58.5	114.7	50.2	65.5	68.0	38.9	21.3	50.7
Aug	dec-23	35.1	17.9	26.5	62	7.1	16.4	0.9	4.5	45	34.1	8.5	37.8	51.4	31.0	29.1	49.0	32.1
	dec-24	35.2	17.1	26.2	60	7.5	16.7	0.9	4.5	45	30.3	36.0	61.3	23.3	12.0	21.9	41.2	16.6
	dec-25	35.4	16.2	25.8	58	8.1	17.2	0.9	4.5	45	25.4	46.6	39.7	0.0	25.0	5.0	57.2	4.1
Sep	dec-26	35.4	15.7	25.6	57	8.5	17.4	0.8	4.5	45	17.4	25.5	36.0	0.0	18.0	0.6	30.3	11.6
	dec-27	35.3	14.9	25.1	55	8.5	17.0	0.9	4.4	44	7.2	38.4	0.0	0.0	6.0	0.0	0.3	5.6
	dec-28	35.2	14.0	24.6	52	8.4	16.5	0.9	4.2	42	0.6	0.0	0.0	0.0	0.0	0.0	4.1	0.0
Oct	dec-29	35.2	13.5	24.3	51	8.6	16.3	0.9	4.1	41	2.4	0.0	0.0	12.0	2.0	0.0	1.0	1.8
	dec-30	34.5	13.0	23.7	52	8.2	15.3	0.9	3.8	38	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.3
	dec-31	33.6	12.3	22.9	54	7.4	14.1	0.9	3.5	35	4.9	0.0	0.0	25.8	0.0	0.0	8.0	0.3
Nov	dec-32	33.1	11.9	22.5	54	7.1	13.5	0.8	3.3	33	1.3	0.0	1.3	0.0	8.0	0.0	0.0	0.0
	dec-33	32.3	11.9	22.1	57	6.6	12.7	0.8	3.1	31	0.2	0.0	0.0	0.0	0.0	1.3	0.0	0.3
	dec-34	31.2	11.9	21.5	62	5.6	11.6	0.8	2.8	28	8.4	22.5	0.0	0.0	18.0	1.4	0.0	16.8
Dec	dec-35	30.6	11.9	21.3	64	5.1	11.1	0.8	2.7	27	0.6	0.0	0.0	0.0	1.0	1.1	1.8	0.0
	dec-36	30.2	11.6	20.9	63	6.1	12.0	0.9	2.8	28	1.7	0.0	0.0	0.0	0.0	12.2	0.0	0.0
Year		33.3	14.8	24.0	58	7.1	5478	0.9	3.9	1420	598	581	873	440	889	449	446	509
										P/PET	0.4	0.4	0.6	0.3	0.6	0.3	0.3	0.4

station: Hammam Ali rainfall
latitude: 14°39 average 1975, 1978-1981, 1983, 1986
longitude: 44°09'
altitude: 2000 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)							
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1978	1979	1980	1981	1983	1986
	dec-1	24.2	8.4	16.3	65	8.4	14.3	1.5	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	23.8	8.4	16.1	66	8.1	14.3	1.5	3.2	32	1.9	0.0	13.5	0.0	0.0	0.0	0.0	0.0
	dec-3	24.2	9.3	16.8	65	8.2	14.8	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	24.9	10.5	17.7	63	8.3	15.3	1.6	3.7	37	1.3	0.0	0.0	7.5	0.0	0.0	0.0	1.4
Feb	dec-5	25.2	11.1	18.2	63	8.3	15.9	1.6	3.9	39	11.4	0.0	0.0	11.5	0.0	14.5	52.0	2.1
	dec-6	25.9	11.4	18.7	62	8.3	16.3	1.6	4.1	41	3.8	0.0	0.0	20.0	0.0	6.5	0.0	0.0
	dec-7	26.8	11.8	19.3	61	8.3	16.7	1.7	4.3	43	7.8	16.8	0.0	28.5	0.0	0.0	0.0	9.0
Mar	dec-8	27.2	12.0	19.6	60	8.3	17.1	1.7	4.5	45	13.9	38.3	18.5	33.5	0.0	6.7	0.0	0.0
	dec-9	27.4	12.7	20.0	60	8.4	17.5	1.7	4.6	46	24.8	19.9	104.0	0.0	38.0	11.5	0.0	0.0
	dec-10	27.6	13.6	20.6	60	8.5	17.9	1.7	4.7	47	46.1	65.4	22.5	0.0	112.2	44.5	72.0	6.0
Apr	dec-11	27.7	14.0	20.9	59	8.6	18.1	1.7	4.8	48	26.1	28.9	0.0	0.0	36.5	103.5	8.5	5.0
	dec-12	28.8	14.6	21.7	58	8.6	18.1	1.6	4.9	49	41.7	16.8	0.0	75.0	13.5	164.3	14.5	8.0
	dec-13	30.3	15.3	22.8	57	8.6	18.0	1.6	5.1	51	32.4	0.0	0.0	13.5	95.0	91.0	22.0	5.0
May	dec-14	31.1	15.7	23.4	57	8.5	18.0	1.6	5.1	51	27.4	3.8	0.0	0.0	12.5	97.0	63.5	15.3
	dec-15	31.6	15.6	23.6	57	8.4	17.8	1.6	5.1	51	22.1	0.0	0.0	32.0	7.5	15.5	100.0	0.0
	dec-16	32.3	15.4	23.9	56	8.3	17.6	1.6	5.1	51	6.2	3.5	0.0	0.0	40.0	0.0	0.0	0.0
Jun	dec-17	32.6	15.4	24.0	56	8.2	17.4	1.6	5.1	51	8.5	8.0	0.0	22.5	13.5	0.0	0.0	15.6
	dec-18	31.8	15.7	23.8	59	7.8	17.0	1.6	5.0	50	18.5	73.6	0.0	29.0	27.0	0.0	0.0	0.0
	dec-19	30.7	16.3	23.5	62	7.2	16.4	1.6	4.8	48	21.6	79.0	0.0	17.5	55.0	0.0	0.0	0.0
Jul	dec-20	30.2	16.5	23.4	63	6.9	16.1	1.6	4.7	47	10.0	35.6	15.5	0.0	0.0	14.0	0.0	4.7
	dec-21	30.1	16.6	23.3	64	7.0	16.2	1.5	4.7	47	30.1	106.0	0.0	32.5	13.5	0.0	31.1	27.5
	dec-22	29.9	16.7	23.3	65	7.1	16.4	1.4	4.6	46	49.0	184.8	0.0	8.5	93.0	32.8	0.0	24.2
Aug	dec-23	29.8	16.7	23.3	66	7.1	16.4	1.4	4.6	46	41.3	164.5	0.0	24.0	17.0	33.5	46.5	3.9
	dec-24	29.7	16.1	22.9	64	7.4	16.6	1.3	4.6	46	41.9	151.3	0.0	81.0	13.5	10.0	21.2	16.4
	dec-25	29.6	15.3	22.4	62	7.7	16.8	1.3	4.6	46	18.8	53.5	0.0	0.0	0.0	74.5	0.0	3.4
Sep	dec-26	29.5	14.9	22.2	61	7.8	16.7	1.3	4.5	45	27.8	0.0	18.5	0.0	0.0	158.5	10.5	7.2
	dec-27	29.0	13.3	21.1	60	8.2	16.9	1.4	4.4	44	6.3	0.0	7.5	23.4	0.0	7.0	0.0	6.4
	dec-28	28.2	11.1	19.7	58	8.8	17.1	1.5	4.3	43	6.2	0.0	15.5	0.0	21.2	6.5	0.0	0.0
Oct	dec-29	27.8	10.0	18.9	57	9.1	16.9	1.6	4.2	42	1.8	0.0	12.5	0.0	0.0	0.0	0.0	0.0
	dec-30	26.9	9.3	18.1	57	9.1	16.4	1.6	4.0	40	8.6	0.0	60.5	0.0	0.0	0.0	0.0	0.0
	dec-31	25.8	8.4	17.1	57	9.1	15.9	1.6	3.7	37	21.5	0.0	150.5	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	25.2	8.0	16.6	57	9.1	15.5	1.5	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	25.1	8.1	16.6	59	9.1	15.1	1.5	3.4	34	0.8	0.0	5.5	0.0	0.0	0.0	0.0	0.0
	dec-34	25.0	8.2	16.6	61	9.0	14.8	1.5	3.3	33	1.2	0.0	8.5	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	25.0	8.3	16.6	62	9.0	14.6	1.5	3.3	33	1.9	0.0	13.5	0.0	0.0	0.0	0.0	0.0
	dec-36	24.6	8.4	16.5	63	8.7	14.4	1.5	3.2	32	2.3	0.0	15.8	0.0	0.0	0.0	0.0	0.0
Year		27.9	12.6	20.3	61	8.3	5913	1.5	4.3	1546	585	1050	482	460	609	892	442	161
										P/PET	0.4	0.7	0.3	0.3	0.4	0.6	0.3	0.1

station: Mahweet (agro-)meteorological
latitude: 15°28' average 1988-1989
longitude: 43°38'
altitude: 2000 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)		
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1988	1989
	dec-1	25.4	10.8	18.1	67	8.8	14.5	2.0	3.5	35	0.3	0.6	0.0
Jan	dec-2	24.7	11.3	18.0	72	8.6	14.6	2.0	3.4	34	0.0	0.0	0.0
	dec-3	25.4	11.9	18.7	68	8.9	15.3	2.1	3.7	37	0.2	0.0	0.3
	dec-4	26.3	12.7	19.5	63	9.3	16.2	2.1	4.1	41	5.0	0.0	10.0
Feb	dec-5	26.8	13.1	20.0	61	9.2	16.6	2.2	4.4	44	0.9	1.5	0.3
	dec-6	27.7	13.8	20.7	60	9.1	17.0	2.2	4.6	46	0.9	1.8	0.0
	dec-7	28.8	14.6	21.7	59	9.2	17.6	2.3	5.0	50	0.0	0.0	0.0
Mar	dec-8	29.4	15.1	22.2	59	9.1	17.8	2.4	5.2	52	0.4	0.0	0.8
	dec-9	29.5	15.4	22.4	60	8.9	18.0	2.3	5.2	52	6.7	0.0	13.3
	dec-10	29.6	15.8	22.7	61	8.9	18.3	2.3	5.3	53	49.9	8.6	91.1
Apr	dec-11	29.7	16.1	22.9	62	8.9	18.4	2.3	5.3	53	29.3	49.2	9.4
	dec-12	31.2	16.5	23.8	58	9.5	19.0	2.4	5.7	57	59.7	83.6	35.8
	dec-13	33.2	17.0	25.1	53	10.3	19.9	2.6	6.3	63	0.0	0.0	0.0
May	dec-14	34.2	17.3	25.7	51	10.8	20.3	2.8	6.6	66	22.1	3.1	41.1
	dec-15	34.9	17.9	26.4	51	10.8	20.2	2.8	6.7	67	1.2	0.0	2.3
	dec-16	35.9	18.7	27.3	51	10.7	20.0	2.9	6.9	69	9.2	2.8	15.5
Jun	dec-17	36.4	19.1	27.7	52	10.6	19.9	2.9	7.0	70	34.2	29.7	38.6
	dec-18	35.3	19.3	27.3	57	9.5	18.8	3.0	6.5	65	24.3	42.0	6.6
	dec-19	33.8	19.7	26.8	64	9.5	18.8	3.0	6.2	62	18.5	1.3	35.6
Jul	dec-20	33.1	19.9	26.5	68	7.3	16.5	3.1	5.6	56	50.8	41.4	60.2
	dec-21	33.1	19.3	26.2	70	7.3	16.6	2.8	5.4	54	49.7	45.3	54.1
	dec-22	33.0	18.6	25.8	72	7.3	16.7	2.5	5.2	52	50.3	73.6	27.0
Aug	dec-23	33.0	18.3	25.6	73	7.4	16.7	2.4	5.1	51	56.7	45.6	67.7
	dec-24	32.9	17.7	25.3	69	8.2	17.5	2.3	5.3	53	42.3	70.9	13.6
	dec-25	32.8	17.0	24.9	65	9.4	18.5	2.3	5.5	55	23.1	42.8	3.3
Sep	dec-26	32.7	16.7	24.7	63	10.1	19.0	2.3	5.6	56	5.0	9.5	0.5
	dec-27	31.9	15.5	23.7	61	10.2	18.7	2.4	5.4	54	4.2	7.3	1.0
	dec-28	30.9	13.8	22.4	58	10.1	18.3	2.4	5.2	52	0.3	0.3	0.3
Oct	dec-29	30.4	13.0	21.7	57	10.4	18.0	2.5	5.1	51	2.2	0.0	4.4
	dec-30	29.2	12.2	20.7	58	10.4	17.5	2.4	4.7	47	0.3	0.0	0.6
	dec-31	27.6	11.1	19.4	60	10.2	16.7	2.2	4.3	43	0.2	0.3	0.0
Nov	dec-32	26.8	10.6	18.7	61	10.3	16.4	2.2	4.0	40	0.0	0.0	0.0
	dec-33	26.8	10.4	18.6	59	10.0	15.7	2.1	3.9	39	0.2	0.3	0.0
	dec-34	26.8	10.1	18.4	57	9.2	14.7	2.0	3.8	38	0.2	0.3	0.0
Dec	dec-35	26.8	9.9	18.4	56	8.8	14.3	2.0	3.7	37	0.7	1.3	0.0
	dec-36	26.1	10.4	18.2	61	8.9	14.4	2.0	3.6	36	0.2	0.3	0.0
Year		30.3	15.0	22.7	61	9.3	6274	2.4	5.1	1830	548	563	533
										P/PET	0.3	0.3	0.3

station: Shibam
latitude: 15°31'
longitude: 43°54'
altitude: 2550 m

rainfall
average 1975-1977

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)			
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1976	1977
	dec-1	24.2	-1.9	11.2	42	10.3	15.7	1.7	3.2	32	0.0	0.0	0.0	0.0
Jan	dec-2	23.5	-1.9	10.8	43	10.7	16.4	1.7	3.3	33	8.3	0.0	0.0	25.0
	dec-3	24.0	-0.7	11.6	43	10.2	16.4	1.8	3.5	35	8.3	0.0	0.0	25.0
	dec-4	24.6	0.9	12.8	43	9.7	16.5	1.9	3.8	38	0.0	0.0	0.0	0.0
Feb	dec-5	24.9	1.7	13.3	43	9.4	16.8	2.0	4.0	40	1.3	4.0	0.0	0.0
	dec-6	25.3	3.2	14.2	44	9.2	17.1	2.0	4.2	42	0.0	0.0	0.0	0.0
	dec-7	25.8	5.1	15.4	45	9.0	17.3	2.1	4.5	45	5.9	8.6	9.0	0.0
Mar	dec-8	26.1	6.0	16.1	46	8.8	17.6	2.2	4.6	46	9.3	5.0	4.0	19.0
	dec-9	25.7	6.4	16.1	48	8.7	17.8	2.1	4.7	47	27.5	32.6	35.0	15.0
	dec-10	25.3	6.8	16.0	50	8.6	17.9	2.1	4.6	46	28.7	56.0	14.0	16.0
Apr	dec-11	25.0	7.0	16.0	51	8.5	18.0	2.0	4.6	46	15.6	3.9	21.0	22.0
	dec-12	25.7	7.2	16.5	45	9.1	18.7	2.1	4.9	49	34.0	31.0	30.0	41.0
	dec-13	26.5	7.5	17.0	36	10.0	19.6	2.3	5.4	54	27.7	0.0	66.0	17.0
May	dec-14	27.0	7.7	17.3	32	10.4	19.9	2.4	5.6	56	17.7	0.0	26.0	27.0
	dec-15	27.6	8.2	17.9	31	10.4	19.8	2.5	5.7	57	24.0	0.0	0.0	72.0
	dec-16	28.4	8.8	18.6	29	10.3	19.6	2.6	5.9	59	13.3	40.0	0.0	0.0
Jun	dec-17	28.8	9.1	19.0	28	10.3	19.5	2.6	6.0	60	8.0	0.0	24.0	0.0
	dec-18	28.9	9.7	19.3	32	9.5	18.7	2.5	5.8	58	14.3	25.0	3.0	15.0
	dec-19	29.0	10.5	19.7	37	8.4	17.7	2.4	5.5	55	10.3	0.0	5.0	26.0
Jul	dec-20	29.0	10.9	20.0	39	7.9	17.2	2.3	5.4	54	33.0	35.0	64.0	0.0
	dec-21	28.7	10.8	19.7	42	8.0	17.3	2.3	5.3	53	61.3	144.0	40.0	0.0
	dec-22	28.4	10.6	19.5	45	8.1	17.4	2.3	5.2	52	69.7	95.0	50.0	64.0
Aug	dec-23	28.2	10.4	19.3	47	8.1	17.5	2.3	5.2	52	71.0	71.5	24.5	117.0
	dec-24	28.4	10.0	19.2	43	8.6	17.9	2.1	5.2	52	27.7	71.0	0.0	12.0
	dec-25	28.7	9.4	19.1	38	9.2	18.4	1.8	5.1	51	15.0	37.0	0.0	8.0
Sep	dec-26	28.8	9.1	19.0	35	9.6	18.4	1.7	4.9	49	0.0	0.0	0.0	0.0
	dec-27	27.2	6.3	16.8	33	10.2	18.7	1.7	4.7	47	0.0	0.0	0.0	0.0
	dec-28	25.0	2.6	13.8	31	11.0	19.1	1.8	4.4	44	0.0	0.0	0.0	0.0
Oct	dec-29	23.9	0.7	12.3	31	11.4	19.0	1.8	4.2	42	14.3	0.0	0.0	43.0
	dec-30	23.6	-0.3	11.7	32	11.2	18.2	1.7	3.9	39	17.3	0.0	0.0	52.0
	dec-31	23.2	-1.6	10.8	33	10.9	17.4	1.6	3.5	35	19.0	0.0	57.0	0.0
Nov	dec-32	23.0	-2.3	10.3	34	10.8	16.8	1.6	3.3	33	0.0	0.0	0.0	0.0
	dec-33	23.8	-2.1	10.8	36	10.4	16.0	1.6	3.3	33	0.0	0.0	0.0	0.0
	dec-34	24.9	-1.9	11.5	39	9.8	15.2	1.6	3.2	32	0.0	0.0	0.0	0.0
Dec	dec-35	25.5	-1.8	11.8	41	9.5	14.9	1.7	3.2	32	0.0	0.0	0.0	0.0
	dec-36	24.8	-1.8	11.5	42	9.9	15.2	1.7	3.2	32	0.0	0.0	0.0	0.0
Year		26.2	4.7	15.4	39	9.6	6356	2.0	4.5	1630	583	660	473	616
										P/PET	0.4	0.4	0.3	0.4

station: Thula
latitude: 15°40'
longitude: 43°54'
altitude: 2200 m

rainfall
average 1976-1980

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1976	1977	1978	1979	1980
	dec-1	24.7	2.4	13.5	42	10.3	15.7	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	24.0	2.3	13.2	43	10.7	16.4	1.7	3.5	35	2.0	0.0	0.0	10.0	0.0	0.0
	dec-3	24.5	3.3	13.9	43	10.2	16.4	1.8	3.7	37	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	25.1	4.6	14.9	43	9.7	16.5	1.9	4.0	40	1.0	0.0	0.0	5.0	0.0	0.0
Feb	dec-5	25.5	5.3	15.4	43	9.4	16.8	2.0	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0
	dec-6	25.9	6.5	16.2	44	9.2	17.1	2.0	4.4	44	25.6	88.9	0.0	22.0	0.0	17.0
	dec-7	26.5	8.2	17.4	45	9.0	17.3	2.1	4.6	46	23.1	25.5	90.0	0.0	0.0	0.0
Mar	dec-8	26.9	9.0	17.9	46	8.8	17.6	2.2	4.8	48	20.2	1.3	0.0	16.0	21.0	62.5
	dec-9	26.7	9.4	18.0	48	8.7	17.8	2.1	4.9	49	27.6	43.1	0.0	8.0	32.0	54.8
	dec-10	26.5	9.8	18.2	50	8.6	17.9	2.1	4.8	48	13.1	15.0	15.0	17.0	0.0	18.5
Apr	dec-11	26.4	10.0	18.2	51	8.5	18.0	2.0	4.9	49	20.6	16.2	54.2	24.0	0.0	8.4
	dec-12	27.1	10.3	18.7	45	9.1	18.7	2.1	5.2	52	15.4	21.9	19.3	26.0	0.0	10.0
	dec-13	28.0	10.6	19.3	36	10.0	19.6	2.3	5.6	56	35.0	79.6	12.2	0.0	42.0	41.2
May	dec-14	28.4	10.8	19.6	32	10.4	19.9	2.4	5.9	59	13.7	38.3	0.0	30.0	0.0	0.0
	dec-15	29.0	11.3	20.2	31	10.4	19.8	2.5	6.0	60	2.4	0.2	0.0	12.0	0.0	0.0
	dec-16	29.8	12.0	20.9	29	10.3	19.6	2.6	6.2	62	1.6	2.0	0.0	6.0	0.0	0.0
Jun	dec-17	30.2	12.4	21.3	28	10.3	19.5	2.6	6.3	63	0.8	2.2	2.0	0.0	0.0	0.0
	dec-18	30.2	12.9	21.5	32	9.5	18.7	2.5	6.1	61	10.2	26.0	10.4	0.0	0.0	14.5
	dec-19	30.2	13.6	21.9	37	8.4	17.7	2.4	5.8	58	17.8	0.0	7.3	41.0	30.0	10.5
Jul	dec-20	30.2	13.9	22.1	39	7.9	17.2	2.3	5.6	56	17.9	0.0	20.0	8.0	32.0	29.5
	dec-21	30.0	13.8	21.9	42	8.0	17.3	2.3	5.6	56	37.6	6.2	11.2	46.0	25.0	99.6
	dec-22	29.8	13.7	21.7	45	8.1	17.4	2.3	5.5	55	72.9	18.5	53.3	61.0	19.0	212.6
Aug	dec-23	29.6	13.6	21.6	47	8.1	17.5	2.3	5.4	54	75.4	28.3	30.0	118.0	111.0	89.8
	dec-24	29.8	13.2	21.5	43	8.6	17.9	2.1	5.4	54	41.4	30.8	36.0	0.0	134.0	6.3
	dec-25	30.0	12.6	21.3	38	9.2	18.4	1.8	5.3	53	35.8	8.0	7.0	7.0	157.0	0.0
Sep	dec-26	30.2	12.4	21.3	35	9.6	18.4	1.7	5.2	52	0.4	2.0	0.0	0.0	0.0	0.0
	dec-27	28.6	10.0	19.3	33	10.2	18.7	1.7	5.0	50	0.3	1.3	0.0	0.0	0.0	0.0
	dec-28	26.6	6.8	16.7	31	11.0	19.1	1.8	4.7	47	1.4	4.0	3.0	0.0	0.0	0.0
Oct	dec-29	25.6	5.2	15.4	31	11.4	18.9	1.8	4.5	45	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	25.1	4.1	14.6	32	11.2	18.2	1.7	4.2	42	15.2	0.0	76.2	0.0	0.0	0.0
	dec-31	24.5	2.8	13.6	33	10.9	17.4	1.6	3.8	38	10.6	53.0	0.0	0.0	0.0	0.0
Nov	dec-32	24.2	2.1	13.2	34	10.8	16.8	1.6	3.6	36	5.9	0.0	5.3	24.0	0.0	0.0
	dec-33	24.8	2.2	13.5	36	10.4	16.0	1.6	3.5	35	0.2	0.0	1.0	0.0	0.0	0.0
	dec-34	25.6	2.4	14.0	39	9.8	15.2	1.6	3.4	34	1.4	0.0	7.1	0.0	0.0	0.0
Dec	dec-35	26.0	2.4	14.2	41	9.5	14.9	1.7	3.4	34	3.2	0.0	1.2	15.0	0.0	0.0
	dec-36	25.4	2.4	13.9	42	9.9	15.2	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
Year		27.3	8.3	17.8	39	9.6	6355	2.0	4.8	1719	550	512	462	496	603	675
										P/PET	0.3	0.3	0.3	0.3	0.4	0.4

station: Rhihab
latitude: 14°14'
longitude: 44°11'
altitude: 1500 m

rainfall
average 1983-1986

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)				
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1983	1984	1985	1986
	dec-1	26.7	10.7	18.7	65	8.4	13.7	1.5	3.3	33	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	26.3	10.4	18.4	66	8.1	13.6	1.5	3.2	32	0.0	0.0	0.0	0.0	0.0
	dec-3	26.8	11.2	19.0	65	8.2	14.0	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0
	dec-4	27.5	12.2	19.8	63	8.3	14.5	1.6	3.7	37	7.5	30.0	0.0	0.0	0.0
Feb	dec-5	27.9	12.6	20.2	63	8.3	15.0	1.6	3.8	38	6.4	25.5	0.0	0.0	0.0
	dec-6	28.5	13.1	20.8	62	8.3	15.4	1.6	4.0	40	7.8	0.0	0.0	0.0	31.0
	dec-7	29.5	13.7	21.6	61	8.3	15.7	1.7	4.3	43	3.3	0.0	3.0	0.0	10.0
Mar	dec-8	29.9	14.0	22.0	60	8.3	16.0	1.7	4.4	44	11.3	5.0	0.0	2.0	38.0
	dec-9	30.1	14.5	22.3	60	8.4	16.3	1.7	4.5	45	19.3	0.0	0.0	59.0	18.0
	dec-10	30.2	15.2	22.7	60	8.5	16.7	1.7	4.7	47	29.5	15.0	0.0	61.0	42.0
Apr	dec-11	30.3	15.5	22.9	59	8.6	16.8	1.7	4.7	47	21.5	70.0	0.0	8.9	7.0
	dec-12	31.0	16.1	23.5	58	8.6	16.8	1.6	4.8	48	35.5	30.0	0.0	77.0	35.0
	dec-13	31.8	16.8	24.3	57	8.6	16.6	1.6	4.9	49	73.3	48.0	115.0	59.0	71.0
May	dec-14	32.3	17.2	24.7	57	8.5	16.5	1.6	4.9	49	42.5	89.0	60.0	8.0	13.0
	dec-15	32.7	17.1	24.9	57	8.4	16.2	1.6	4.8	48	62.4	133.0	68.5	48.0	0.0
	dec-16	33.2	16.9	25.1	56	8.3	15.9	1.6	4.8	48	16.0	20.5	18.5	5.0	20.0
Jun	dec-17	33.4	16.9	25.1	56	8.2	15.8	1.6	4.8	48	11.5	7.0	25.0	10.0	4.0
	dec-18	33.0	17.2	25.1	59	7.8	15.1	1.6	4.6	46	15.4	25.0	36.5	0.0	0.0
	dec-19	32.4	17.8	25.1	62	7.2	14.1	1.6	4.3	43	10.8	5.0	13.0	10.0	15.0
Jul	dec-20	32.1	18.0	25.1	63	6.9	13.7	1.6	4.2	42	26.6	10.5	31.0	45.0	20.0
	dec-21	32.1	18.1	25.1	64	7.0	13.9	1.5	4.2	42	42.6	20.5	78.0	10.0	62.0
	dec-22	32.2	18.2	25.2	65	7.1	14.2	1.4	4.2	42	27.6	0.0	35.0	25.0	50.5
Aug	dec-23	32.3	18.2	25.3	66	7.1	14.3	1.4	4.2	42	16.0	25.0	4.0	0.0	35.0
	dec-24	32.2	17.6	24.9	64	7.4	14.7	1.3	4.2	42	19.4	18.5	19.0	0.0	40.0
	dec-25	32.1	16.8	24.4	62	7.7	15.1	1.3	4.3	43	26.5	5.0	6.0	0.0	95.0
Sep	dec-26	32.0	16.4	24.2	61	7.8	15.2	1.3	4.3	43	20.3	15.0	11.0	0.0	55.0
	dec-27	31.7	15.3	23.5	60	8.2	15.7	1.4	4.3	43	2.5	10.0	0.0	0.0	0.0
	dec-28	31.2	13.8	22.5	58	8.8	16.3	1.5	4.4	44	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	31.0	13.0	22.0	57	9.1	16.4	1.6	4.4	44	1.3	5.0	0.0	0.0	0.0
	dec-30	30.3	12.3	21.3	57	9.1	16.0	1.6	4.2	42	0.0	0.0	0.0	0.0	0.0
	dec-31	29.4	11.4	20.4	57	9.1	15.5	1.6	4.0	40	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	28.9	11.0	19.9	57	9.1	15.2	1.5	3.8	38	0.0	0.0	0.0	0.0	0.0
	dec-33	28.4	11.1	19.7	59	9.1	14.8	1.5	3.7	37	0.0	0.0	0.0	0.0	0.0
	dec-34	27.8	11.2	19.5	61	9.0	14.5	1.5	3.5	35	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	27.5	11.3	19.4	62	9.0	14.3	1.5	3.4	34	0.0	0.0	0.0	0.0	0.0
	dec-36	27.1	11.0	19.0	63	8.7	14.0	1.5	3.3	33	0.0	0.0	0.0	0.0	0.0
Year		30.3	14.6	22.4	61	8.3	5483	1.5	4.2	1506	556	613	524	428	662
										P/PET	0.4	0.4	0.3	0.3	0.4

station: Taiz (Osiferah) (agro-)meteorological
latitude: 13°36' average 1980-1991
longitude: 44°01'
altitude: 1400 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
	dec-1	27.4	13.3	20.3	62	8.7	14.5	1.6	3.7	37	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Jan	dec-2	27.1	13.2	20.1	64	8.6	14.7	1.7	3.7	37	1.5	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0
	dec-3	27.3	13.6	20.4	64	8.5	14.9	1.7	3.8	38	1.7	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	27.6	14.1	20.8	63	8.3	15.2	1.6	3.9	39	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.0	7.0
Feb	dec-5	27.8	14.3	21.0	63	8.2	15.5	1.6	4.0	40	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
	dec-6	28.4	15.1	21.8	60	8.2	15.9	1.7	4.3	43	1.7	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	3.0	0.0
	dec-7	29.3	16.2	22.8	56	8.3	16.3	1.7	4.6	46	3.6	12.0	0.0	8.0	0.0	0.0	0.0	6.0	5.0	0.0	0.0	0.0	12.0
Mar	dec-8	29.7	16.8	23.3	54	8.3	16.7	1.7	4.8	48	11.2	0.0	34.0	0.0	0.0	0.0	0.0	24.0	60.0	0.0	3.0	0.0	13.0
	dec-9	30.0	17.2	23.6	53	8.3	16.9	1.8	5.0	50	22.4	0.0	14.3	111.0	0.0	0.0	4.5	10.0	72.0	0.0	0.0	44.0	13.0
	dec-10	30.4	17.8	24.1	52	8.3	17.2	1.9	5.2	52	17.7	0.0	0.0	0.0	38.5	0.0	11.0	65.0	43.0	0.0	13.0	42.0	0.0
Apr	dec-11	30.5	18.0	24.3	52	8.3	17.2	1.9	5.3	53	27.7	60.5	42.1	14.0	89.0	0.0	10.5	0.0	78.0	23.0	0.0	15.0	0.0
	dec-12	31.2	18.3	24.8	52	8.4	17.3	1.7	5.2	52	15.4	27.0	12.2	0.0	15.0	0.0	7.0	28.0	0.0	0.0	70.0	12.0	13.0
	dec-13	32.1	18.7	25.4	52	8.4	17.3	1.4	5.1	51	13.9	0.0	10.6	50.0	1.0	23.0	8.0	0.0	2.0	7.0	26.0	23.0	16.0
May	dec-14	32.5	18.9	25.7	52	8.4	17.2	1.3	5.0	50	21.3	12.0	64.5	43.0	13.5	8.0	0.0	0.0	33.5	1.0	7.0	66.0	7.0
	dec-15	32.7	19.1	25.9	53	8.4	17.1	1.2	5.0	50	18.8	73.0	0.0	39.0	31.5	32.0	0.0	0.0	26.0	6.0	0.0	8.0	10.5
	dec-16	32.8	19.3	26.1	54	8.4	16.9	1.1	4.9	49	22.1	47.0	100.5	7.0	24.0	34.0	0.0	0.0	0.0	0.0	21.0	7.0	24.5
Jun	dec-17	32.9	19.4	26.2	54	8.4	16.9	1.1	4.8	48	17.7	7.0	14.9	3.0	0.0	0.0	0.0	40.0	0.0	49.0	21.0	18.0	59.0
	dec-18	32.6	19.5	26.1	55	7.9	16.4	1.1	4.7	47	15.8	0.0	16.3	9.5	22.5	22.0	45.0	0.0	0.0	19.0	35.0	12.0	8.0
	dec-19	32.3	19.5	25.9	56	7.4	15.7	1.1	4.6	46	16.0	10.0	0.0	0.0	0.0	29.0	27.5	0.0	28.0	0.0	41.0	52.0	4.5
Jul	dec-20	32.1	19.5	25.8	57	7.1	15.5	1.1	4.5	45	14.1	12.0	26.1	0.0	5.0	1.0	46.0	8.0	0.0	5.0	52.0	14.5	0.0
	dec-21	32.1	19.3	25.7	58	7.2	15.6	1.1	4.5	45	14.2	8.0	8.5	8.0	1.0	22.0	4.0	67.0	0.0	5.0	11.0	36.0	0.0
	dec-22	32.0	19.1	25.5	58	7.2	15.7	1.0	4.5	45	18.1	48.0	23.6	6.0	0.0	12.0	13.0	25.0	0.0	11.0	18.0	57.5	2.5
Aug	dec-23	32.0	18.9	25.5	59	7.3	15.8	0.9	4.4	44	11.3	21.0	24.0	6.0	0.0	18.0	8.0	18.0	6.0	3.0	29.0	0.0	3.0
	dec-24	32.0	18.4	25.2	57	7.5	16.1	1.0	4.5	45	35.0	13.0	37.0	43.0	52.0	83.0	0.0	44.0	22.5	23.0	46.0	44.0	12.0
	dec-25	31.9	17.6	24.7	56	7.8	16.4	1.1	4.5	45	27.6	28.0	63.3	66.0	3.0	45.0	10.0	7.0	1.0	32.0	26.0	34.5	15.0
Sep	dec-26	31.9	17.2	24.5	55	8.0	16.4	1.1	4.5	45	28.2	44.0	49.0	25.0	0.0	10.0	12.0	28.0	18.0	28.0	45.0	44.0	35.0
	dec-27	31.5	16.8	24.2	53	8.4	16.6	1.2	4.6	46	27.5	22.0	90.0	5.0	13.5	19.0	31.0	16.0	14.0	17.0	64.0	18.5	20.0
	dec-28	31.0	16.3	23.7	51	8.9	16.8	1.4	4.7	47	43.2	78.0	30.0	80.0	0.0	2.0	86.0	0.0	48.0	46.0	6.5	103.0	39.0
Oct	dec-29	30.8	16.1	23.4	50	9.1	16.7	1.5	4.7	47	17.9	59.0	17.0	0.0	0.0	0.0	9.0	7.0	32.0	25.0	40.0	21.0	5.0
	dec-30	30.2	15.6	22.9	50	9.1	16.2	1.6	4.5	45	6.9	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	45.0
	dec-31	29.4	15.0	22.2	51	9.0	15.7	1.6	4.3	43	6.9	0.0	0.0	14.0	0.0	0.0	36.0	0.0	0.0	0.0	0.0	33.0	0.0
Nov	dec-32	29.1	14.7	21.9	51	9.0	15.3	1.6	4.1	41	1.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0
	dec-33	28.7	14.3	21.5	54	9.0	15.0	1.6	4.0	40	2.7	8.0	0.0	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0
	dec-34	28.2	13.8	21.0	57	9.0	14.7	1.6	3.8	38	3.6	5.0	0.0	0.0	0.0	0.0	0.0	11.0	27.0	0.0	0.0	0.0	0.0
Dec	dec-35	28.0	13.5	20.7	59	9.0	14.6	1.6	3.7	37	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0
	dec-36	27.7	13.4	20.5	61	8.9	14.5	1.6	3.7	37	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.8
Year		30.4	16.7	23.5	56	8.3	5775	1.4	4.5	1611	492	600	691	576	330	360	369	404	522	339	582	760	372
										P/PET	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.4	0.5	0.2

station: Taiz (airport) (agro-)meteorological
latitude: 13°41' average 1987-1988
longitude: 44°08'
altitude: 1450 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)		
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1987	1988
	dec-1	24.7	11.2	17.9	66	8.2	13.8	2.0	3.4	34	0.3	0.5	0.0
Jan	dec-2	24.3	11.2	17.7	67	7.7	13.5	1.8	3.3	33	0.0	0.0	0.0
	dec-3	25.1	11.4	18.3	64	8.2	14.3	1.9	3.5	35	0.0	0.0	0.0
	dec-4	26.3	11.8	19.0	60	8.8	15.5	2.0	4.0	40	0.0	0.0	0.0
Feb	dec-5	26.9	12.0	19.4	59	9.1	16.3	2.0	4.2	42	4.0	7.4	0.5
	dec-6	27.6	12.7	20.1	61	9.0	16.6	2.1	4.4	44	2.6	1.7	3.4
	dec-7	28.5	13.7	21.1	64	8.8	16.8	2.3	4.6	46	2.7	5.4	0.0
Mar	dec-8	29.0	14.2	21.6	65	8.7	17.1	2.3	4.7	47	11.3	0.0	22.6
	dec-9	29.0	14.5	21.8	62	8.8	17.5	2.4	5.0	50	55.9	4.5	107.3
	dec-10	29.1	14.9	22.0	58	9.0	17.9	2.4	5.2	52	14.2	0.0	28.4
Apr	dec-11	29.2	15.2	22.2	57	9.1	18.1	2.5	5.3	53	15.7	31.4	0.0
	dec-12	29.9	15.8	22.8	57	8.8	17.9	2.4	5.4	54	5.4	10.7	0.0
	dec-13	30.8	16.6	23.7	58	8.5	17.5	2.4	5.4	54	15.5	4.6	26.3
May	dec-14	31.3	17.1	24.2	59	8.4	17.2	2.3	5.4	54	38.3	44.4	32.2
	dec-15	31.7	17.4	24.5	58	8.3	17.0	2.3	5.4	54	39.7	23.0	56.3
	dec-16	32.3	17.8	25.0	58	8.1	16.7	2.3	5.4	54	9.2	12.5	5.9
Jun	dec-17	32.6	18.0	25.3	58	8.0	16.5	2.3	5.4	54	28.5	55.4	1.6
	dec-18	32.3	18.3	25.3	58	7.6	16.0	2.3	5.3	53	6.1	3.5	8.7
	dec-19	32.0	18.7	25.4	57	7.0	15.4	2.2	5.2	52	4.9	3.7	6.0
Jul	dec-20	31.8	19.0	25.4	57	6.7	15.1	2.2	5.1	51	8.0	5.0	11.0
	dec-21	31.8	18.7	25.3	58	6.8	15.3	2.2	5.1	51	8.5	14.3	2.7
	dec-22	31.8	18.4	25.1	61	7.0	15.5	2.1	5.0	50	13.8	14.3	13.2
Aug	dec-23	31.8	18.3	25.0	62	7.1	15.6	2.1	4.9	49	35.7	49.2	22.1
	dec-24	31.5	17.8	24.7	62	7.3	15.8	2.0	4.9	49	32.0	53.6	10.4
	dec-25	31.1	17.2	24.2	61	7.6	16.0	1.9	4.8	48	19.4	29.0	9.8
Sep	dec-26	30.9	16.9	23.9	61	7.7	16.0	1.9	4.8	48	31.4	31.6	31.2
	dec-27	30.3	16.0	23.2	61	8.3	16.4	2.1	4.8	48	7.8	15.6	0.0
	dec-28	29.5	14.8	22.2	61	9.1	16.9	2.3	4.8	48	11.1	8.4	13.8
Oct	dec-29	29.1	14.3	21.7	61	9.5	16.9	2.5	4.8	48	9.0	9.5	8.5
	dec-30	28.5	12.9	20.7	59	9.6	16.6	2.4	4.6	46	0.0	0.0	0.0
	dec-31	27.6	11.1	19.4	57	9.7	16.2	2.3	4.3	43	0.0	0.0	0.0
Nov	dec-32	27.2	10.2	18.7	56	9.8	15.8	2.3	4.2	42	0.0	0.0	0.0
	dec-33	26.6	10.6	18.6	59	9.6	15.3	2.3	4.0	40	0.0	0.0	0.0
	dec-34	25.9	11.0	18.4	62	9.4	14.8	2.3	3.8	38	1.5	0.0	3.0
Dec	dec-35	25.5	11.3	18.4	64	9.3	14.6	2.3	3.7	37	0.0	0.0	0.0
	dec-36	25.1	11.2	18.2	65	8.7	14.1	2.1	3.5	35	2.9	0.0	5.7
Year		29.1	14.8	21.9	60	8.4	5785	2.2	4.7	1675	435	439	431
										P/PET	0.3	0.3	0.3

station: Warazan (agro-)meteorological
latitude: 13°25' average 1989, 1992-1993
longitude: 44°14
altitude: 1100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)			
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1989	1992	1993
	dec-1	26.5	13.9	20.2	50	7.8	13.6	1.6	3.7	37	0.7	1.0	1.0	0.0
Jan	dec-2	26.0	14.1	20.0	51	7.5	13.5	1.7	3.8	38	1.3	0.0	2.0	2.0
	dec-3	26.6	14.1	20.3	50	7.5	13.8	1.7	3.9	39	1.7	0.0	0.0	5.0
	dec-4	27.4	14.1	20.7	49	7.4	14.2	1.8	4.1	41	7.7	16.0	3.0	4.0
Feb	dec-5	27.9	14.1	21.0	49	7.4	14.6	1.8	4.3	43	2.0	0.0	4.0	2.0
	dec-6	28.6	14.6	21.6	45	8.0	15.7	1.8	4.6	46	2.7	0.0	8.0	0.0
	dec-7	29.7	15.3	22.5	40	8.8	16.9	1.9	5.1	51	0.0	0.0	0.0	0.0
Mar	dec-8	30.2	15.6	22.9	38	9.1	17.7	1.9	5.4	54	0.0	0.0	0.0	0.0
	dec-9	30.6	16.2	23.4	37	9.0	17.8	1.9	5.5	55	0.0	0.0	0.0	0.0
	dec-10	31.2	16.9	24.1	36	8.9	17.8	1.9	5.7	57	17.7	0.0	53.0	0.0
Apr	dec-11	31.5	17.3	24.4	35	8.8	17.8	1.9	5.7	57	6.3	0.0	2.0	17.0
	dec-12	32.7	18.0	25.3	34	9.2	18.2	1.9	5.9	59	4.3	0.0	0.0	13.0
	dec-13	34.3	18.9	26.6	32	9.7	18.7	1.8	6.2	62	9.0	0.0	4.0	23.0
May	dec-14	35.1	19.3	27.2	31	9.9	18.9	1.8	6.2	62	31.7	21.0	60.0	14.0
	dec-15	35.6	19.8	27.7	32	9.5	18.3	1.7	6.1	61	16.7	1.0	0.0	49.0
	dec-16	36.3	20.5	28.4	35	8.8	17.5	1.6	5.9	59	20.3	45.0	8.0	8.0
Jun	dec-17	36.6	20.8	28.7	36	8.5	17.1	1.6	5.8	58	21.0	21.0	21.0	21.0
	dec-18	36.4	21.0	28.7	34	8.2	16.6	1.6	5.8	58	28.7	2.0	42.0	42.0
	dec-19	36.0	21.1	28.6	32	7.7	16.1	1.8	5.9	59	17.0	0.0	37.0	14.0
Jul	dec-20	35.9	21.2	28.5	30	7.5	15.9	1.8	6.0	60	18.0	4.0	36.0	14.0
	dec-21	35.8	20.6	28.2	32	7.6	16.1	1.7	5.8	58	23.7	2.0	34.0	35.0
	dec-22	35.8	19.8	27.8	34	7.7	16.3	1.6	5.7	57	38.3	34.0	42.0	39.0
Aug	dec-23	35.8	19.4	27.6	35	7.8	16.4	1.6	5.6	56	41.7	73.0	31.0	21.0
	dec-24	35.3	19.1	27.2	37	7.9	16.6	1.5	5.4	54	28.0	7.0	45.0	32.0
	dec-25	34.7	18.8	26.8	40	8.2	16.8	1.4	5.2	52	25.7	6.0	36.0	35.0
Sep	dec-26	34.5	18.6	26.5	42	8.3	16.7	1.3	5.1	51	40.7	0.0	15.0	107.0
	dec-27	33.8	17.9	25.8	42	8.9	17.2	1.3	5.1	51	14.3	10.0	24.0	9.0
	dec-28	33.0	16.8	24.9	42	9.7	17.9	1.4	5.0	50	8.0	0.0	22.0	2.0
Oct	dec-29	32.6	16.3	24.4	42	10.2	17.9	1.4	5.0	50	17.7	0.0	0.0	53.0
	dec-30	31.6	15.5	23.5	44	10.2	17.5	1.4	4.7	47	8.3	0.0	0.0	25.0
	dec-31	30.2	14.4	22.3	47	10.2	17.0	1.5	4.5	45	0.0	0.0	0.0	0.0
Nov	dec-32	29.5	13.8	21.7	49	10.2	16.6	1.5	4.3	43	0.0	0.0	0.0	0.0
	dec-33	28.8	13.7	21.3	49	9.7	15.6	1.5	4.0	40	0.3	0.0	0.0	1.0
	dec-34	27.9	13.7	20.8	49	8.9	14.6	1.5	3.8	38	1.3	2.0	2.0	0.0
Dec	dec-35	27.4	13.6	20.5	49	8.5	14.1	1.5	3.7	37	3.3	10.0	0.0	0.0
	dec-36	26.9	13.8	20.4	49	8.2	13.8	1.6	3.7	37	0.3	0.0	1.0	0.0
Year		31.9	17.0	24.5	40	8.6	5922	1.6	5.1	1822	458	255	533	587
										P/PET	0.3	0.1	0.3	0.3

station: Dhala
latitude: 13°42'
longitude: 44°44'
altitude: 1150 m

(agro-)climatological
average 1973-1979, 1981-1987

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1976	1977	1978	1979	1981	1982	1983	1984	1985	1986	1987
	dec-1	23.7	13.1	18.4	62	7.9	13.5	0.8	2.9	29													
Jan	dec-2	23.5	12.9	18.2	63	7.5	13.3	0.9	2.9	29	4.5	0.0	0.0	4.1	0.0	0.0	0.0	19.7	0.0	0.0	0.0	17.8	4.5
	dec-3	23.9	13.1	18.5	61	8.3	14.5	0.9	3.2	32													
	dec-4	24.4	13.5	18.9	58	9.4	16.1	1.0	3.6	36													
Feb	dec-5	24.7	13.6	19.1	57	10.0	17.2	1.1	3.9	39	8.1	13.1	0.0	0.0	15.3	0.0	0.0	17.5	50.0	0.0	0.0	10.0	8.1
	dec-6	25.4	14.3	19.9	57	10.0	17.7	1.0	4.0	40													
	dec-7	26.4	15.3	20.8	58	10.1	18.2	0.8	4.1	41													
Mar	dec-8	26.8	15.8	21.3	58	10.1	18.6	0.7	4.2	42	36.9	0.0	11.0	0.0	0.0	0.0	114.7	280.0	6.5	0.0	0.0	16.0	83.0
	dec-9	27.2	16.0	21.6	56	9.7	18.4	0.7	4.3	43													
	dec-10	27.7	16.4	22.1	53	9.2	18.0	0.7	4.3	43													
Apr	dec-11	27.9	16.6	22.3	52	8.9	17.7	0.7	4.3	43	48.5	37.9	115.5	33.9	13.0	2.8	52.2	43.5	66.2	197.5	21.5	45.0	48.5
	dec-12	28.6	17.0	22.8	51	8.5	17.2	0.8	4.4	44													
	dec-13	29.5	17.6	23.5	51	7.9	16.5	0.8	4.3	43													
May	dec-14	29.9	17.8	23.9	51	7.6	16.1	0.9	4.3	43	37.9	31.2	65.2	170.5	46.6	10.4	0.0	9.2	32.5	35.5	20.0	6.5	37.9
	dec-15	30.7	18.6	24.6	50	7.5	15.9	0.8	4.3	43													
	dec-16	31.8	19.5	25.7	48	7.4	15.6	0.7	4.3	43													
Jun	dec-17	32.3	20.0	26.2	48	7.3	15.5	0.7	4.3	43	24.0	43.3	0.0	47.5	24.6	0.0	29.8	3.0	6.5	38.0	11.9	7.5	24.0
	dec-18	31.9	20.1	26.0	50	7.6	15.8	0.7	4.3	43													
	dec-19	31.3	20.2	25.7	52	8.0	16.3	0.7	4.4	44													
Jul	dec-20	31.0	20.2	25.6	54	8.2	16.6	0.7	4.4	44	74.9	51.7	39.6	80.8	157.8	22.3	102.8	61.3	50.0	154.4	15.5	7.0	48.5
	dec-21	30.9	20.1	25.5	54	8.0	16.4	0.7	4.4	44													
	dec-22	30.6	19.9	25.3	53	7.8	16.3	0.7	4.3	43													
Aug	dec-23	30.5	19.8	25.2	53	7.7	16.2	0.7	4.3	43	91.6	163.8	101.7	89.1	216.1	58.8	58.2	46.2	6.3	30.0	66.6	170.4	37.9
	dec-24	30.2	19.3	24.8	54	8.0	16.5	0.7	4.3	43													
	dec-25	29.9	18.6	24.2	55	8.5	16.9	0.7	4.3	43													
Sep	dec-26	29.7	18.3	24.0	56	8.7	17.0	0.7	4.3	43	34.6	137.2	5.7	20.2	0.0	10.0	36.9	32.3	45.5	0.0	12.8	69.5	24.0
	dec-27	28.9	17.4	23.1	54	9.4	17.6	0.7	4.3	43													
	dec-28	27.8	16.2	22.0	51	10.4	18.3	0.8	4.2	42													
Oct	dec-29	27.3	15.6	21.5	50	10.9	18.4	0.8	4.1	41	14.2	0.0	0.0	83.7	0.0	0.0	0.0	26.0	0.0	0.0	0.0	11.5	77.0
	dec-30	26.9	14.8	20.8	51	10.2	17.2	0.8	3.8	38													
	dec-31	26.3	13.8	20.0	52	9.2	15.6	0.7	3.4	34													
Nov	dec-32	26.0	13.3	19.6	53	8.7	14.8	0.7	3.2	32	8.8	0.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0	95.7
	dec-33	25.4	13.4	19.4	55	8.7	14.4	0.7	3.1	31													
	dec-34	24.6	13.5	19.1	58	8.7	14.2	0.7	3.0	30													
Dec	dec-35	24.2	13.5	18.9	60	8.7	14.1	0.7	2.9	29	9.2	0.0	0.0	0.0	0.0	0.0	0.0	58.2	0.0	0.0	0.0	35.5	35.4
	dec-36	24.0	13.3	18.7	61	8.3	13.7	0.7	2.9	29													
Year		27.8	16.5	22.1	54	8.7	5864	0.8	3.9	1416	393	478	339	530	473	104	395	624	264	455	148	397	525
										P/PET	0.3	0.3	0.2	0.4	0.3	0.1	0.3	0.4	0.2	0.3	0.1	0.3	0.4

station: Warazan (agro-)meteorological
latitude: 13°25' average 1989, 1992-1993
longitude: 44°14
altitude: 1100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)			
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1989	1992	1993
	dec-1	26.5	13.9	20.2	50	7.8	13.6	1.6	3.7	37	0.7	1.0	1.0	0.0
Jan	dec-2	26.0	14.1	20.0	51	7.5	13.5	1.7	3.8	38	1.3	0.0	2.0	2.0
	dec-3	26.6	14.1	20.3	50	7.5	13.8	1.7	3.9	39	1.7	0.0	0.0	5.0
	dec-4	27.4	14.1	20.7	49	7.4	14.2	1.8	4.1	41	7.7	16.0	3.0	4.0
Feb	dec-5	27.9	14.1	21.0	49	7.4	14.6	1.8	4.3	43	2.0	0.0	4.0	2.0
	dec-6	28.6	14.6	21.6	45	8.0	15.7	1.8	4.6	46	2.7	0.0	8.0	0.0
	dec-7	29.7	15.3	22.5	40	8.8	16.9	1.9	5.1	51	0.0	0.0	0.0	0.0
Mar	dec-8	30.2	15.6	22.9	38	9.1	17.7	1.9	5.4	54	0.0	0.0	0.0	0.0
	dec-9	30.6	16.2	23.4	37	9.0	17.8	1.9	5.5	55	0.0	0.0	0.0	0.0
	dec-10	31.2	16.9	24.1	36	8.9	17.8	1.9	5.7	57	17.7	0.0	53.0	0.0
Apr	dec-11	31.5	17.3	24.4	35	8.8	17.8	1.9	5.7	57	6.3	0.0	2.0	17.0
	dec-12	32.7	18.0	25.3	34	9.2	18.2	1.9	5.9	59	4.3	0.0	0.0	13.0
	dec-13	34.3	18.9	26.6	32	9.7	18.7	1.8	6.2	62	9.0	0.0	4.0	23.0
May	dec-14	35.1	19.3	27.2	31	9.9	18.9	1.8	6.2	62	31.7	21.0	60.0	14.0
	dec-15	35.6	19.8	27.7	32	9.5	18.3	1.7	6.1	61	16.7	1.0	0.0	49.0
	dec-16	36.3	20.5	28.4	35	8.8	17.5	1.6	5.9	59	20.3	45.0	8.0	8.0
Jun	dec-17	36.6	20.8	28.7	36	8.5	17.1	1.6	5.8	58	21.0	21.0	21.0	21.0
	dec-18	36.4	21.0	28.7	34	8.2	16.6	1.6	5.8	58	28.7	2.0	42.0	42.0
	dec-19	36.0	21.1	28.6	32	7.7	16.1	1.8	5.9	59	17.0	0.0	37.0	14.0
Jul	dec-20	35.9	21.2	28.5	30	7.5	15.9	1.8	6.0	60	18.0	4.0	36.0	14.0
	dec-21	35.8	20.6	28.2	32	7.6	16.1	1.7	5.8	58	23.7	2.0	34.0	35.0
	dec-22	35.8	19.8	27.8	34	7.7	16.3	1.6	5.7	57	38.3	34.0	42.0	39.0
Aug	dec-23	35.8	19.4	27.6	35	7.8	16.4	1.6	5.6	56	41.7	73.0	31.0	21.0
	dec-24	35.3	19.1	27.2	37	7.9	16.6	1.5	5.4	54	28.0	7.0	45.0	32.0
	dec-25	34.7	18.8	26.8	40	8.2	16.8	1.4	5.2	52	25.7	6.0	36.0	35.0
Sep	dec-26	34.5	18.6	26.5	42	8.3	16.7	1.3	5.1	51	40.7	0.0	15.0	107.0
	dec-27	33.8	17.9	25.8	42	8.9	17.2	1.3	5.1	51	14.3	10.0	24.0	9.0
	dec-28	33.0	16.8	24.9	42	9.7	17.9	1.4	5.0	50	8.0	0.0	22.0	2.0
Oct	dec-29	32.6	16.3	24.4	42	10.2	17.9	1.4	5.0	50	17.7	0.0	0.0	53.0
	dec-30	31.6	15.5	23.5	44	10.2	17.5	1.4	4.7	47	8.3	0.0	0.0	25.0
	dec-31	30.2	14.4	22.3	47	10.2	17.0	1.5	4.5	45	0.0	0.0	0.0	0.0
Nov	dec-32	29.5	13.8	21.7	49	10.2	16.6	1.5	4.3	43	0.0	0.0	0.0	0.0
	dec-33	28.8	13.7	21.3	49	9.7	15.6	1.5	4.0	40	0.3	0.0	0.0	1.0
	dec-34	27.9	13.7	20.8	49	8.9	14.6	1.5	3.8	38	1.3	2.0	2.0	0.0
Dec	dec-35	27.4	13.6	20.5	49	8.5	14.1	1.5	3.7	37	3.3	10.0	0.0	0.0
	dec-36	26.9	13.8	20.4	49	8.2	13.8	1.6	3.7	37	0.3	0.0	1.0	0.0
Year		31.9	17.0	24.5	40	8.6	5922	1.6	5.1	1822	458	255	533	587
										P/PET	0.3	0.1	0.3	0.3

station: Dhala
latitude: 13°42'
longitude: 44°44'
altitude: 1150 m

(agro-)climatological
average 1973-1979, 1981-1987

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1976	1977	1978	1979	1981	1982	1983	1984	1985	1986	1987
	dec-1	23.7	13.1	18.4	62	7.9	13.5	0.8	2.9	29													
Jan	dec-2	23.5	12.9	18.2	63	7.5	13.3	0.9	2.9	29	4.5	0.0	0.0	4.1	0.0	0.0	0.0	19.7	0.0	0.0	0.0	17.8	4.5
	dec-3	23.9	13.1	18.5	61	8.3	14.5	0.9	3.2	32													
	dec-4	24.4	13.5	18.9	58	9.4	16.1	1.0	3.6	36													
Feb	dec-5	24.7	13.6	19.1	57	10.0	17.2	1.1	3.9	39	8.1	13.1	0.0	0.0	15.3	0.0	0.0	17.5	50.0	0.0	0.0	10.0	8.1
	dec-6	25.4	14.3	19.9	57	10.0	17.7	1.0	4.0	40													
	dec-7	26.4	15.3	20.8	58	10.1	18.2	0.8	4.1	41													
Mar	dec-8	26.8	15.8	21.3	58	10.1	18.6	0.7	4.2	42	36.9	0.0	11.0	0.0	0.0	0.0	114.7	280.0	6.5	0.0	0.0	16.0	83.0
	dec-9	27.2	16.0	21.6	56	9.7	18.4	0.7	4.3	43													
	dec-10	27.7	16.4	22.1	53	9.2	18.0	0.7	4.3	43													
Apr	dec-11	27.9	16.6	22.3	52	8.9	17.7	0.7	4.3	43	48.5	37.9	115.5	33.9	13.0	2.8	52.2	43.5	66.2	197.5	21.5	45.0	48.5
	dec-12	28.6	17.0	22.8	51	8.5	17.2	0.8	4.4	44													
	dec-13	29.5	17.6	23.5	51	7.9	16.5	0.8	4.3	43													
May	dec-14	29.9	17.8	23.9	51	7.6	16.1	0.9	4.3	43	37.9	31.2	65.2	170.5	46.6	10.4	0.0	9.2	32.5	35.5	20.0	6.5	37.9
	dec-15	30.7	18.6	24.6	50	7.5	15.9	0.8	4.3	43													
	dec-16	31.8	19.5	25.7	48	7.4	15.6	0.7	4.3	43													
Jun	dec-17	32.3	20.0	26.2	48	7.3	15.5	0.7	4.3	43	24.0	43.3	0.0	47.5	24.6	0.0	29.8	3.0	6.5	38.0	11.9	7.5	24.0
	dec-18	31.9	20.1	26.0	50	7.6	15.8	0.7	4.3	43													
	dec-19	31.3	20.2	25.7	52	8.0	16.3	0.7	4.4	44													
Jul	dec-20	31.0	20.2	25.6	54	8.2	16.6	0.7	4.4	44	74.9	51.7	39.6	80.8	157.8	22.3	102.8	61.3	50.0	154.4	15.5	7.0	48.5
	dec-21	30.9	20.1	25.5	54	8.0	16.4	0.7	4.4	44													
	dec-22	30.6	19.9	25.3	53	7.8	16.3	0.7	4.3	43													
Aug	dec-23	30.5	19.8	25.2	53	7.7	16.2	0.7	4.3	43	91.6	163.8	101.7	89.1	216.1	58.8	58.2	46.2	6.3	30.0	66.6	170.4	37.9
	dec-24	30.2	19.3	24.8	54	8.0	16.5	0.7	4.3	43													
	dec-25	29.9	18.6	24.2	55	8.5	16.9	0.7	4.3	43													
Sep	dec-26	29.7	18.3	24.0	56	8.7	17.0	0.7	4.3	43	34.6	137.2	5.7	20.2	0.0	10.0	36.9	32.3	45.5	0.0	12.8	69.5	24.0
	dec-27	28.9	17.4	23.1	54	9.4	17.6	0.7	4.3	43													
	dec-28	27.8	16.2	22.0	51	10.4	18.3	0.8	4.2	42													
Oct	dec-29	27.3	15.6	21.5	50	10.9	18.4	0.8	4.1	41	14.2	0.0	0.0	83.7	0.0	0.0	0.0	26.0	0.0	0.0	0.0	11.5	77.0
	dec-30	26.9	14.8	20.8	51	10.2	17.2	0.8	3.8	38													
	dec-31	26.3	13.8	20.0	52	9.2	15.6	0.7	3.4	34													
Nov	dec-32	26.0	13.3	19.6	53	8.7	14.8	0.7	3.2	32	8.8	0.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0	95.7
	dec-33	25.4	13.4	19.4	55	8.7	14.4	0.7	3.1	31													
	dec-34	24.6	13.5	19.1	58	8.7	14.2	0.7	3.0	30													
Dec	dec-35	24.2	13.5	18.9	60	8.7	14.1	0.7	2.9	29	9.2	0.0	0.0	0.0	0.0	0.0	0.0	58.2	0.0	0.0	0.0	35.5	35.4
	dec-36	24.0	13.3	18.7	61	8.3	13.7	0.7	2.9	29													
Year		27.8	16.5	22.1	54	8.7	5864	0.8	3.9	1416	393	478	339	530	473	104	395	624	264	455	148	397	525
										P/PET	0.3	0.3	0.2	0.4	0.3	0.1	0.3	0.4	0.2	0.3	0.1	0.3	0.4

station: Al Sanam rainfall
latitude: 14°32' average 1979-1981, 1983-1984, 1986
longitude: 44°16'
altitude: 2000 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)						
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1979	1980	1981	1983	1984	1986
	dec-1	24.2	8.4	16.3	65	8.4	14.3	1.5	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	23.8	8.4	16.1	66	8.1	14.4	1.5	3.2	32	0.3	0.0	0.0	1.5	0.0	0.0	0.0
	dec-3	24.2	9.3	16.8	65	8.2	14.8	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	24.9	10.5	17.7	63	8.3	15.4	1.6	3.7	37	3.0	8.0	0.0	0.0	0.0	0.0	10.0
Feb	dec-5	25.2	11.1	18.2	63	8.3	15.9	1.6	3.9	39	12.1	9.0	0.0	0.0	47.0	0.0	16.8
	dec-6	25.9	11.4	18.7	62	8.3	16.4	1.6	4.1	41	19.3	0.0	1.7	0.0	95.0	0.0	18.8
	dec-7	26.8	11.8	19.3	61	8.3	16.8	1.7	4.3	43	6.7	10.0	0.0	0.0	0.0	0.0	30.2
Mar	dec-8	27.2	12.0	19.6	60	8.3	17.1	1.7	4.5	45	31.8	11.0	89.0	20.0	26.0	40.0	5.0
	dec-9	27.4	12.7	20.0	60	8.4	17.5	1.7	4.6	46	16.2	0.0	23.0	0.0	43.0	15.0	16.0
	dec-10	27.6	13.6	20.6	60	8.5	17.9	1.7	4.7	47	25.5	6.0	0.0	0.0	125.0	0.0	21.7
Apr	dec-11	27.7	14.0	20.9	59	8.6	18.1	1.7	4.8	48	23.3	37.0	0.0	0.0	19.0	3.0	80.7
	dec-12	28.8	14.6	21.7	58	8.6	18.1	1.6	4.9	49	18.7	0.0	32.0	0.0	63.0	0.0	16.9
	dec-13	30.3	15.3	22.8	57	8.6	18.0	1.6	5.1	51	21.2	38.0	29.0	0.0	5.0	0.0	55.2
May	dec-14	31.1	15.7	23.4	57	8.5	18.0	1.6	5.1	51	12.5	12.0	13.0	0.0	50.0	0.0	0.0
	dec-15	31.6	15.6	23.6	57	8.4	17.8	1.6	5.1	51	8.2	0.0	0.0	0.0	49.3	0.0	0.0
	dec-16	32.3	15.4	23.9	56	8.3	17.6	1.6	5.1	51	1.0	0.0	0.0	0.0	0.0	0.0	6.0
Jun	dec-17	32.6	15.4	24.0	56	8.2	17.4	1.6	5.1	51	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	31.8	15.7	23.8	59	7.8	17.0	1.6	5.0	50	0.7	0.0	4.0	0.0	0.0	0.0	0.0
	dec-19	30.7	16.3	23.5	62	7.2	16.4	1.6	4.8	48	7.2	27.0	0.0	0.0	0.0	0.0	16.0
Jul	dec-20	30.2	16.5	23.4	63	6.9	16.1	1.6	4.7	47	6.8	22.0	0.0	9.0	0.0	0.0	10.0
	dec-21	30.1	16.6	23.3	64	7.0	16.2	1.5	4.7	47	11.9	34.0	4.5	0.0	11.0	0.0	21.9
	dec-22	29.9	16.7	23.3	65	7.1	16.4	1.4	4.6	46	14.5	0.0	17.0	12.0	9.0	0.0	49.2
Aug	dec-23	29.8	16.7	23.3	66	7.1	16.4	1.4	4.6	46	15.7	0.0	34.0	10.0	16.0	22.0	12.0
	dec-24	29.7	16.1	22.9	64	7.4	16.6	1.3	4.6	46	30.0	14.0	31.0	10.0	60.0	21.0	43.8
	dec-25	29.6	15.3	22.4	62	7.7	16.8	1.3	4.6	46	19.8	17.0	23.0	79.0	0.0	0.0	0.0
Sep	dec-26	29.5	14.9	22.2	61	7.8	16.7	1.3	4.5	45	9.5	26.0	22.0	0.0	0.0	9.0	0.0
	dec-27	29.0	13.3	21.1	60	8.2	16.9	1.4	4.4	44	1.0	0.0	6.0	0.0	0.0	0.0	0.0
	dec-28	28.2	11.1	19.7	58	8.8	17.1	1.5	4.4	44	6.4	0.0	9.5	12.0	0.0	17.0	0.0
Oct	dec-29	27.8	10.0	18.9	57	9.1	16.9	1.6	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	26.9	9.3	18.1	57	9.1	16.4	1.6	4.0	40	4.3	0.0	0.0	26.0	0.0	0.0	0.0
	dec-31	25.8	8.4	17.1	57	9.1	15.9	1.6	3.7	37	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	25.2	8.0	16.6	57	9.1	15.5	1.5	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	25.1	8.1	16.6	59	9.1	15.1	1.5	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	25.0	8.2	16.6	61	9.0	14.8	1.5	3.3	33	1.2	0.0	0.0	7.0	0.0	0.0	0.0
Dec	dec-35	25.0	8.3	16.6	62	9.0	14.6	1.5	3.3	33	2.4	0.0	1.5	13.0	0.0	0.0	0.0
	dec-36	24.6	8.4	16.5	63	8.7	14.4	1.5	3.2	32	1.5	0.0	0.0	0.0	0.0	9.0	0.0
Year		27.9	12.6	20.3	61	8.3	5915	1.5	4.3	1547	333	271	340	200	618	136	430
										P/PET	0.2	0.2	0.2	0.1	0.4	0.1	0.3

station: Al Masna'ah rainfall
latitude: 14°39' average 1978-1979, 1981-1983, 1986
longitude: 44°15'
altitude: 2000 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)						
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1978	1979	1981	1982	1983	1986
	dec-1	24.2	8.4	16.3	65	8.4	14.3	1.5	3.2	32	2.4	0.0	14.5	0.0	0.0	0.0	0.0
Jan	dec-2	23.8	8.4	16.1	66	8.1	14.3	1.5	3.2	32	4.7	5.4	0.0	0.0	15.5	0.0	7.0
	dec-3	24.2	9.3	16.8	65	8.2	14.8	1.6	3.4	34	4.2	0.0	11.0	0.0	0.0	0.0	14.0
	dec-4	24.9	10.5	17.7	63	8.3	15.3	1.6	3.7	37	9.7	0.0	0.0	0.0	0.0	34.0	24.0
Feb	dec-5	25.2	11.1	18.2	63	8.3	15.9	1.6	3.9	39	9.4	10.0	0.0	0.0	1.2	25.0	20.0
	dec-6	25.9	11.4	18.7	62	8.3	16.3	1.6	4.1	41	3.5	21.0	0.0	0.0	0.0	0.0	0.0
	dec-7	26.8	11.8	19.3	61	8.3	16.7	1.7	4.3	43	11.6	0.0	0.0	45.2	5.1	0.0	19.0
Mar	dec-8	27.2	12.0	19.6	60	8.3	17.1	1.7	4.5	45	9.6	0.0	0.0	6.5	0.0	12.0	39.0
	dec-9	27.4	12.7	20.0	60	8.4	17.5	1.7	4.6	46	25.4	68.0	0.0	35.8	15.5	1.0	32.0
	dec-10	27.6	13.6	20.6	60	8.5	17.9	1.7	4.7	47	21.0	12.5	20.0	29.6	24.6	17.5	22.0
Apr	dec-11	27.7	14.0	20.9	59	8.6	18.1	1.7	4.8	48	17.8	17.2	17.0	13.5	2.0	57.0	0.0
	dec-12	28.8	14.6	21.7	58	8.6	18.1	1.6	4.9	49	12.7	0.0	0.0	0.0	20.0	56.1	0.0
	dec-13	30.3	15.3	22.8	57	8.6	18.0	1.6	5.1	51	25.2	63.3	47.0	30.6	3.3	7.0	0.0
May	dec-14	31.1	15.7	23.4	57	8.5	18.0	1.6	5.1	51	3.4	0.0	0.0	2.6	2.6	12.0	3.0
	dec-15	31.6	15.6	23.6	57	8.4	17.8	1.6	5.1	51	1.7	3.5	0.0	0.0	0.0	6.5	0.0
	dec-16	32.3	15.4	23.9	56	8.3	17.6	1.6	5.1	51	15.1	0.0	90.4	0.3	0.0	0.0	0.0
Jun	dec-17	32.6	15.4	24.0	56	8.2	17.4	1.6	5.1	51	2.2	0.0	13.0	0.0	0.0	0.0	0.0
	dec-18	31.8	15.7	23.8	59	7.8	17.0	1.6	5.0	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	30.7	16.3	23.5	62	7.2	16.4	1.6	4.8	48	6.5	10.0	0.0	12.0	13.2	3.6	0.0
Jul	dec-20	30.2	16.5	23.4	63	6.9	16.1	1.6	4.7	47	26.9	157.0	0.0	0.0	4.5	0.0	0.0
	dec-21	30.1	16.6	23.3	64	7.0	16.2	1.5	4.7	47	11.3	0.0	0.0	19.9	20.0	0.0	28.0
	dec-22	29.9	16.7	23.3	65	7.1	16.4	1.4	4.6	46	15.2	0.0	0.0	39.0	20.0	0.0	32.0
Aug	dec-23	29.8	16.7	23.3	66	7.1	16.4	1.4	4.6	46	16.2	0.0	0.0	85.5	0.0	4.7	7.0
	dec-24	29.7	16.1	22.9	64	7.4	16.6	1.3	4.6	46	13.7	15.0	0.0	26.0	1.1	4.6	35.7
	dec-25	29.6	15.3	22.4	62	7.7	16.8	1.3	4.6	46	8.8	0.0	44.0	5.0	0.0	0.0	4.0
Sep	dec-26	29.5	14.9	22.2	61	7.8	16.7	1.3	4.5	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-27	29.0	13.3	21.1	60	8.2	16.9	1.4	4.4	44	4.9	0.0	21.5	0.0	7.8	0.0	0.0
	dec-28	28.2	11.1	19.7	58	8.8	17.1	1.5	4.3	43	10.2	30.0	31.0	0.0	0.0	0.0	0.0
Oct	dec-29	27.8	10.0	18.9	57	9.1	16.9	1.6	4.2	42	5.7	0.0	32.0	0.0	2.1	0.0	0.0
	dec-30	26.9	9.3	18.1	57	9.1	16.4	1.6	4.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	25.8	8.4	17.1	57	9.1	15.9	1.6	3.7	37	6.0	36.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	25.2	8.0	16.6	57	9.1	15.5	1.5	3.6	36	6.3	32.0	0.0	0.0	5.5	0.0	0.0
	dec-33	25.1	8.1	16.6	59	9.1	15.1	1.5	3.4	34	12.0	0.0	2.0	0.0	70.0	0.0	0.0
	dec-34	25.0	8.2	16.6	61	9.0	14.8	1.5	3.3	33	11.4	25.0	0.0	0.0	29.5	0.0	14.0
Dec	dec-35	25.0	8.3	16.6	62	9.0	14.6	1.5	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	24.6	8.4	16.5	63	8.7	14.4	1.5	3.2	32	20.8	115.0	3.0	0.0	7.0	0.0	0.0
Year		27.9	12.6	20.3	61	8.3	5913	1.5	4.3	1546	355	621	346	352	271	241	301
										P/PET	0.2	0.4	0.2	0.2	0.2	0.2	0.2

station: Habaka
latitude: 14°27'
longitude: 43°43'
altitude: 900 m

rainfall
average 1978-1981, 1986

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1978	1979	1980	1981	1986
	dec-1	29.7	13.5	21.6	65	8.4	14.4	1.5	3.7	37	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	29.3	12.8	21.1	66	8.1	14.4	1.5	3.7	37	1.3	0.0	6.6	0.0	0.0	0.0
	dec-3	29.9	13.4	21.6	65	8.2	14.8	1.6	3.9	39	6.2	0.0	31.0	0.0	0.0	0.0
	dec-4	30.6	14.1	22.4	63	8.3	15.4	1.6	4.1	41	3.0	15.0	0.0	0.0	0.0	0.0
Feb	dec-5	31.0	14.4	22.7	63	8.3	15.9	1.6	4.4	44	0.0	0.0	0.0	0.0	0.0	0.0
	dec-6	31.7	15.1	23.4	62	8.3	16.4	1.6	4.6	46	0.0	0.0	0.0	0.0	0.0	0.0
	dec-7	32.7	16.0	24.3	61	8.3	16.8	1.7	4.9	49	0.0	0.0	0.0	0.0	0.0	0.0
Mar	dec-8	33.2	16.4	24.8	60	8.3	17.2	1.7	5.1	51	19.0	0.0	2.0	0.0	93.1	0.0
	dec-9	33.3	16.7	25.0	60	8.4	17.6	1.7	5.2	52	18.0	0.0	66.0	0.0	24.0	0.0
	dec-10	33.4	17.1	25.2	60	8.5	17.9	1.7	5.3	53	2.9	14.4	0.0	0.0	0.0	0.0
Apr	dec-11	33.4	17.3	25.4	59	8.6	18.1	1.7	5.4	54	18.7	25.3	0.0	0.0	68.0	0.0
	dec-12	33.5	17.9	25.7	58	8.6	18.1	1.6	5.4	54	5.5	0.0	0.0	27.5	0.0	0.0
	dec-13	33.7	18.6	26.1	57	8.6	18.0	1.6	5.4	54	22.6	50.0	14.3	5.0	23.5	20.4
May	dec-14	33.7	19.0	26.4	57	8.5	18.0	1.6	5.5	55	7.9	6.0	0.0	0.0	33.4	0.0
	dec-15	33.9	18.9	26.4	57	8.4	17.8	1.6	5.4	54	0.9	0.0	4.5	0.0	0.0	0.0
	dec-16	34.2	18.7	26.5	56	8.3	17.5	1.6	5.4	54	23.0	0.0	13.6	5.0	5.9	90.3
Jun	dec-17	34.4	18.7	26.5	56	8.2	17.4	1.6	5.4	54	4.0	0.0	0.0	0.0	0.0	20.0
	dec-18	34.4	19.0	26.7	59	7.8	16.9	1.6	5.3	53	9.0	0.0	20.0	0.0	14.8	10.0
	dec-19	34.4	19.6	27.0	62	7.2	16.4	1.6	5.1	51	19.4	19.1	0.0	0.0	34.0	44.0
Jul	dec-20	34.4	19.8	27.1	63	6.9	16.1	1.6	5.1	51	50.2	111.0	53.0	47.0	39.8	0.0
	dec-21	34.6	19.9	27.3	64	7.0	16.2	1.5	5.1	51	28.1	78.0	38.0	0.0	15.9	8.4
	dec-22	35.0	20.0	27.5	65	7.1	16.4	1.4	5.0	50	20.9	0.0	12.0	0.0	80.0	12.7
Aug	dec-23	35.2	20.0	27.6	66	7.1	16.4	1.4	5.0	50	28.4	0.0	43.2	20.0	6.9	72.1
	dec-24	35.2	19.4	27.3	64	7.4	16.6	1.3	5.0	50	29.1	0.0	50.0	29.2	66.3	0.0
	dec-25	35.1	18.6	26.8	62	7.7	16.8	1.3	5.0	50	14.8	57.0	17.2	0.0	0.0	0.0
Sep	dec-26	35.0	18.2	26.6	61	7.8	16.7	1.3	4.9	49	11.1	0.0	35.2	0.0	13.5	6.6
	dec-27	34.9	17.7	26.3	60	8.2	16.9	1.4	5.0	50	5.4	0.0	0.0	27.0	0.0	0.0
	dec-28	34.8	17.0	25.9	58	8.8	17.1	1.5	5.0	50	0.0	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	34.7	16.6	25.7	57	9.1	16.9	1.6	5.0	50	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	34.3	15.9	25.1	57	9.1	16.5	1.6	4.8	48	3.8	0.0	0.0	19.0	0.0	0.0
	dec-31	33.7	15.0	24.3	57	9.1	16.0	1.6	4.5	45	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	33.3	14.6	23.9	57	9.1	15.5	1.5	4.3	43	5.3	2.0	0.0	24.5	0.0	0.0
	dec-33	32.4	14.7	23.5	59	9.1	15.1	1.5	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	31.1	14.8	23.0	61	9.0	14.8	1.5	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	30.5	14.9	22.7	62	9.0	14.7	1.5	3.8	38	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	30.1	14.2	22.1	63	8.7	14.5	1.5	3.8	38	0.0	0.0	0.0	0.0	0.0	0.0
Year		33.2	16.9	25.0	61	8.3	5920	1.5	4.8	1725	358	378	407	204	519	285
										P/PET	0.2	0.2	0.2	0.1	0.3	0.2

station: Dhamar (agro-)meteorological
latitude: 14°21' average 1987-1992
longitude: 44°20'
altitude: 2400 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1987	1988	1990	1991	1992
	dec-1	22.3	2.9	12.6	48	9.4	15.0	1.3	3.1	31	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	22.3	2.9	12.6	51	9.5	15.3	1.3	3.1	31	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	22.3	4.0	13.1	48	9.2	15.4	1.4	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	22.3	5.4	13.8	44	8.8	15.5	1.7	3.6	36	3.6	0.0	0.0	18.0	0.0	0.0
Feb	dec-5	22.3	6.1	14.2	43	8.7	15.8	1.8	3.8	38	1.0	0.0	0.0	3.0	2.0	0.0
	dec-6	23.1	6.8	15.0	44	8.8	16.5	1.7	4.0	40	10.0	13.2	0.0	18.0	19.0	0.0
	dec-7	24.1	7.8	16.0	45	9.1	17.1	1.6	4.2	42	25.2	69.2	9.0	9.0	39.0	0.0
Mar	dec-8	24.6	8.3	16.5	46	9.2	17.7	1.6	4.3	43	10.0	23.0	0.0	3.0	18.0	6.0
	dec-9	24.6	8.8	16.7	47	9.1	17.8	1.6	4.4	44	39.0	24.8	0.0	96.0	32.0	42.0
	dec-10	24.5	9.3	16.9	47	9.0	17.9	1.7	4.5	45	23.6	65.0	0.0	13.0	28.0	12.0
Apr	dec-11	24.5	9.6	17.0	48	8.9	17.9	1.7	4.5	45	13.7	21.5	42.0	0.0	5.0	0.0
	dec-12	25.2	9.9	17.6	46	9.1	18.2	1.7	4.7	47	7.3	0.0	8.4	16.0	0.0	12.0
	dec-13	26.2	10.4	18.3	43	9.3	18.4	1.8	4.9	49	16.6	18.2	0.0	6.0	27.0	32.0
May	dec-14	26.7	10.6	18.6	42	9.5	18.5	1.8	5.0	50	8.4	1.0	5.8	6.0	0.0	29.0
	dec-15	27.1	10.9	19.0	41	9.4	18.3	1.8	5.0	50	1.2	5.0	0.0	1.0	0.0	0.0
	dec-16	27.7	11.3	19.5	39	9.4	18.1	1.8	5.1	51	0.5	2.4	0.0	0.0	0.0	0.0
Jun	dec-17	28.0	11.5	19.7	38	9.3	18.1	1.8	5.1	51	9.7	12.5	32.0	0.0	4.0	0.0
	dec-18	27.7	11.6	19.7	40	8.9	17.5	1.9	5.0	50	1.8	0.0	0.0	0.0	4.0	5.0
	dec-19	27.4	11.7	19.6	42	8.3	16.9	2.0	4.9	49	1.8	0.0	0.0	1.0	2.0	6.0
Jul	dec-20	27.3	11.7	19.5	43	8.0	16.6	2.0	4.9	49	9.0	4.1	19.8	3.0	3.0	15.0
	dec-21	27.0	11.7	19.4	45	7.9	16.5	1.9	4.8	48	43.6	10.8	111.3	35.0	2.0	59.0
	dec-22	26.6	11.7	19.2	48	7.6	16.3	1.8	4.6	46	26.4	7.0	39.0	40.0	2.0	44.0
Aug	dec-23	26.4	11.7	19.1	49	7.5	16.2	1.8	4.5	45	43.9	35.7	61.8	20.0	30.0	72.0
	dec-24	26.2	11.1	18.7	48	7.9	16.5	1.7	4.5	45	26.6	0.0	49.1	2.0	16.0	66.0
	dec-25	26.0	10.4	18.2	46	8.4	17.0	1.7	4.5	45	17.7	22.0	32.4	8.0	10.0	16.0
Sep	dec-26	25.8	10.0	17.9	46	8.6	17.1	1.7	4.5	45	2.1	0.0	3.4	3.0	0.0	4.0
	dec-27	25.2	9.1	17.2	44	9.0	17.3	1.7	4.4	44	0.2	0.0	0.0	0.0	0.0	1.0
	dec-28	24.5	7.9	16.2	42	9.6	17.6	1.6	4.2	42	6.4	0.0	0.0	0.0	2.0	30.0
Oct	dec-29	24.1	7.3	15.7	41	9.9	17.4	1.6	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	23.6	6.2	14.9	41	9.9	17.0	1.6	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	23.0	4.8	13.9	41	9.9	16.4	1.5	3.6	36	1.4	0.0	0.0	0.0	0.0	7.0
Nov	dec-32	22.7	4.1	13.4	41	9.9	16.0	1.4	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	22.6	3.7	13.1	42	9.7	15.5	1.4	3.3	33	4.8	0.0	0.0	0.0	0.0	24.0
	dec-34	22.4	3.1	12.8	43	9.5	15.0	1.4	3.2	32	0.8	0.0	0.0	0.0	4.0	0.0
Dec	dec-35	22.4	2.8	12.6	43	9.4	14.8	1.4	3.1	31	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	22.4	2.9	12.6	46	9.4	14.8	1.4	3.1	31	3.4	17.0	0.0	0.0	0.0	0.0
Year		24.8	8.1	16.4	44	9.0	6039	1.7	4.2	1507	360	352	414	301	249	482
										P/PET	0.2	0.2	0.3	0.2	0.2	0.3

station: Risaba (agro-)climatological
latitude: 14°43' average 1981-1990
longitude: 44°18'
altitude: 2300 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)										
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	dec-1	23.6	0.7	12.2	49	9.5	15.0	1.6	3.2	32	1.7	0.0	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Jan	dec-2	23.6	1.0	12.3	52	9.6	15.4	1.6	3.2	32	1.4	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1
	dec-3	23.9	2.0	12.9	49	9.5	15.7	1.7	3.4	34	3.4	0.0	1.2	22.7	0.0	8.5	0.0	0.0	0.0	0.0	1.4
	dec-4	24.2	3.2	13.7	44	9.5	16.1	1.8	3.7	37	4.1	0.0	0.0	1.8	0.0	2.8	2.0	0.0	0.0	7.5	26.5
Feb	dec-5	24.3	3.8	14.1	42	9.4	16.6	1.8	3.9	39	4.2	0.0	9.3	17.9	0.0	0.0	8.0	2.0	3.0	0.0	2.0
	dec-6	24.9	4.8	14.9	42	9.1	16.8	1.8	4.1	41	6.4	0.0	0.0	0.0	0.0	2.5	18.8	18.1	14.4	0.0	10.3
	dec-7	25.8	6.1	15.9	43	8.8	16.8	1.9	4.3	43	8.6	11.0	19.0	0.0	0.0	0.0	25.5	22.8	0.0	0.0	7.8
Mar	dec-8	26.2	6.8	16.5	43	8.6	17.0	1.9	4.4	44	14.2	70.5	4.7	9.4	7.1	7.9	15.4	22.1	0.0	5.0	0.0
	dec-9	26.1	7.2	16.7	44	8.5	17.1	1.8	4.5	45	27.7	109.2	79.4	25.9	0.0	7.9	0.0	2.5	0.0	23.0	29.5
	dec-10	26.0	7.8	16.9	45	8.2	17.0	1.7	4.5	45	33.8	14.2	31.6	63.9	0.0	39.4	27.5	30.9	2.6	116.0	11.7
Apr	dec-11	25.9	8.2	17.0	46	8.1	17.0	1.7	4.5	45	16.1	49.8	7.7	13.7	3.5	9.9	33.2	14.9	28.6	0.0	0.0
	dec-12	26.5	8.4	17.4	41	8.2	17.2	1.7	4.6	46	19.5	0.0	13.5	58.9	0.0	61.0	14.9	0.0	17.4	21.0	8.0
	dec-13	27.3	8.6	18.0	35	8.4	17.3	1.8	4.9	49	12.0	1.7	23.7	2.3	44.9	22.1	14.2	1.4	0.0	0.0	9.9
May	dec-14	27.7	8.8	18.3	32	8.4	17.3	1.9	5.0	50	13.7	14.1	37.0	6.5	43.2	15.4	0.2	1.7	0.1	19.0	0.0
	dec-15	28.4	8.8	18.6	30	8.5	17.2	1.9	5.0	50	4.6	0.0	0.0	38.7	6.2	0.0	0.0	0.6	0.0	0.0	0.0
	dec-16	29.3	8.7	19.0	28	8.6	17.2	1.9	5.1	51	3.0	8.0	0.0	0.0	0.0	0.0	0.0	1.1	12.0	7.0	1.4
Jun	dec-17	29.8	8.7	19.3	27	8.6	17.2	1.9	5.2	52	1.2	0.0	2.1	0.0	5.3	1.0	0.0	0.5	0.7	2.0	0.0
	dec-18	29.6	9.2	19.4	35	8.0	16.5	2.0	5.0	50	0.8	0.0	0.0	1.2	6.2	0.0	0.0	0.0	0.0	1.0	0.0
	dec-19	29.3	9.8	19.5	45	7.2	15.6	2.0	4.8	48	6.2	17.0	0.0	22.0	3.8	4.7	0.0	0.0	5.5	2.0	7.0
Jul	dec-20	29.1	10.1	19.6	50	6.8	15.2	2.0	4.6	46	10.2	0.0	0.6	0.0	1.4	22.8	0.0	0.0	37.0	10.0	30.1
	dec-21	28.8	10.3	19.5	54	6.7	15.2	2.0	4.5	45	23.1	13.3	29.8	0.0	0.4	2.4	41.4	41.5	64.8	9.0	27.9
	dec-22	28.3	10.5	19.4	59	6.6	15.1	2.0	4.4	44	23.8	35.3	27.2	0.0	0.5	29.0	29.2	37.8	20.8	50.0	8.1
Aug	dec-23	28.1	10.6	19.3	62	6.6	15.0	2.0	4.3	43	20.1	25.4	10.1	27.4	8.6	28.7	6.9	18.4	25.0	29.0	21.0
	dec-24	28.0	9.5	18.7	60	7.2	15.7	1.9	4.3	43	22.9	22.6	13.3	52.3	0.1	19.8	30.5	10.2	48.8	26.0	4.9
	dec-25	27.9	8.1	18.0	57	7.9	16.5	1.9	4.4	44	6.8	0.0	0.4	0.0	0.0	1.4	0.0	30.6	22.8	0.0	12.5
Sep	dec-26	27.8	7.4	17.6	56	8.3	16.7	1.9	4.4	44	0.5	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.5	0.0	0.0
	dec-27	27.0	6.1	16.5	50	8.9	17.1	1.8	4.3	43	0.2	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-28	26.0	4.2	15.1	42	9.6	17.5	1.7	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	25.4	3.3	14.4	38	10.0	17.5	1.7	4.1	41	3.7	0.0	27.9	4.6	0.0	0.0	0.0	0.0	0.0	4.0	0.0
	dec-30	25.1	2.6	13.8	39	10.0	17.0	1.6	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	24.7	1.5	13.1	41	10.0	16.5	1.6	3.6	36	2.2	0.0	4.3	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	24.5	1.0	12.7	42	10.0	16.0	1.5	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	24.1	0.7	12.4	43	9.8	15.5	1.5	3.3	33	0.6	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	23.7	0.3	12.0	44	9.5	14.9	1.5	3.1	31	1.7	0.0	0.3	0.0	0.6	0.0	9.7	0.0	0.0	6.0	0.0
Dec	dec-35	23.5	0.1	11.8	44	9.4	14.7	1.5	3.1	31	3.5	0.0	12.9	0.0	5.8	0.0	0.0	0.0	0.0	16.0	0.0
	dec-36	23.5	0.4	12.0	47	9.5	14.8	1.5	3.1	31	0.6	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0
Year		26.3	5.8	16.1	44	8.7	5869	1.8	4.2	1503	302	392	384	369	138	309	277	263	304	354	230
										P/PET	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2

station: Al Janat
latitude: 15°41'
longitude: 43°56'
altitude: 2200 m

rainfall
average 1975-1977, 1979-1980

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1976	1977	1979	1980
	dec-1	24.6	2.0	13.3	42	10.3	15.6	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	24.0	2.0	13.0	43	10.7	16.3	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	24.5	3.0	13.7	43	10.2	16.3	1.8	3.6	36	4.0	0.0	0.0	20.2	0.0	0.0
	dec-4	25.1	4.3	14.7	43	9.7	16.2	1.9	3.9	39	0.4	0.0	0.0	0.0	0.0	2.0
Feb	dec-5	25.4	5.0	15.2	43	9.4	16.5	2.0	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
	dec-6	25.9	6.3	16.1	44	9.2	16.8	2.0	4.3	43	0.2	0.0	0.0	0.0	0.0	1.0
	dec-7	26.5	7.9	17.2	45	9.0	16.9	2.1	4.5	45	6.3	0.0	31.4	0.0	0.0	0.0
Mar	dec-8	26.8	8.8	17.8	46	8.8	17.1	2.2	4.7	47	4.1	0.0	0.0	0.0	0.0	20.6
	dec-9	26.6	9.1	17.9	48	8.7	17.3	2.1	4.7	47	14.4	0.0	46.1	0.0	5.8	20.1
	dec-10	26.4	9.5	18.0	50	8.6	17.4	2.1	4.7	47	14.3	44.3	2.0	17.5	7.5	0.0
Apr	dec-11	26.3	9.8	18.0	51	8.5	17.4	2.0	4.7	47	9.5	0.0	0.0	0.0	25.2	22.4
	dec-12	27.0	10.0	18.5	45	9.1	18.2	2.1	5.1	51	2.5	0.0	11.5	0.0	1.0	0.0
	dec-13	27.8	10.4	19.1	36	10.0	19.2	2.3	5.5	55	18.6	0.0	41.1	27.0	24.0	1.0
May	dec-14	28.3	10.5	19.4	32	10.4	19.6	2.4	5.8	58	1.8	0.0	0.0	5.9	0.0	3.2
	dec-15	28.9	11.1	20.0	31	10.4	19.4	2.5	5.9	59	11.8	0.0	32.8	26.4	0.0	0.0
	dec-16	29.7	11.7	20.7	29	10.3	19.3	2.6	6.1	61	0.0	0	0.0	0.0	0.0	0.0
Jun	dec-17	30.1	12.1	21.1	28	10.3	19.2	2.6	6.2	62	3.8	0	0.0	19.0	0.2	0.0
	dec-18	30.1	12.6	21.3	32	9.5	18.3	2.5	6.0	60	0.0	0	0.0	0.0	0.0	0.0
	dec-19	30.1	13.3	21.7	37	8.4	17.1	2.4	5.6	56	8.1	5.0	0.0	0.0	22.2	13.5
Jul	dec-20	30.1	13.7	21.9	39	7.9	16.5	2.3	5.4	54	2.4	5.0	0.0	0.0	2.0	5.0
	dec-21	29.9	13.6	21.7	42	8.0	16.7	2.3	5.4	54	11.6	30.8	0.0	0.0	3.0	24.2
	dec-22	29.6	13.4	21.5	45	8.1	16.8	2.3	5.3	53	36.1	56.1	39.0	52.0	19.0	14.5
Aug	dec-23	29.5	13.3	21.4	47	8.1	16.9	2.3	5.3	53	24.7	36.5	12.3	0.0	45.5	29.0
	dec-24	29.7	12.9	21.3	43	8.6	17.4	2.1	5.3	53	27.9	51.0	0.0	0.0	76.0	12.5
	dec-25	29.9	12.4	21.1	38	9.2	17.9	1.8	5.2	52	15.4	0.0	8.0	47.9	20.2	1.0
Sep	dec-26	30.1	12.1	21.1	35	9.6	18.1	1.7	5.1	51	1.1	5.3	0.0	0.0	0.0	0.0
	dec-27	28.5	9.6	19.1	33	10.2	18.5	1.7	4.9	49	0.0	0.0	0.0	0.0	0.0	0.0
	dec-28	26.4	6.4	16.4	31	11.0	18.9	1.8	4.6	46	0.0	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	25.4	4.8	15.1	31	11.4	18.9	1.8	4.4	44	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	25.0	3.8	14.4	32	11.2	18.1	1.7	4.1	41	20.4	0.0	0.0	89.0	0.0	13.0
	dec-31	24.4	2.4	13.4	33	10.9	17.3	1.6	3.8	38	4.8	0.0	24.0	0.0	0.0	0.0
Nov	dec-32	24.1	1.7	12.9	34	10.8	16.7	1.6	3.5	35	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	24.7	1.8	13.3	36	10.4	15.9	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	25.6	2.0	13.8	39	9.8	15.0	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	26.0	2.1	14.0	41	9.5	14.6	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	25.3	2.0	13.7	42	9.9	15.0	1.7	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0
Year		27.2	8.0	17.6	39	9.6	6232	2.0	4.7	1681	244	234	248	305	252	183
										P/PET	0.1	0.1	0.1	0.2	0.1	0.1

station: Rayda
latitude: 15°49'
longitude: 44°03'
altitude: 2250 m

rainfall
average 1975, 1977, 1979-1980

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)				
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1977	1979	1980
	dec-1	24.6	1.8	13.2	42	10.3	15.6	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	23.9	1.7	12.8	43	10.7	16.2	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0
	dec-3	24.4	2.7	13.6	43	10.2	16.2	1.8	3.6	36	5.2	0.0	20.8	0.0	0.0
	dec-4	25.1	4.1	14.6	43	9.7	16.2	1.9	3.9	39	1.7	0.0	0.0	0.0	6.6
Feb	dec-5	25.4	4.8	15.1	43	9.4	16.4	2.0	4.1	41	0.0	0.0	0.0	0.0	0.0
	dec-6	25.8	6.1	15.9	44	9.2	16.7	2.0	4.3	43	0.6	0.0	0.0	0.0	2.2
	dec-7	26.4	7.8	17.1	45	9.0	16.9	2.1	4.5	45	0.0	0.0	0.0	0.0	0.0
Mar	dec-8	26.7	8.6	17.7	46	8.8	17.1	2.2	4.7	47	2.8	0.0	0.0	0.0	11.1
	dec-9	26.6	8.9	17.8	48	8.7	17.3	2.1	4.7	47	7.2	7.8	0.0	0.0	20.9
	dec-10	26.3	9.4	17.9	50	8.6	17.4	2.1	4.7	47	14.2	56.8	0.0	0.0	0.0
Apr	dec-11	26.2	9.6	17.9	51	8.5	17.4	2.0	4.7	47	21.5	22.6	58.5	5.0	0.0
	dec-12	26.9	9.9	18.4	45	9.1	18.2	2.1	5.0	50	8.3	33.1	0.0	0.0	0.0
	dec-13	27.8	10.2	19.0	36	10.0	19.2	2.3	5.5	55	16.7	0.0	23.2	43.5	0.0
May	dec-14	28.2	10.4	19.3	32	10.4	19.6	2.4	5.7	57	0.0	0.0	0.0	0.0	0.0
	dec-15	28.8	10.9	19.8	31	10.4	19.5	2.5	5.9	59	9.4	0.0	37.7	0.0	0.0
	dec-16	29.6	11.6	20.6	29	10.3	19.3	2.6	6.1	61	0.0	0.0	0.0	0.0	0.0
Jun	dec-17	30.0	11.9	20.9	28	10.3	19.2	2.6	6.2	62	5.4	20.8	0.2	0.7	0.0
	dec-18	30.0	12.4	21.2	32	9.5	18.3	2.5	5.9	59	0.0	0.0	0.0	0.0	0.0
	dec-19	30.0	13.1	21.6	37	8.4	17.1	2.4	5.6	56	9.7	13.2	0.0	22.0	3.5
Jul	dec-20	30.1	13.5	21.8	39	7.9	16.6	2.3	5.4	54	6.6	7.3	5.8	0.0	13.2
	dec-21	29.8	13.4	21.6	42	8.0	16.7	2.3	5.4	54	28.1	32.9	13.0	26.6	39.8
	dec-22	29.6	13.2	21.4	45	8.1	16.8	2.3	5.3	53	21.0	83.8	0.0	0.0	0.0
Aug	dec-23	29.4	13.1	21.3	47	8.1	16.9	2.3	5.2	52	30.1	34.6	0.0	35.2	50.7
	dec-24	29.6	12.7	21.2	43	8.6	17.3	2.1	5.2	52	59.1	72.2	0.0	158.0	6.0
	dec-25	29.9	12.2	21.0	38	9.2	17.9	1.8	5.2	52	13.8	0.0	42.7	12.6	0.0
Sep	dec-26	30.0	11.9	20.9	35	9.6	18.1	1.7	5.1	51	1.2	3.7	0.0	1.2	0.0
	dec-27	28.4	9.4	18.9	33	10.2	18.4	1.7	4.9	49	0.0	0.0	0.0	0.0	0.0
	dec-28	26.4	6.2	16.3	31	11.0	18.9	1.8	4.6	46	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	25.3	4.5	14.9	31	11.4	18.9	1.8	4.4	44	0.0	0.0	0.0	0.0	0.0
	dec-30	24.9	3.5	14.2	32	11.2	18.1	1.7	4.1	41	0.0	0.0	0.0	0.0	0.0
	dec-31	24.3	2.2	13.2	33	10.9	17.3	1.6	3.7	37	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	24.0	1.5	12.8	34	10.8	16.7	1.6	3.5	35	0.0	0.0	0.0	0.0	0.0
	dec-33	24.7	1.6	13.1	36	10.4	15.8	1.6	3.4	34	2.8	0.0	0.0	0.0	11.0
	dec-34	25.5	1.8	13.6	39	9.8	15.0	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	26.0	1.8	13.9	41	9.5	14.6	1.7	3.3	33	0.0	0.0	0.0	0.0	0.0
	dec-36	25.3	1.8	13.5	42	9.9	15.0	1.7	3.3	33	0.0	0.0	0.0	0.0	0.0
Year		27.1	7.8	17.4	39	9.6	6229	2.0	4.7	1675	265	389	202	305	165
										P/PET	0.2	0.2	0.1	0.2	0.1

station: Mengida rainfall
latitude: 15°40' average 1975-1976, 1978-1979
longitude: 44°01'
altitude: 2200 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)				
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1975	1976	1978	1979
	dec-1	24.7	2.4	13.5	42	10.3	15.6	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	24.0	2.3	13.2	43	10.7	16.3	1.7	3.5	35	2.0	0.0	0.0	0.0	8.1
	dec-3	24.5	3.3	13.9	43	10.2	16.3	1.8	3.7	37	0.8	0.0	0.0	0.0	3.0
	dec-4	25.1	4.6	14.9	43	9.7	16.2	1.9	3.9	39	0.0	0.0	0.0	0.0	0.0
Feb	dec-5	25.5	5.3	15.4	43	9.4	16.5	2.0	4.1	41	0.0	0.0	0.0	0.0	0.0
	dec-6	25.9	6.5	16.2	44	9.2	16.8	2.0	4.3	43	0.0	0.0	0.0	0.0	0.0
	dec-7	26.5	8.2	17.4	45	9.0	16.9	2.1	4.5	45	9.0	0.0	36.1	0.0	0.0
Mar	dec-8	26.9	9.0	17.9	46	8.8	17.1	2.2	4.7	47	0.2	0.0	0.2	0.0	0.6
	dec-9	26.7	9.4	18.0	48	8.7	17.3	2.1	4.7	47	14.9	55.0	2.8	0.0	1.6
	dec-10	26.5	9.8	18.2	50	8.6	17.4	2.1	4.7	47	15.1	0.0	32.8	5.0	22.5
Apr	dec-11	26.4	10.0	18.2	51	8.5	17.4	2.0	4.7	47	3.3	0.0	0.0	13.0	0.0
	dec-12	27.1	10.3	18.7	45	9.1	18.2	2.1	5.1	51	18.5	63.0	11.1	0.0	0.0
	dec-13	28.0	10.6	19.3	36	10.0	19.2	2.3	5.6	56	45.0	0.0	74.6	6.1	99.4
May	dec-14	28.4	10.8	19.6	32	10.4	19.6	2.4	5.8	58	6.7	0.0	26.7	0.0	0.0
	dec-15	29.0	11.3	20.2	31	10.4	19.4	2.5	5.9	59	0.0	0.0	0.0	0.0	0.0
	dec-16	29.8	12.0	20.9	29	10.3	19.3	2.6	6.1	61	0.0	0.0	0.0	0.0	0.0
Jun	dec-17	30.2	12.4	21.3	28	10.3	19.2	2.6	6.2	62	0.2	0.0	0.0	0.0	0.8
	dec-18	30.2	12.9	21.5	32	9.5	18.3	2.5	6.0	60	1.6	0.0	0.0	1.9	4.5
	dec-19	30.2	13.6	21.9	37	8.4	17.1	2.4	5.6	56	1.2	0.0	0.0	4.0	0.7
Jul	dec-20	30.2	13.9	22.1	39	7.9	16.5	2.3	5.5	55	23.2	43.2	0.0	47.9	1.5
	dec-21	30.0	13.8	21.9	42	8.0	16.7	2.3	5.4	54	23.3	29.3	0.0	49.2	14.5
	dec-22	29.8	13.7	21.7	45	8.1	16.8	2.3	5.3	53	32.9	59.2	46.0	24.4	2.1
Aug	dec-23	29.6	13.6	21.6	47	8.1	16.9	2.3	5.3	53	39.7	60.2	33.2	39.7	25.6
	dec-24	29.8	13.2	21.5	43	8.6	17.4	2.1	5.3	53	18.5	41.0	6.3	0.0	26.8
	dec-25	30.0	12.6	21.3	38	9.2	17.9	1.8	5.2	52	1.4	0.0	0.0	0.0	5.7
Sep	dec-26	30.2	12.4	21.3	35	9.6	18.1	1.7	5.1	51	0.0	0.0	0.0	0.0	0.0
	dec-27	28.6	10.0	19.3	33	10.2	18.5	1.7	4.9	49	0.0	0.0	0.0	0.0	0.0
	dec-28	26.6	6.8	16.7	31	11.0	18.9	1.8	4.7	47	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	25.6	5.2	15.4	31	11.4	18.9	1.8	4.5	45	0.0	0.0	0.0	0.0	0.0
	dec-30	25.1	4.1	14.6	32	11.2	18.1	1.7	4.1	41	0.0	0.0	0.0	0.0	0.0
	dec-31	24.5	2.8	13.6	33	10.9	17.3	1.6	3.8	38	2.5	0.0	10.0	0.0	0.0
Nov	dec-32	24.2	2.1	13.2	34	10.8	16.7	1.6	3.5	35	3.1	0.0	0.0	12.5	0.0
	dec-33	24.8	2.2	13.5	36	10.4	15.9	1.6	3.5	35	0.0	0.0	0.0	0.0	0.0
	dec-34	25.6	2.4	14.0	39	9.8	15.0	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	26.0	2.4	14.2	41	9.5	14.6	1.7	3.4	34	5.2	0.0	0.0	20.6	0.0
	dec-36	25.4	2.4	13.9	42	9.9	15.0	1.7	3.4	34	0.0	0.0	0.0	0.0	0.0
Year		27.3	8.3	17.8	39	9.6	6232	2.0	4.7	1688	268	351	280	224	217
										P/PET	0.2	0.2	0.2	0.1	0.1

station: Rada (agro-)meteorological
latitude: 14°23' average 1983-1988, 1990
longitude: 44°50'
altitude: 2100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)							
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1983	1984	1985	1986	1987	1988	1990
	dec-1	23.3	3.6	13.4	58	9.5	15.1	1.2	3.0	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	23.3	3.3	13.3	57	9.5	15.4	1.2	3.1	31	0.3	0.0	0.0	0.0	0.0	0.0	1.4	0.4
	dec-3	23.8	4.3	14.0	55	9.2	15.5	1.3	3.3	33	9.4	32.6	30.0	0.2	0.0	0.0	0.0	3.0
	dec-4	24.4	5.5	14.9	52	8.7	15.5	1.4	3.5	35	2.9	13.6	0.0	0.0	0.0	0.0	0.0	7.0
Feb	dec-5	24.7	6.1	15.4	51	8.5	15.7	1.5	3.7	37	2.6	14.8	0.0	0.0	1.2	0.0	0.0	2.4
	dec-6	25.1	7.0	16.1	52	8.6	16.2	1.5	3.9	39	5.3	2.7	0.0	0.0	5.3	14.3	0.0	14.8
	dec-7	25.6	8.3	17.0	53	8.7	16.7	1.6	4.1	41	4.9	7.0	0.0	0.0	6.5	20.4	0.4	0.2
Mar	dec-8	25.8	9.0	17.4	54	8.7	17.1	1.6	4.2	42	6.7	7.5	0.0	0.0	7.3	32.0	0.0	0.0
	dec-9	25.7	9.8	17.8	55	8.5	17.2	1.5	4.3	43	21.7	16.5	0.0	84.3	0.0	50.5	0.0	0.4
	dec-10	25.6	10.9	18.2	56	8.2	17.0	1.5	4.3	43	13.3	31.7	1.2	0.0	7.1	31.5	0.0	21.6
Apr	dec-11	25.5	11.5	18.5	56	8.1	17.0	1.5	4.3	43	27.2	83.5	0.0	0.0	53.8	19.5	33.6	0.0
	dec-12	26.1	11.8	18.9	55	8.5	17.5	1.6	4.5	45	23.9	77.0	0.0	0.0	30.6	0.0	59.4	0.0
	dec-13	26.9	12.1	19.5	53	9.1	18.1	1.6	4.7	47	0.9	0.0	6.2	0.0	0.0	0.0	0.0	0.0
May	dec-14	27.3	12.3	19.8	52	9.4	18.4	1.7	4.8	48	0.8	0.0	1.1	0.0	0.0	0.0	2.2	2.0
	dec-15	27.9	12.8	20.3	50	9.3	18.2	1.8	4.9	49	8.3	28.7	28.7	0.0	0.0	0.9	0.0	0.0
	dec-16	28.8	13.4	21.1	47	9.2	17.9	1.9	5.1	51	0.6	0.0	0.0	0.0	0.0	4.4	0.0	0.0
Jun	dec-17	29.2	13.6	21.4	45	9.1	17.8	1.9	5.2	52	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	29.4	14.2	21.8	46	8.6	17.2	2.0	5.2	52	0.7	0.0	0.3	0.0	0.0	0.0	0.0	4.6
	dec-19	29.7	14.9	22.3	46	7.9	16.4	2.1	5.2	52	0.2	0.0	0.0	0.0	0.0	0.0	0.6	1.0
Jul	dec-20	29.8	15.3	22.5	46	7.6	16.1	2.2	5.2	52	3.3	0.0	0.0	12.1	0.0	0.5	4.4	6.4
	dec-21	29.5	15.1	22.3	50	7.5	16.0	2.1	5.1	51	12.6	0.0	1.0	0.5	18.3	0.2	59.5	8.6
	dec-22	29.2	14.8	22.0	54	7.3	15.8	2.1	4.8	48	15.5	0.0	6.0	7.2	31.8	29.0	13.2	21.2
Aug	dec-23	29.0	14.7	21.8	56	7.2	15.8	2.0	4.7	47	12.4	29.0	7.7	17.0	2.0	22.8	7.7	0.4
	dec-24	28.5	13.6	21.0	55	7.8	16.4	1.9	4.7	47	10.9	12.4	0.0	2.1	29.0	5.9	25.4	1.4
	dec-25	27.8	12.1	19.9	54	8.5	17.2	1.8	4.7	47	4.8	0.0	0.0	0.0	0.0	7.4	18.5	8.0
Sep	dec-26	27.4	11.4	19.4	53	8.9	17.4	1.7	4.6	46	2.3	0.0	0.0	0.0	16.0	0.0	0.0	0.0
	dec-27	26.6	9.6	18.1	51	9.4	17.7	1.6	4.4	44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-28	25.5	7.2	16.3	49	10.1	18.1	1.4	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	24.9	6.0	15.4	49	10.4	18.0	1.4	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	24.4	5.3	14.8	50	10.4	17.5	1.3	3.7	37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	23.7	4.4	14.0	53	10.3	16.9	1.2	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	23.3	4.0	13.6	54	10.3	16.4	1.1	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	23.3	4.0	13.6	57	10.0	15.8	1.1	3.1	31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	23.3	4.0	13.6	60	9.5	15.1	1.1	3.0	30	1.4	0.0	0.0	0.0	3.0	0.0	6.5	0.0
Dec	dec-35	23.2	4.0	13.6	61	9.3	14.8	1.1	2.9	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	23.3	3.8	13.5	60	9.4	14.9	1.2	2.9	29	0.9	0.0	0.0	0.0	0.0	6.0	0.0	0.0
Year		26.1	9.3	17.7	53	8.9	5995	1.6	4.2	1497	194	357	82	123	212	245	233	103
										P/PET	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1

station: Sana'a (agro-)meteorological
latitude: 15°13' average 1983-1990
longitude: 44°11'
altitude: 2200 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)								
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1983	1984	1985	1986	1987	1988	1989	1990
	dec-1	24.4	3.7	14.1	46	10.3	15.7	1.3	3.2	32	0.0					0.0	0.0		
Jan	dec-2	24.3	4.1	14.2	48	10.3	16.0	1.3	3.3	33	0.0					0.0	0.0		
	dec-3	24.9	5.1	15.0	48	10.1	16.2	1.3	3.5	35	0.0	27.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	25.7	6.5	16.1	48	9.7	16.4	1.4	3.7	37	0.0					0.0	0.0		
Feb	dec-5	26.1	7.2	16.7	48	9.6	16.7	1.5	3.9	39	0.0					0.0	0.0		
	dec-6	26.6	8.3	17.5	47	9.3	16.9	1.6	4.2	42	19.9	6.3	0.0	0.0	1.5	2.3	37.4	0.3	12.9
	dec-7	27.3	9.8	18.6	47	9.0	17.0	1.8	4.5	45	2.9					5.8	0.0		
Mar	dec-8	27.7	10.6	19.2	47	8.9	17.2	1.9	4.7	47	0.3					0.4	0.2		
	dec-9	27.5	10.7	19.1	49	8.8	17.4	1.9	4.7	47	0.6	39.0	2.0	0.9	45.8	0.0	1.2	1.1	1.6
	dec-10	27.3	10.7	19.0	51	8.7	17.6	1.9	4.7	47	7.3					14.6	0.0		
Apr	dec-11	27.2	10.8	19.0	52	8.7	17.7	1.9	4.7	47	26.3					0.6	51.9		
	dec-12	27.9	11.2	19.6	45	9.1	18.2	2.0	5.1	51	7.8	33.0	10.2	112.0	60.8	0.0	15.5	74.1	21.1
	dec-13	28.8	11.8	20.3	36	9.6	18.8	2.2	5.6	56	4.3					8.5	0.0		
May	dec-14	29.3	12.1	20.7	32	9.9	19.0	2.3	5.8	58	0.0					0.0	0.0		
	dec-15	30.0	12.7	21.3	31	10.0	19.0	2.4	6.0	60	5.5	4.6	39.8	49.4	4.0	10.9	0.0	3.5	0.0
	dec-16	30.9	13.5	22.2	30	10.1	19.0	2.5	6.2	62	0.2					0.4	0.0		
Jun	dec-17	31.3	13.9	22.6	29	10.1	19.0	2.6	6.3	63	9.3					18.5	0.0		
	dec-18	31.3	14.1	22.7	33	9.4	18.1	2.5	6.1	61	0.0	0.0	13.0	0.0	23.6	0.0	0.0	9.3	0.0
	dec-19	31.3	14.4	22.9	39	8.4	17.0	2.5	5.8	58	0.0					0.0	0.0		
Jul	dec-20	31.3	14.6	22.9	42	7.9	16.4	2.4	5.6	56	3.4					0.0	6.8		
	dec-21	31.1	14.8	22.9	44	7.8	16.4	2.7	5.7	57	28.4	8.0	0.0	10.2	8.1	0.0	56.8	6.8	7.5
	dec-22	30.9	15.0	22.9	47	7.7	16.3	3.0	5.8	58	5.0					6.7	3.3		
Aug	dec-23	30.8	15.1	23.0	49	7.7	16.3	3.2	5.8	58	9.8					13.6	5.9		
	dec-24	30.2	14.4	22.3	45	8.1	16.8	2.6	5.6	56	1.1	24.9	0.0	8.9	63.5	1.0	1.2	16.2	4.3
	dec-25	29.4	13.4	21.4	40	8.8	17.4	1.9	5.1	51	11.4					20.8	2.0		
Sep	dec-26	29.0	13.0	21.0	38	9.1	17.6	1.5	4.8	48	2.2					0.0	4.4		
	dec-27	28.2	11.3	19.8	37	9.7	17.9	1.6	4.7	47	0.0	0.0	0.0	4.8	2.1	0.0	0.0	0.0	1.4
	dec-28	27.2	9.2	18.2	36	10.4	18.3	1.6	4.6	46	0.0					0.0	0.0		
Oct	dec-29	26.7	8.1	17.4	36	10.8	18.3	1.7	4.4	44	0.0					0.0	0.0		
	dec-30	25.8	6.6	16.2	37	10.7	17.7	1.5	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	24.6	4.6	14.6	39	10.6	17.0	1.4	3.6	36	0.0					0.0	0.0		
Nov	dec-32	24.0	3.7	13.8	40	10.5	16.5	1.3	3.4	34	0.0					0.0	0.0		
	dec-33	24.2	3.5	13.8	40	10.4	16.0	1.3	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	24.4	3.2	13.8	41	10.3	15.6	1.4	3.3	33	0.0					0.0	0.0		
Dec	dec-35	24.5	3.1	13.8	42	10.2	15.4	1.5	3.3	33	0.0					0.0	0.0		
	dec-36	24.4	3.4	13.9	44	10.2	15.5	1.4	3.2	32	6.9	0.0	17.8	0.0	3.4	13.8	0.0	7.4	0.0
Year		27.7	9.7	18.7	42	9.5	6182	1.9	4.7	1685	152	143	83	186	213	118	187	119	49
										P/PET	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0

station: Al Irra
latitude: 15°31'
longitude: 44°11'
altitude: 2200 m

(agro-)meteorological
average 1986, 1989

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)	
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	1986	1989
	dec-1	25.0	1.6	13.3	38	10.4	15.8	2.0	3.6	36	0.0	0.0
Jan	dec-2	25.0	1.4	13.2	38	11.0	16.7	2.1	3.8	38	2.0	0.0
	dec-3	25.4	2.3	13.9	38	10.5	16.6	2.2	4.0	40	0.0	0.0
	dec-4	25.9	3.6	14.8	38	9.9	16.5	2.4	4.3	43	3.0	0.0
Feb	dec-5	26.2	4.3	15.2	38	9.3	16.4	2.4	4.5	45	0.0	0.0
	dec-6	26.7	5.8	16.3	40	9.1	16.7	2.5	4.6	46	2.0	0.0
	dec-7	27.3	7.9	17.6	44	9.0	17.0	2.5	4.8	48	41.0	0.0
Mar	dec-8	27.7	8.9	18.3	46	8.8	17.2	2.5	5.0	50	0.0	0.0
	dec-9	27.6	9.1	18.3	47	8.6	17.2	2.4	4.9	49	0.0	2.0
	dec-10	27.4	9.3	18.3	49	8.4	17.2	2.2	4.9	49	15.0	58.0
Apr	dec-11	27.4	9.4	18.4	50	8.3	17.2	2.2	4.8	48	11.0	2.0
	dec-12	28.1	9.4	18.8	44	9.1	18.2	2.3	5.2	52	16.0	39.0
	dec-13	29.0	9.5	19.3	37	10.3	19.5	2.4	5.6	56	7.0	0.0
May	dec-14	29.5	9.5	19.5	33	10.9	20.2	2.4	5.9	59	3.0	1.0
	dec-15	29.9	10.0	20.0	31	10.8	19.9	2.5	6.0	60	0.0	0.0
	dec-16	30.5	10.7	20.6	28	10.5	19.5	2.6	6.2	62	0.0	6.0
Jun	dec-17	30.7	11.0	20.9	27	10.4	19.3	2.7	6.3	63	0.0	0.0
	dec-18	30.7	11.8	21.3	30	9.6	18.4	2.5	6.0	60	0.0	0.0
	dec-19	30.6	12.9	21.8	34	9.7	18.6	2.2	5.8	58	6.0	0.0
Jul	dec-20	30.6	13.5	22.0	36	8.0	16.6	2.1	5.4	54	0.0	0.0
	dec-21	30.4	13.2	21.8	40	8.2	16.9	1.9	5.2	52	29.0	5.0
	dec-22	30.2	12.8	21.5	44	8.5	17.3	1.6	5.0	50	77.0	6.0
Aug	dec-23	30.1	12.7	21.4	46	8.6	17.4	1.5	4.9	49	0.0	8.0
	dec-24	29.6	11.5	20.6	42	9.0	17.8	1.6	5.0	50	70.0	3.0
	dec-25	29.0	10.0	19.5	35	9.6	18.3	1.8	5.1	51	0.0	0.0
Sep	dec-26	28.7	9.3	19.0	32	10.0	18.6	1.9	5.1	51	1.0	2.0
	dec-27	27.9	7.3	17.6	30	10.5	18.9	1.9	5.0	50	0.0	0.0
	dec-28	26.7	4.7	15.7	27	11.3	19.4	2.0	4.8	48	0.0	0.0
Oct	dec-29	26.2	3.4	14.8	26	12.0	19.6	2.0	4.7	47	0.0	0.0
	dec-30	26.1	2.4	14.3	27	11.7	18.8	2.0	4.4	44	0.0	0.0
	dec-31	26.1	1.2	13.6	28	11.2	17.6	1.9	4.0	40	0.0	0.0
Nov	dec-32	26.0	0.6	13.3	29	11.1	17.1	1.8	3.9	39	0.0	0.0
	dec-33	25.7	1.0	13.4	32	10.5	16.1	1.8	3.7	37	0.0	0.0
	dec-34	25.2	1.6	13.4	37	9.4	14.7	1.8	3.5	35	0.0	0.0
Dec	dec-35	25.0	1.9	13.5	40	8.8	14.0	1.8	3.4	34	0.0	0.0
	dec-36	25.0	1.7	13.4	39	9.7	14.9	1.9	3.5	35	3.0	0.0
Year		27.8	7.1	17.4	37	9.8	6324	2.1	4.8	1726	286	132
										P/PET	0.2	0.1

station: Sa'ada (agro-)meteorological
latitude: 16°56' average 1987-1991
longitude: 43°46'
altitude: 1800 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1987	1988	1989	1990	1991
	dec-1	23.5	6.2	14.9	47	10.1	15.1	2.0	3.5	35	0.3	0.0	1.2	0.0	0.3	0.0
Jan	dec-2	23.4	6.7	15.0	49	10.1	15.4	2.1	3.6	36	2.0	0.0	0.0	0.0	9.9	0.0
	dec-3	23.8	7.6	15.7	48	9.9	15.6	2.2	3.9	39	0.7	0.0	0.0	3.6	0.0	0.0
	dec-4	24.4	8.7	16.6	47	9.7	16.0	2.4	4.2	42	0.1	0.0	0.0	0.0	0.3	0.0
Feb	dec-5	24.7	9.3	17.0	47	9.6	16.4	2.5	4.4	44	0.0	0.0	0.0	0.0	0.0	0.0
	dec-6	25.5	10.1	17.8	46	9.5	16.8	2.5	4.6	46	1.9	0.0	3.0	1.3	0.8	4.6
	dec-7	26.6	11.2	18.9	44	9.3	17.1	2.4	4.9	49	0.4	2.0	0.0	0.0	0.0	0.0
Mar	dec-8	27.2	11.8	19.5	44	9.3	17.5	2.4	5.1	51	1.7	1.2	0.0	2.5	0.0	4.6
	dec-9	27.5	12.1	19.8	44	9.2	17.7	2.3	5.2	52	6.1	0.0	0.0	17.9	9.4	3.1
	dec-10	27.8	12.6	20.2	45	9.1	17.9	2.2	5.2	52	5.5	11.4	6.7	8.9	0.0	0.6
Apr	dec-11	28.0	12.8	20.4	45	9.0	18.0	2.2	5.2	52	4.8	0.0	17.4	0.0	0.0	6.4
	dec-12	29.0	13.5	21.3	39	9.3	18.4	2.2	5.6	56	10.3	0.0	2.5	7.1	40.9	1.0
	dec-13	30.4	14.4	22.4	32	9.7	18.9	2.3	6.1	61	2.9	4.4	0.0	0.0	0.0	10.2
May	dec-14	31.1	14.9	23.0	29	10.0	19.1	2.4	6.3	63	1.2	0.0	0.0	0.0	6.1	0.0
	dec-15	31.7	15.2	23.5	29	10.0	19.0	2.3	6.3	63	0.5	0.0	0.0	0.0	0.0	2.5
	dec-16	32.5	15.7	24.1	29	10.0	19.0	2.3	6.3	63	0.3	0.0	0.0	1.6	0.0	0.0
Jun	dec-17	32.9	15.9	24.4	30	10.0	18.9	2.3	6.3	63	2.0	0.0	0.0	3.3	2.8	4.0
	dec-18	32.9	16.4	24.6	32	9.1	18.0	2.3	6.2	62	3.8	0.0	1.0	0.8	17.0	0.0
	dec-19	32.8	17.1	25.0	36	8.0	16.7	2.4	6.0	60	0.0	0.0	0.0	0.0	0.0	0.0
Jul	dec-20	32.8	17.5	25.1	38	7.5	16.1	2.4	5.9	59	7.2	0.0	26.7	0.3	2.8	6.1
	dec-21	32.7	17.2	24.9	40	7.4	16.0	2.3	5.7	57	5.6	0.0	13.9	0.0	8.4	5.9
	dec-22	32.5	16.7	24.6	43	7.2	15.8	2.1	5.5	55	8.2	18.1	2.5	0.0	16.9	3.5
Aug	dec-23	32.5	16.5	24.5	44	7.2	15.7	2.1	5.4	54	3.0	2.8	3.5	0.0	0.5	8.4
	dec-24	32.0	15.7	23.8	40	7.8	16.3	2.2	5.6	56	0.7	0.0	2.1	0.0	0.6	0.8
	dec-25	31.3	14.6	23.0	33	8.6	17.1	2.4	5.8	58	0.0	0.0	0.0	0.0	0.0	0.0
Sep	dec-26	31.0	14.1	22.5	30	9.0	17.3	2.5	5.9	59	0.1	0.0	0.0	0.0	0.5	0.0
	dec-27	29.8	12.7	21.2	29	9.4	17.5	2.5	5.7	57	0.2	0.0	0.0	0.0	1.0	0.0
	dec-28	28.2	10.9	19.5	28	10.1	17.8	2.4	5.4	54	0.1	0.0	0.0	0.3	0.0	0.0
Oct	dec-29	27.4	10.0	18.7	28	10.4	17.6	2.4	5.2	52	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	26.5	8.6	17.5	29	10.5	17.1	2.2	4.7	47	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	25.3	6.7	16.0	31	10.5	16.6	1.9	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	24.7	5.8	15.3	32	10.6	16.2	1.8	3.8	38	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	24.5	5.6	15.0	35	10.4	15.6	1.8	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	24.1	5.3	14.7	39	10.3	15.2	1.8	3.5	35	0.1	0.0	0.0	0.0	0.0	0.3
Dec	dec-35	23.9	5.2	14.5	42	10.2	15.0	1.8	3.4	34	1.1	0.0	0.0	5.7	0.0	0.0
	dec-36	23.7	5.7	14.7	44	10.2	15.0	1.9	3.4	34	2.0	9.8	0.0	0.0	0.0	0.0
Year		28.3	11.7	20.0	38	9.4	6096	2.2	5.0	1817	73	50	81	53	118	62
										P/PET	0.0	0.0	0.0	0.0	0.1	0.0

station: Dumeid (agro-)meteorological
latitude: 16°56' average 1984-1988, 1990
longitude: 43°46'
altitude: 1800 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)						
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1984	1985	1986	1987	1988	1990
	dec-1	22.7	4.4	13.5	42	10.0	15.0	1.3	3.1	31	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	22.7	4.6	13.7	43	10.1	15.4	1.3	3.1	31	0.3	0.0	0.0	0.0	0.0	1.0	0.5
	dec-3	23.1	5.6	14.3	43	9.9	15.6	1.3	3.3	33	1.7	0.0	10.2	0.0	0.0	0.0	0.0
	dec-4	23.5	6.9	15.2	43	9.6	15.9	1.4	3.5	35	0.2	0.0	0.0	0.0	0.0	0.0	1.0
Feb	dec-5	23.8	7.6	15.7	44	9.5	16.3	1.5	3.7	37	0.3	0.0	0.0	0.0	0.0	0.0	2.0
	dec-6	24.5	8.6	16.5	44	9.3	16.6	1.5	4.0	40	0.3	0.0	0.0	0.0	0.0	1.0	0.5
	dec-7	25.5	9.9	17.7	44	9.0	16.7	1.6	4.2	42	5.1	1.4	0.0	24.4	4.5	0.0	0.0
Mar	dec-8	26.0	10.6	18.3	44	8.8	17.0	1.7	4.4	44	0.2	0.0	0.0	0.0	1.0	0.0	0.0
	dec-9	26.0	11.0	18.5	46	8.8	17.3	1.6	4.5	45	1.8	0.4	1.2	0.0	3.0	0.0	6.0
	dec-10	26.1	11.5	18.8	48	8.8	17.6	1.5	4.5	45	8.6	1.1	2.5	27.3	12.5	0.5	7.5
Apr	dec-11	26.1	11.8	19.0	49	8.8	17.8	1.5	4.6	46	8.6	2.0	14.4	5.0	3.0	9.5	17.5
	dec-12	27.0	12.4	19.7	46	8.9	18.0	1.5	4.7	47	19.2	9.3	20.9	0.7	0.0	20.5	63.5
	dec-13	28.2	13.3	20.8	41	9.1	18.1	1.5	5.0	50	19.1	19.3	27.9	0.0	19.5	0.0	48.0
May	dec-14	28.8	13.7	21.3	38	9.1	18.2	1.5	5.1	51	4.7	6.3	14.8	4.4	0.0	0.0	2.5
	dec-15	29.6	14.4	22.0	35	9.5	18.5	1.6	5.3	53	1.7	7.0	2.2	0.0	1.0	0.0	0.0
	dec-16	30.7	15.2	22.9	31	9.9	18.9	1.7	5.6	56	0.4	1.4	0.0	0.5	0.0	0.5	0.0
Jun	dec-17	31.2	15.6	23.4	29	10.1	19.1	1.8	5.8	58	4.3	0.3	0.0	20.4	0.0	0.0	5.0
	dec-18	31.2	16.1	23.6	31	9.3	18.2	1.8	5.7	57	0.1	0.0	0.0	0.6	0.0	0.0	0.0
	dec-19	31.2	16.7	23.9	34	8.3	17.0	1.8	5.5	55	1.6	0.0	4.0	2.3	2.0	0.0	1.0
Jul	dec-20	31.2	17.0	24.1	36	7.8	16.4	1.8	5.4	54	9.6	1.3	6.0	0.0	0.0	50.5	0.0
	dec-21	31.2	16.8	24.0	37	7.7	16.3	1.8	5.3	53	9.9	0.0	0.0	34.0	0.0	24.0	1.5
	dec-22	31.1	16.7	23.9	38	7.5	16.2	1.8	5.3	53	7.7	3.4	0.0	24.9	1.0	7.0	10.0
Aug	dec-23	31.1	16.6	23.9	39	7.5	16.1	1.8	5.2	52	4.7	0.0	6.5	0.0	11.0	0.0	10.5
	dec-24	30.5	15.5	23.0	35	7.9	16.5	1.8	5.2	52	1.5	1.9	0.0	0.0	1.5	5.5	0.0
	dec-25	29.6	14.1	21.8	30	8.6	17.1	1.9	5.3	53	4.0	0.0	0.0	9.7	3.0	11.0	0.0
Sep	dec-26	29.1	13.4	21.3	28	8.9	17.2	1.9	5.3	53	0.3	0.0	0.0	0.0	0.0	2.0	0.0
	dec-27	28.1	11.8	19.9	27	9.3	17.4	1.9	5.0	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-28	26.8	9.6	18.2	27	9.9	17.6	1.8	4.7	47	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	26.1	8.6	17.3	27	10.2	17.4	1.8	4.5	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	25.4	7.5	16.5	28	10.2	16.9	1.7	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	24.5	6.2	15.3	30	10.3	16.3	1.5	3.7	37	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	24.0	5.5	14.8	31	10.3	15.8	1.4	3.5	35	3.8	0.0	22.6	0.0	0.0	0.0	0.0
	dec-33	23.6	4.9	14.3	34	10.1	15.3	1.4	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	23.0	4.2	13.6	38	10.0	14.9	1.4	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	22.7	3.9	13.3	40	9.9	14.7	1.5	3.1	31	0.6	3.6	0.0	0.0	0.0	0.0	0.0
	dec-36	22.7	4.1	13.4	41	10.0	14.8	1.4	3.0	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		26.9	10.7	18.8	37	9.2	6040	1.6	4.5	1609	120	59	133	154	63	133	177
										P/PET	0.1	0.0	0.1	0.1	0.0	0.1	0.1

station: Gerba
latitude: 14°09'
longitude: 43°26'
altitude: 250 m

(agro-)climatological
average 1970-1977, 1982-1984, 1989-1993

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1974	1975	1976	1977	1982	1983	1984	1989	1990	1991	1992	1993
	dec-1	31.9	18.9	25.4	71	8.6	14.6	1.5	3.9	39	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	31.7	19.3	25.5	72	8.1	14.4	1.5	3.9	39	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
	dec-3	31.7	19.9	25.8	72	7.6	14.3	1.6	4.0	40	11.5	0.0	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0	0.0	0.0	160.0
	dec-4	31.7	20.7	26.2	73	6.9	14.2	1.8	4.1	41	8.1	0.0	0.0	0.0	0.0	0.0	87.2	0.0	0.0	39.0	0.0	0.0	0.0
Feb	dec-5	31.7	21.1	26.4	73	6.6	14.3	1.8	4.3	43	4.6	0.2	2.4	0.0	8.7	15.4	5.5	0.0	0.0	0.0	41.0	0.0	0.0
	dec-6	32.5	21.2	26.8	72	6.8	14.9	1.9	4.5	45	1.4	0.0	0.0	0.0	0.0	0.0	20.1	0.0	0.0	3.0	0.0	0.0	0.0
	dec-7	33.6	21.3	27.4	70	7.1	15.5	1.9	4.8	48	0.7	0.0	0.0	3.3	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar	dec-8	34.1	21.3	27.7	69	7.2	16.0	1.9	5.0	50	1.4	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0
	dec-9	35.1	21.8	28.4	68	7.5	16.6	1.9	5.3	53	3.9	0.4	0.0	4.8	0.0	43.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-10	36.4	22.4	29.4	67	7.9	17.3	1.9	5.6	56	7.8	1.4	23.6	0.0	0.0	0.0	0.0	0.0	44.6	3.0	0.0	41.0	0.0
Apr	dec-11	37.0	22.7	29.9	66	8.1	17.6	1.9	5.8	58	1.8	0.0	3.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	3.0	0.0	5.5
	dec-12	37.6	23.6	30.6	65	8.7	18.2	1.9	6.1	61	6.9	0.0	3.2	55.7	20.6	0.0	29.2	0.0	2.1	0.0	0.0	0.0	0.0
	dec-13	38.3	24.8	31.6	65	9.5	19.1	2.0	6.4	64	9.5	2.7	0.0	7.4	28.2	5.2	0.0	5.4	0.0	0.0	25.5	0.0	15.0
May	dec-14	38.7	25.4	32.1	64	10.0	19.4	2.1	6.6	66	16.4	0.6	31.6	16.6	0.0	47.9	32.6	46.5	0.0	0.0	0.0	0.0	44.0
	dec-15	39.2	26.0	32.6	64	9.4	18.7	2.0	6.5	65	15.9	14.6	0.4	34.1	16.5	21.2	93.7	3.7	0.0	0.0	31.0	6.0	30.0
	dec-16	39.8	26.7	33.3	63	8.7	17.9	1.9	6.4	64	4.0	0.0	4.6	0.0	19.0	0.0	7.2	0.0	0.0	2.5	0.0	24.0	0.0
Jun	dec-17	40.2	27.1	33.6	63	8.4	17.5	1.9	6.4	64	1.0	9.4	0.0	0.0	4.3	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	dec-18	39.9	27.1	33.5	63	7.7	16.9	2.1	6.3	63	0.6	5.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	39.5	27.2	33.4	62	6.9	16.1	2.2	6.2	62	5.7	36.1	2.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	11.0	34.0
Jul	dec-20	39.4	27.2	33.3	62	6.5	15.7	2.3	6.2	62	5.0	4.8	0.2	0.0	0.0	2.3	0.0	0.0	0.0	59.0	5.0	2.0	0.0
	dec-21	39.2	26.9	33.1	62	7.1	16.3	2.3	6.3	63	21.9	27.9	5.0	100.5	3.0	101.8	0.0	0.0	16.0	10.0	0.0	10.0	17.0
	dec-22	39.0	26.5	32.8	62	7.8	17.1	2.2	6.4	64	22.9	57.4	122.4	2.5	23.0	10.2	0.0	12.6	30.7	0.0	0.0	22.5	8.0
Aug	dec-23	38.9	26.4	32.6	62	8.2	17.5	2.1	6.4	64	14.1	14.9	21.8	0.0	57.5	28.0	0.0	15.7	3.0	0.0	0.0	9.0	56.0
	dec-24	38.7	26.1	32.4	63	8.1	17.4	2.0	6.2	62	26.9	38.1	64.8	26.8	17.0	3.4	0.0	0.0	53.0	8.2	0.0	48.0	54.0
	dec-25	38.4	25.8	32.1	64	8.0	17.2	1.8	6.0	60	37.2	162.8	3.0	0.0	4.8	38.0	24.9	52.8	3.0	2.3	22.0	17.5	10.0
Sep	dec-26	38.3	25.7	32.0	65	8.0	16.9	1.8	5.8	58	30.4	48.3	45.6	34.5	26.4	28.5	0.0	36.0	6.5	48.1	0.0	70.7	25.0
	dec-27	37.8	24.7	31.3	66	8.6	17.2	1.6	5.6	56	31.4	84.4	13.8	0.0	34.0	15.8	78.9	5.0	6.5	69.0	18.5	56.0	21.0
	dec-28	37.0	23.5	30.3	67	9.3	17.6	1.3	5.3	53	28.4	20.4	15.2	2.2	0.0	46.0	49.0	0.0	38.0	69.5	0.0	142.0	22.0
Oct	dec-29	36.6	22.9	29.8	67	9.7	17.5	1.2	5.1	51	19.2	22.1	20.5	0.0	43.6	12.5	35.2	0.0	0.0	0.0	0.0	0.0	45.0
	dec-30	35.9	21.9	28.9	68	10.0	17.3	1.2	4.9	49	8.5	0.0	0.0	1.2	103.0	0.0	0.0	0.0	0.0	0.0	2.0	19.0	2.0
	dec-31	35.0	20.5	27.7	68	10.3	17.1	1.3	4.7	47	0.7	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	34.5	19.8	27.1	69	10.5	16.8	1.3	4.5	45	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	33.8	19.2	26.5	69	10.1	16.1	1.3	4.3	43	3.8	0.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	32.8	18.5	25.6	70	9.7	15.5	1.4	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	32.3	18.2	25.2	70	9.5	15.2	1.4	4.0	40	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
	dec-36	32.1	18.6	25.3	70	9.0	14.8	1.4	3.9	39	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		36.1	23.1	29.6	67	8.4	5968	1.8	5.3	1919	355	568	384	296	416	480	486	178	203	315	159	479	561
										P/PET	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.2	0.3

station: Al Dimnah rainfall
latitude: 14°22' average 1978-1982
longitude: 43°27'
altitude: 250 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1978	1979	1980	1981	1982
	dec-1	31.9	18.9	25.4	71	8.6	14.5	1.5	3.9	39	4.4	0.0	0.0	0.0	21.9	0.0
Jan	dec-2	31.7	19.3	25.5	72	8.1	14.4	1.5	3.9	39	6.6	0.0	32.8	0.0	0.0	0.0
	dec-3	31.7	19.9	25.8	72	7.6	14.3	1.6	4.0	40	1.2	0.0	6.0	0.0	0.0	0.0
	dec-4	31.7	20.7	26.2	73	6.9	14.1	1.8	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
Feb	dec-5	31.7	21.1	26.4	73	6.6	14.2	1.8	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0
	dec-6	32.5	21.2	26.8	72	6.8	14.9	1.9	4.5	45	2.6	0.0	13.0	0.0	0.0	0.0
	dec-7	33.6	21.3	27.4	70	7.1	15.5	1.9	4.8	48	0.0	0.0	0.0	0.0	0.0	0.0
Mar	dec-8	34.1	21.3	27.7	69	7.2	16.0	1.9	5.0	50	24.0	0.0	0.0	0.0	0.0	120.0
	dec-9	35.1	21.8	28.4	68	7.5	16.6	1.9	5.3	53	6.4	0.0	0.0	0.0	0.0	32.0
	dec-10	36.4	22.4	29.4	67	7.9	17.3	1.9	5.6	56	0.0	0.0	0.0	0.0	0.0	0.0
Apr	dec-11	37.0	22.7	29.9	66	8.1	17.6	1.9	5.8	58	15.4	37.0	0.0	40.0	0.0	0.0
	dec-12	37.6	23.6	30.6	65	8.7	18.2	1.9	6.1	61	19.1	51.5	30.0	14.0	0.0	0.0
	dec-13	38.3	24.8	31.6	65	9.5	19.1	2.0	6.4	64	17.4	7.0	0.0	0.0	36.0	44.0
May	dec-14	38.7	25.4	32.1	64	10.0	19.4	2.1	6.6	66	12.1	0.0	0.0	0.0	14.5	46.0
	dec-15	39.2	26.0	32.6	64	9.4	18.8	2.0	6.5	65	2.8	0.0	0.0	0.0	0.0	14.0
	dec-16	39.8	26.7	33.3	63	8.7	17.9	1.9	6.4	64	7.9	0.0	0.0	25.0	2.7	12.0
Jun	dec-17	40.2	27.1	33.6	63	8.4	17.5	1.9	6.4	64	3.8	0.0	10.0	9.0	0.0	0.0
	dec-18	39.9	27.1	33.5	63	7.7	16.9	2.1	6.3	63	14.0	0.0	70.0	0.0	0.0	0.0
	dec-19	39.5	27.2	33.4	62	6.9	16.1	2.2	6.2	62	7.0	2.0	13.0	0.0	0.0	20.0
Jul	dec-20	39.4	27.2	33.3	62	6.5	15.7	2.3	6.2	62	7.4	30.0	5.0	2.0	0.0	0.0
	dec-21	39.2	26.9	33.1	62	7.1	16.3	2.3	6.3	63	9.5	23.0	0.0	0.0	24.6	0.0
	dec-22	39.0	26.5	32.8	62	7.8	17.1	2.2	6.4	64	13.5	20.0	0.0	0.0	37.6	10.0
Aug	dec-23	38.9	26.4	32.6	62	8.2	17.5	2.1	6.4	64	27.7	103.0	0.0	20.0	0.0	15.5
	dec-24	38.7	26.1	32.4	63	8.1	17.4	2.0	6.2	62	8.4	0.0	0.0	0.0	34.2	8.0
	dec-25	38.4	25.8	32.1	64	8.0	17.2	1.8	6.0	60	9.8	0.0	12.0	0.0	37.2	0.0
Sep	dec-26	38.3	25.7	32.0	65	8.0	16.9	1.8	5.8	58	22.6	30.0	0.0	32.0	16.8	34.0
	dec-27	37.8	24.7	31.3	66	8.6	17.2	1.6	5.6	56	35.9	18.0	44.5	18.0	39.2	60.0
	dec-28	37.0	23.5	30.3	67	9.3	17.6	1.3	5.3	53	35.1	12.5	14.0	64.0	13.0	72.0
Oct	dec-29	36.6	22.9	29.8	67	9.7	17.5	1.2	5.1	51	24.1	0.0	9.0	35.0	22.4	54.0
	dec-30	35.9	21.9	28.9	68	10.0	17.3	1.2	4.9	49	17.8	36.8	52.0	0.0	0.0	0.0
	dec-31	35.0	20.5	27.7	68	10.3	17.0	1.3	4.7	47	19.3	23.0	26.0	0.0	7.4	40.0
Nov	dec-32	34.5	19.8	27.1	69	10.5	16.7	1.3	4.5	45	5.4	0.0	27.0	0.0	0.0	0.0
	dec-33	33.8	19.2	26.5	69	10.1	16.1	1.3	4.3	43	19.4	11.0	84.0	0.0	0.0	2.0
	dec-34	32.8	18.5	25.6	70	9.7	15.5	1.4	4.1	41	3.2	0.0	0.0	0.0	0.0	16.0
Dec	dec-35	32.3	18.2	25.2	70	9.5	15.1	1.4	4.0	40	13.4	36.9	0.0	25.0	0.0	5.0
	dec-36	32.1	18.6	25.3	70	9.0	14.8	1.4	3.9	39	4.0	20.0	0.0	0.0	0.0	0.0
Year		36.1	23.1	29.6	67	8.4	5963	1.8	5.3	1918	421	462	448	284	308	605
										P/PET	0.2	0.2	0.2	0.1	0.2	0.3

station: Al Jaruba rainfall
latitude: 14°23' 1986
longitude: 43°26'
altitude: 300 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	1986
	dec-1	33.0	18.5	25.8	63	8.5	14.4	1.5	4.1	41	2.0
Jan	dec-2	33.0	17.6	25.3	63	8.5	14.7	1.5	4.2	42	0.0
	dec-3	33.3	18.6	26.0	65	8.6	15.1	1.5	4.3	43	0.0
	dec-4	33.6	20.0	26.8	68	8.7	15.7	1.6	4.5	45	0.0
Feb	dec-5	33.8	20.7	27.3	69	8.7	16.2	1.6	4.7	47	7.0
	dec-6	34.2	21.1	27.7	68	8.8	16.8	1.7	5.0	50	0.0
	dec-7	34.8	21.7	28.3	67	8.9	17.4	1.8	5.3	53	14.0
Mar	dec-8	35.1	22.0	28.6	67	9.0	17.8	1.9	5.5	55	49.0
	dec-9	36.0	22.8	29.4	64	9.2	18.3	1.9	5.8	58	6.0
	dec-10	37.2	23.8	30.5	61	9.4	18.8	2.0	6.3	63	29.0
Apr	dec-11	37.8	24.3	31.1	59	9.5	19.0	2.0	6.5	65	0.0
	dec-12	38.1	24.8	31.4	60	9.6	19.1	2.0	6.5	65	0.0
	dec-13	38.4	25.4	31.9	62	9.7	19.2	1.9	6.5	65	22.0
May	dec-14	38.6	25.7	32.2	63	9.7	19.2	1.9	6.5	65	27.0
	dec-15	39.4	26.5	33.0	58	9.7	19.1	2.1	6.9	69	25.0
	dec-16	40.5	27.6	34.0	51	9.8	19.0	2.4	7.5	75	0.0
Jun	dec-17	41.0	28.1	34.6	48	9.8	19.0	2.6	7.8	78	0.0
	dec-18	41.0	28.0	34.5	48	9.8	19.0	2.6	7.9	79	0.0
	dec-19	40.9	27.9	34.4	47	9.8	19.0	2.7	7.9	79	2.0
Jul	dec-20	40.9	27.8	34.4	47	9.8	19.1	2.7	8.0	80	0.0
	dec-21	40.9	27.7	34.3	47	9.7	19.0	2.7	7.9	79	7.0
	dec-22	40.8	27.5	34.2	48	9.6	18.9	2.6	7.8	78	0.0
Aug	dec-23	40.8	27.4	34.1	48	9.5	18.9	2.6	7.8	78	0.0
	dec-24	40.3	26.8	33.6	52	9.4	18.7	2.3	7.2	72	34.0
	dec-25	39.7	26.1	32.9	57	9.3	18.4	1.8	6.4	64	11.0
Sep	dec-26	39.4	25.7	32.6	60	9.2	18.2	1.5	6.0	60	33.0
	dec-27	39.0	25.1	32.1	58	9.1	17.7	1.5	5.9	59	65.0
	dec-28	38.5	24.3	31.4	55	9.0	17.2	1.5	5.7	57	11.0
Oct	dec-29	38.3	23.9	31.1	54	8.9	16.7	1.5	5.5	55	0.0
	dec-30	37.5	23.2	30.4	55	8.8	16.1	1.5	5.3	53	0.0
	dec-31	36.4	22.3	29.4	56	8.7	15.5	1.6	5.0	50	0.0
Nov	dec-32	35.9	21.8	28.9	56	8.6	15.0	1.6	4.8	48	2.0
	dec-33	35.0	21.3	28.2	58	8.5	14.6	1.6	4.5	45	0.0
	dec-34	33.7	20.7	27.2	61	8.4	14.3	1.5	4.2	42	6.0
Dec	dec-35	33.1	20.4	26.8	63	8.4	14.1	1.5	4.1	41	7.0
	dec-36	33.1	19.5	26.3	63	8.4	14.2	1.5	4.1	41	0.0
Year		37.3	23.8	30.6	58	9.1	6235	1.9	5.9	2137	359
										P/PET	0.2

station: Zabid (agro-)meteorological
latitude: 14°11 average 1970-1974, 1979, 1982-1984, 1989-1993
longitude: 43°26'
altitude: 100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1972	1973	1974	1979	1982	1983	1984	1989	1990	1991	1992	1993
	dec-1	30.1	19.7	24.9	72	8.1	14.2	1.6	3.8	38	0.4	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	29.8	19.5	24.7	72	7.8	14.1	1.7	3.8	38	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
	dec-3	30.0	19.9	24.9	73	7.7	14.4	1.8	4.0	40	16.4	11.4	0.0	0.0	12.0	0.0	17.0	10.5	0.0	0.0	0.0	0.0	160.0
	dec-4	30.2	20.3	25.3	73	7.6	14.8	1.9	4.2	42	5.9	0.0	0.0	0.0	0.0	5.0	27.0	8.0	3.5	39.0	0.0	0.0	0.0
Feb	dec-5	30.3	20.6	25.5	73	7.6	15.2	2.0	4.3	43	4.4	0.0	0.0	0.0	0.0	15.0	5.0	0.0	0.0	0.0	41.0	0.0	0.0
	dec-6	31.0	21.0	26.0	72	7.8	15.8	1.9	4.6	46	0.5	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	3.0	0.0	0.0	0.0
	dec-7	31.9	21.5	26.7	71	8.0	16.5	1.9	4.8	48	0.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar	dec-8	32.3	21.8	27.1	71	8.1	17.0	1.9	5.0	50	2.2	0.2	0.0	18.2	0.0	0.0	7.0	0.0	0.0	0.0	5.0	0.0	0.0
	dec-9	33.1	22.4	27.7	69	8.4	17.6	1.9	5.3	53	2.0	0.0	0.4	3.6	0.0	24.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-10	34.1	23.2	28.6	67	8.8	18.2	1.9	5.6	56	4.4	0.0	0.0	0.0	0.0	0.0	4.0	0.0	8.0	3.0	0.0	41.0	0.0
Apr	dec-11	34.6	23.6	29.1	66	9.0	18.6	1.9	5.8	58	0.8	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	5.5
	dec-12	35.2	24.2	29.7	66	9.2	18.7	1.9	5.9	59	4.7	12.2	0.0	0.0	0.0	0.0	27.0	0.0	27.0	0.0	0.0	0.0	0.0
	dec-13	36.0	25.0	30.5	66	9.4	18.9	1.8	6.1	61	10.9	0.0	7.5	0.0	0.0	5.0	0.0	51.0	48.0	0.0	25.5	0.0	15.0
May	dec-14	36.5	25.4	30.9	65	9.5	18.9	1.8	6.1	61	7.6	0.0	3.1	0.0	0.0	0.0	11.0	9.0	0.0	0.0	0.0	0.0	44.0
	dec-15	37.0	26.0	31.5	64	9.1	18.5	1.9	6.2	62	8.1	0.0	0.0	10.5	2.0	0.0	34.0	0.0	0.0	0.0	31.0	6.0	30.0
	dec-16	37.6	26.9	32.3	63	8.7	17.9	1.9	6.2	62	3.8	3.7	0.0	0.2	0.0	0.0	23.0	0.0	0.0	2.5	0.0	24.0	0.0
Jun	dec-17	38.0	27.3	32.6	62	8.4	17.6	2.0	6.3	63	0.3	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
	dec-18	37.8	27.4	32.6	62	8.2	17.3	2.1	6.3	63	0.4	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	37.6	27.5	32.5	61	7.8	16.9	2.2	6.3	63	4.6	0.0	0.0	8.0	1.5	0.0	0.0	4.0	3.0	0.0	3.0	11.0	34.0
Jul	dec-20	37.5	27.5	32.5	60	7.6	16.8	2.3	6.3	63	7.1	0.0	0.0	4.9	0.0	12.5	0.0	6.0	3.0	59.0	5.0	2.0	0.0
	dec-21	37.4	27.3	32.3	61	7.7	17.0	2.2	6.3	63	4.2	0.0	3.6	2.8	0.0	13.0	0.0	0.0	1.0	10.0	0.0	10.0	17.0
	dec-22	37.2	27.0	32.1	63	8.0	17.3	2.1	6.2	62	4.0	0.6	1.1	13.6	0.0	9.0	0.0	0.0	0.0	0.0	0.0	22.5	8.0
Aug	dec-23	37.2	26.8	32.0	64	8.1	17.4	2.0	6.1	61	9.3	3.7	0.0	17.4	21.8	8.0	0.0	0.0	0.0	0.0	0.0	9.0	56.0
	dec-24	36.9	26.5	31.7	65	8.1	17.4	1.8	5.9	59	14.9	12.5	4.7	27.8	12.5	4.0	7.0	17.0	12.0	8.2	0.0	48.0	54.0
	dec-25	36.5	26.0	31.3	67	8.1	17.3	1.6	5.6	56	19.3	10.2	7.5	56.2	30.0	10.5	9.0	4.0	19.0	2.3	22.0	17.5	10.0
Sep	dec-26	36.4	25.8	31.1	67	8.1	17.1	1.5	5.5	55	25.5	5.8	10.6	32.6	18.0	9.5	1.0	36.0	89.0	48.1	0.0	70.7	25.0
	dec-27	35.7	24.9	30.3	67	8.5	17.1	1.5	5.3	53	23.4	16.1	39.0	33.0	18.0	16.0	13.0	0.0	17.0	69.0	18.5	56.0	21.0
	dec-28	34.9	23.7	29.3	67	8.9	17.2	1.4	5.2	52	21.2	6.2	1.0	2.2	2.0	45.3	0.0	0.0	7.0	69.5	0.0	142.0	22.0
Oct	dec-29	34.5	23.1	28.8	67	9.2	17.0	1.4	5.0	50	8.3	9.0	4.9	0.0	0.0	21.5	6.0	0.0	1.0	0.0	0.0	0.0	45.0
	dec-30	33.8	22.3	28.0	67	9.2	16.6	1.4	4.8	48	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	19.0	2.0
	dec-31	32.9	21.1	27.0	67	9.3	16.2	1.5	4.6	46	0.9	0.0	1.5	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	32.4	20.5	26.5	67	9.4	15.8	1.5	4.4	44	4.3	0.0	0.0	0.0	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	31.8	20.4	26.1	68	9.2	15.3	1.5	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	31.0	20.2	25.6	70	8.9	14.8	1.5	4.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	30.6	20.1	25.3	71	8.8	14.6	1.5	3.9	39	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
	dec-36	30.3	19.9	25.1	72	8.5	14.3	1.6	3.8	38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		34.2	23.5	28.8	67	8.5	6004	1.8	5.2	1875	223	96	92	231	118	236	195	146	239	315	159	479	561
										P/PET	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3

station: As Zuhra (agro-)meteorological
latitude: 15°44' average 1973, 1977, 1981-1988
longitude: 43°01'
altitude: 70 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)										
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1973	1977	1981	1982	1983	1984	1985	1986	1987	1988
	dec-1	32.0	19.7	25.8	78	6.4	10.5	1.7	3.0	30	0.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	31.6	19.5	25.6	79	5.6	10.1	1.7	2.9	29	5.6	0.0	0.0	0.0	34.4	13.0	0.0	0.0	0.0	0.0	9.0
	dec-3	31.9	19.7	25.8	79	5.8	10.5	1.7	3.1	31	0.8	0.0	0.0	0.0	0.0	4.8	2.5	0.0	0.0	0.5	0.0
	dec-4	32.2	20.0	26.1	78	6.1	11.1	1.8	3.3	33	1.6	0.0	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	0.0
Feb	dec-5	32.4	20.2	26.3	78	6.2	11.6	1.8	3.5	35	2.3	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
	dec-6	33.1	20.7	26.9	78	6.8	12.5	1.9	3.7	37	0.5	0.0	0.0	0.0	0.0	3.5	0.0	1.5	0.0	0.0	0.0
	dec-7	34.0	21.3	27.6	77	7.5	13.5	1.9	4.1	41	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	1.0	0.0
Mar	dec-8	34.4	21.6	28.0	77	7.9	14.2	1.9	4.3	43	0.8	0.0	0.0	0.3	0.0	6.0	0.0	0.0	1.4	0.0	0.0
	dec-9	35.6	22.1	28.9	75	8.4	14.9	1.9	4.6	46	0.6	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	1.5	0.0
	dec-10	37.1	22.8	30.0	73	9.0	15.7	1.8	5.0	50	8.3	0.0	6.2	11.8	0.0	0.0	0.0	29.5	24.1	11.8	0.0
Apr	dec-11	37.9	23.2	30.6	72	9.3	16.2	1.8	5.1	51	4.4	0.0	0.0	15.3	0.0	8.5	0.0	9.0	10.8	0.0	0.0
	dec-12	38.4	24.3	31.3	70	9.1	16.0	1.8	5.3	53	3.5	0.0	0.0	7.0	0.0	0.0	0.0	27.5	0.0	0.0	0.0
	dec-13	39.0	25.7	32.3	67	8.8	15.7	1.8	5.4	54	4.6	0.0	0.0	1.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0
May	dec-14	39.3	26.4	32.9	65	8.6	15.5	1.8	5.5	55	14.9	0.0	0.0	5.0	16.0	77.0	50.5	0.0	0.0	0.0	0.0
	dec-15	39.7	26.9	33.3	66	8.3	15.2	1.8	5.5	55	6.2	2.5	0.0	0.0	0.0	20.0	35.0	2.0	0.2	2.7	0.0
	dec-16	40.2	27.5	33.8	67	8.0	14.8	1.8	5.4	54	0.1	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Jun	dec-17	40.4	27.8	34.1	67	7.8	14.6	1.8	5.4	54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	40.0	27.9	34.0	66	7.4	14.2	2.0	5.4	54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	39.5	28.0	33.8	65	6.9	13.8	2.2	5.5	55	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0
Jul	dec-20	39.3	28.1	33.7	65	6.7	13.6	2.2	5.5	55	1.5	0.0	0.0	0.0	9.0	6.2	0.0	0.0	0.0	0.0	0.0
	dec-21	39.3	28.1	33.7	66	6.7	13.6	2.1	5.4	54	2.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	9.5	1.2	9.0
	dec-22	39.4	28.0	33.7	67	6.7	13.6	1.9	5.2	52	11.3	5.6	45.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	57.8
Aug	dec-23	39.4	28.0	33.7	68	6.7	13.6	1.8	5.1	51	12.0	1.8	105.0	0.0	0.0	1.4	0.0	8.8	3.0	0.0	0.2
	dec-24	39.2	27.5	33.4	69	6.9	13.7	1.7	5.0	50	5.3	0.0	0.0	9.3	4.0	0.0	0.0	3.0	24.7	12.0	0.0
	dec-25	38.9	26.9	32.9	70	7.2	13.8	1.6	4.9	49	5.0	6.0	0.0	11.9	20.8	0.0	0.0	0.8	10.1	0.0	0.0
Sep	dec-26	38.8	26.6	32.7	70	7.3	13.8	1.5	4.7	47	7.8	0.0	0.0	19.5	2.4	0.0	19.0	9.3	17.7	3.0	6.7
	dec-27	38.4	26.0	32.2	71	7.6	13.8	1.5	4.6	46	12.7	6.0	0.0	4.0	12.7	1.0	37.0	0.9	16.8	10.0	38.4
	dec-28	37.8	25.2	31.5	72	8.0	13.8	1.5	4.5	45	14.5	14.4	17.5	12.5	89.5	0.0	0.0	10.6	0.0	0.0	0.0
Oct	dec-29	37.5	24.8	31.2	72	8.2	13.6	1.4	4.3	43	7.5	0.0	32.5	0.0	7.0	35.0	0.0	0.0	0.0	0.0	0.0
	dec-30	36.5	24.1	30.3	72	8.3	13.3	1.5	4.1	41	7.8	0.0	77.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	35.2	23.2	29.2	73	8.5	13.0	1.5	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	34.5	22.8	28.7	73	8.6	12.7	1.5	3.7	37	0.6	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0
	dec-33	33.9	21.9	27.9	74	8.4	12.2	1.6	3.5	35	0.7	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	33.2	20.6	26.9	76	8.1	11.8	1.6	3.3	33	8.2	0.0	0.0	0.0	3.5	72.0	0.0	0.0	6.5	0.0	0.0
Dec	dec-35	32.8	20.0	26.4	77	7.9	11.5	1.7	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	32.4	19.8	26.1	78	7.1	11.0	1.7	3.1	31	6.5	0.0	0.0	0.0	0.0	52.0	0.0	0.0	0.0	13.0	0.0
Year		36.5	24.1	30.3	72	7.6	4830	1.8	4.4	1601	158	40	306	98	210	322	144	149	129	61	121
										P/PET	0.1	0.0	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1

station: Al Khalifah rainfall
latitude: 14°43' average 1992-1993
longitude: 43°19'
altitude: 140 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)	
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	1992	1993
	dec-1	33.1	16.1	24.6	68	8.5	14.3	1.2	3.7	37	0.0	0.0
Jan	dec-2	32.6	16.3	24.4	68	8.3	14.4	1.2	3.8	38	3.0	0.1
	dec-3	32.4	16.6	24.5	68	8.1	14.6	1.3	3.9	39	0.0	21.9
	dec-4	32.2	17.0	24.6	67	7.8	14.8	1.4	4.1	41	0.0	0.0
Feb	dec-5	32.1	17.3	24.7	67	7.7	15.2	1.5	4.3	43	0.0	0.0
	dec-6	33.2	17.5	25.3	65	7.8	15.8	1.5	4.5	45	0.0	0.0
	dec-7	34.7	17.8	26.2	62	8.0	16.4	1.4	4.8	48	0.0	0.0
Mar	dec-8	35.5	18.0	26.7	61	8.1	16.9	1.4	5.0	50	0.0	0.0
	dec-9	36.1	18.9	27.5	60	8.3	17.4	1.4	5.2	52	0.0	0.0
	dec-10	37.0	20.1	28.5	58	8.6	18.0	1.3	5.5	55	27.4	0.0
Apr	dec-11	37.4	20.7	29.0	58	8.8	18.3	1.3	5.6	56	0.0	6.8
	dec-12	38.0	21.1	29.6	58	9.1	18.7	1.3	5.8	58	0.0	0.0
	dec-13	38.9	21.8	30.3	58	9.6	19.1	1.3	5.9	59	0.0	0.0
May	dec-14	39.3	22.1	30.7	58	9.8	19.3	1.2	6.0	60	0.0	98.2
	dec-15	39.8	22.4	31.1	57	9.6	19.0	1.3	6.0	60	0.0	22.0
	dec-16	40.4	22.7	31.5	57	9.2	18.5	1.3	6.0	60	0.0	31.5
Jun	dec-17	40.7	22.9	31.8	57	9.1	18.3	1.3	6.0	60	0.0	0.0
	dec-18	40.7	23.5	32.1	55	8.8	18.0	1.5	6.2	62	0.0	0.3
	dec-19	40.7	24.3	32.5	53	8.4	17.6	1.8	6.4	64	0.0	1.5
Jul	dec-20	40.7	24.8	32.7	52	8.2	17.4	1.9	6.6	66	0.0	2.5
	dec-21	39.8	23.9	31.9	56	8.4	17.7	1.8	6.3	63	0.0	24.0
	dec-22	38.7	22.7	30.7	61	8.7	18.0	1.6	5.9	59	0.0	30.1
Aug	dec-23	38.1	22.1	30.1	64	8.9	18.2	1.5	5.8	58	25.5	25.5
	dec-24	38.1	21.8	29.9	65	8.8	18.1	1.3	5.6	56	90.4	19.2
	dec-25	38.0	21.3	29.7	66	8.7	17.8	1.2	5.3	53	10.4	27.4
Sep	dec-26	38.0	21.1	29.5	67	8.6	17.5	1.1	5.2	52	20.1	20.1
	dec-27	37.7	20.5	29.1	67	8.8	17.4	1.0	5.0	50	17.2	72.0
	dec-28	37.2	19.8	28.5	67	9.1	17.3	1.0	4.8	48	18.4	11.2
Oct	dec-29	37.0	19.5	28.3	67	9.3	17.0	0.9	4.7	47	9.4	41.0
	dec-30	36.6	18.6	27.6	65	9.4	16.6	1.0	4.5	45	0.0	2.5
	dec-31	36.0	17.5	26.7	63	9.5	16.2	1.0	4.3	43	0.0	0.0
Nov	dec-32	35.7	16.9	26.3	62	9.5	15.8	1.0	4.1	41	0.0	0.0
	dec-33	35.2	16.5	25.8	63	9.3	15.2	1.0	4.0	40	0.0	0.0
	dec-34	34.6	15.9	25.2	65	9.1	14.8	1.1	3.8	38	5.8	0.0
Dec	dec-35	34.3	15.6	24.9	67	9.0	14.5	1.1	3.7	37	0.0	0.0
	dec-36	33.7	15.8	24.8	67	8.7	14.4	1.1	3.7	37	0.0	0.0
Year		36.8	19.7	28.3	62	8.8	6087	1.3	5.1	1821	228	458
										P/PET	0.1	0.3

station: Al Mahatt rainfall
latitude: 14°18' average 1978-1983, 1986
longitude: 43°18'
altitude: 100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)							
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1978	1979	1980	1981	1982	1983	1986
	dec-1	29.9	19.8	24.9	72	8.1	14.1	1.6	3.8	38	0.9	6.5	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	29.7	19.6	24.6	72	7.8	14.1	1.7	3.8	38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	29.8	19.9	24.9	73	7.7	14.4	1.8	4.0	40	10.9	0.0	38.0	0.0	38.0	0.0	0.0	0.0
	dec-4	30.1	20.4	25.2	73	7.6	14.8	1.9	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feb	dec-5	30.2	20.6	25.4	73	7.6	15.2	2.0	4.3	43	4.9	10.0	0.0	0.0	0.0	0.0	21.0	3.0
	dec-6	30.9	21.0	25.9	72	7.8	15.8	1.9	4.5	45	3.1	0.0	0.0	0.0	0.0	20.0	2.0	0.0
	dec-7	31.7	21.6	26.7	71	8.0	16.5	1.9	4.8	48	1.6	0.0	0.0	0.0	0.0	0.0	0.0	11.3
Mar	dec-8	32.2	21.8	27.0	71	8.1	16.9	1.9	5.0	50	5.9	0.0	0.0	0.0	40.0	0.0	0.0	1.0
	dec-9	32.9	22.4	27.7	69	8.4	17.6	1.9	5.3	53	6.1	0.0	0.0	0.0	0.0	42.5	0.0	0.0
	dec-10	33.9	23.2	28.6	67	8.8	18.2	1.9	5.6	56	2.4	7.0	0.0	0.0	0.0	0.0	0.0	10.0
Apr	dec-11	34.4	23.6	29.0	66	9.0	18.6	1.9	5.8	58	5.7	0.0	0.0	0.0	40.0	0.0	0.0	0.0
	dec-12	35.0	24.2	29.6	66	9.2	18.7	1.9	5.9	59	2.9	0.0	0.0	0.0	20.0	0.0	0.5	0.0
	dec-13	35.9	25.0	30.5	66	9.4	18.9	1.8	6.0	60	1.1	0.0	0.0	0.0	8.0	0.0	0.0	0.0
May	dec-14	36.3	25.5	30.9	65	9.5	18.9	1.8	6.1	61	1.7	0.0	0.0	0.0	7.0	0.0	0.0	5.2
	dec-15	36.8	26.1	31.4	64	9.1	18.5	1.9	6.1	61	29.5	0.0	80.0	0.0	80.0	0.2	37.0	9.4
	dec-16	37.5	26.9	32.2	63	8.7	17.9	1.9	6.2	62	5.6	6.0	0.0	0.0	0.0	0.0	30.0	3.0
Jun	dec-17	37.8	27.3	32.6	62	8.4	17.6	2.0	6.2	62	8.1	56.4	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	37.6	27.4	32.5	62	8.2	17.3	2.1	6.3	63	0.6	0.0	0.0	0.0	0.0	0.0	0.0	4.0
	dec-19	37.4	27.5	32.4	61	7.8	16.9	2.2	6.3	63	4.3	0.0	0.0	0.0	30.2	0.0	0.0	0.0
Jul	dec-20	37.3	27.5	32.4	60	7.6	16.8	2.3	6.3	63	2.7	12.0	0.0	0.0	7.0	0.0	0.0	0.0
	dec-21	37.2	27.3	32.2	61	7.7	17.0	2.2	6.3	63	9.3	0.0	0.0	55.1	3.0	1.0	0.0	6.0
	dec-22	37.1	27.0	32.0	63	8.0	17.3	2.1	6.1	61	2.4	0.0	0.0	0.0	1.0	15.5	0.0	0.0
Aug	dec-23	37.0	26.9	31.9	64	8.1	17.4	2.0	6.1	61	6.0	40.0	0.0	2.1	0.0	0.0	0.0	0.0
	dec-24	36.7	26.5	31.6	65	8.1	17.4	1.8	5.9	59	29.4	15.2	133.0	41.8	3.5	0.0	0.0	12.2
	dec-25	36.4	26.1	31.2	67	8.1	17.3	1.6	5.6	56	29.1	0.0	39.0	100.0	30.6	31.0	0.0	3.2
Sep	dec-26	36.2	25.8	31.0	67	8.1	17.1	1.5	5.4	54	10.8	0.0	57.0	3.0	11.0	1.0	0.0	3.4
	dec-27	35.6	24.9	30.2	67	8.5	17.1	1.5	5.3	53	13.2	0.0	25.0	0.0	24.5	11.0	0.0	32.0
	dec-28	34.7	23.7	29.2	67	8.9	17.2	1.4	5.1	51	2.0	0.0	0.0	0.0	5.5	7.8	1.0	0.0
Oct	dec-29	34.3	23.1	28.7	67	9.2	17.0	1.4	5.0	50	15.4	10.0	37.0	0.0	0.0	30.0	31.0	0.0
	dec-30	33.6	22.3	27.9	67	9.2	16.6	1.4	4.8	48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	32.7	21.1	26.9	67	9.3	16.2	1.5	4.5	45	0.1	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Nov	dec-32	32.3	20.6	26.4	67	9.4	15.8	1.5	4.4	44	7.5	42.0	0.0	0.0	0.0	10.5	0.0	0.0
	dec-33	31.7	20.4	26.0	68	9.2	15.3	1.5	4.2	42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	30.8	20.2	25.5	70	8.9	14.8	1.5	4.0	40	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Dec	dec-35	30.4	20.1	25.3	71	8.8	14.6	1.5	3.9	39	1.0	0.0	0.0	0.0	0.0	1.2	0.0	6.0
	dec-36	30.2	20.0	25.1	72	8.5	14.3	1.6	3.8	38	5.4	38.0	0.0	0.0	0.0	0.0	0.0	0.0
Year		34.0	23.5	28.8	67	8.5	6001	1.8	5.2	1870	230	243	409	202	349	172	123	112
										P/PET	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1

station: Ad Dahi — rainfall
latitude: 15°13' — average 1984-1990
longitude: 43°04'
altitude: 90 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)							
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1984	1985	1986	1987	1988	1989	1990
	dec-1	30.2	19.9	25.1	71	7.7	11.6	1.6	3.2	32	0.4	0.0	0.0	0.0	0.4	1.6	0.5	0.0
Jan	dec-2	29.9	19.6	24.8	71	7.8	11.9	1.6	3.2	32	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0
	dec-3	30.3	20.1	25.2	70	7.6	12.1	1.6	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-4	30.7	20.7	25.7	69	7.3	12.2	1.6	3.5	35	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Feb	dec-5	30.9	21.0	26.0	68	7.2	12.5	1.6	3.7	37	0.8	0.0	0.0	5.5	0.0	0.0	0.0	0.0
	dec-6	31.5	21.6	26.5	67	7.2	13.0	1.6	3.9	39	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.5
	dec-7	32.2	22.3	27.2	66	7.3	13.4	1.5	4.1	41	0.7	0.0	0.0	4.5	0.3	0.0	0.0	0.0
Mar	dec-8	32.6	22.6	27.6	66	7.3	13.7	1.5	4.2	42	0.7	0.0	0.0	2.7	0.0	0.0	2.5	0.0
	dec-9	33.4	23.2	28.3	65	7.6	14.2	1.6	4.5	45	0.2	0.0	0.0	0.0	0.7	0.0	0.5	0.0
	dec-10	34.6	24.0	29.3	63	7.9	14.7	1.6	4.8	48	4.9	0.0	0.0	12.9	20.7	0.0	0.0	1.0
Apr	dec-11	35.1	24.5	29.8	62	8.0	15.0	1.7	5.0	50	0.4	0.0	2.8	0.0	0.0	0.3	0.0	0.0
	dec-12	35.9	25.0	30.4	61	8.0	15.0	1.6	5.0	50	9.5	0.0	64.4	0.0	0.0	1.1	0.0	1.0
	dec-13	36.9	25.7	31.3	59	7.9	14.9	1.5	5.1	51	7.0	0.0	49.2	0.0	0.0	0.0	0.0	0.0
May	dec-14	37.4	26.1	31.7	58	7.9	14.8	1.5	5.1	51	0.1	0.0	0.0	0.0	0.9	0.0	0.0	0.0
	dec-15	38.0	26.6	32.3	57	7.8	14.6	1.5	5.2	52	1.1	0.0	0.0	1.0	6.6	0.0	0.0	0.0
	dec-16	38.9	27.3	33.1	57	7.5	14.4	1.6	5.3	53	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Jun	dec-17	39.4	27.7	33.5	57	7.4	14.2	1.6	5.4	54	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	39.3	27.9	33.6	58	7.1	13.9	1.7	5.4	54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	39.1	28.2	33.7	60	6.7	13.5	1.9	5.4	54	0.5	0.0	3.4	0.0	0.0	0.0	0.0	0.0
Jul	dec-20	39.1	28.4	33.7	61	6.5	13.3	1.9	5.3	53	4.1	9.8	1.0	0.0	0.0	18.2	0.0	0.0
	dec-21	39.1	28.2	33.7	62	6.3	13.2	1.9	5.2	52	0.3	0.0	0.0	1.1	0.0	0.0	0.0	1.0
	dec-22	39.2	27.9	33.6	63	6.0	13.0	1.8	5.1	51	21.0	0.0	0.0	0.0	53.5	73.8	19.5	0.0
Aug	dec-23	39.2	27.8	33.5	63	5.9	12.8	1.7	5.0	50	1.8	0.0	1.5	7.5	3.7	0.0	0.0	0.0
	dec-24	39.0	27.3	33.1	63	6.3	13.2	1.6	4.9	49	7.1	0.3	0.9	26.4	16.6	4.8	0.0	1.0
	dec-25	38.6	26.6	32.6	62	6.9	13.6	1.4	4.8	48	12.2	0.5	23.4	27.9	0.0	6.2	4.5	23.0
Sep	dec-26	38.4	26.2	32.3	62	7.2	13.7	1.3	4.7	47	11.0	30.5	5.8	13.1	0.4	15.9	7.5	3.5
	dec-27	37.6	25.6	31.6	62	7.6	13.8	1.2	4.5	45	10.3	0.4	18.5	7.1	5.2	21.6	18.5	0.5
	dec-28	36.6	24.8	30.7	62	8.2	14.0	1.2	4.4	44	8.3	0.0	1.4	0.7	22.6	30.5	0.0	3.0
Oct	dec-29	36.0	24.4	30.2	62	8.5	13.9	1.1	4.2	42	5.8	0.0	0.0	0.0	0.0	23.9	17.0	0.0
	dec-30	35.0	23.6	29.3	63	8.5	13.5	1.2	4.0	40	2.3	0.0	15.3	0.0	0.0	0.0	0.5	0.0
	dec-31	33.7	22.6	28.2	65	8.6	13.1	1.4	3.9	39	0.9	0.0	0.0	6.5	0.0	0.0	0.0	0.0
Nov	dec-32	33.1	22.1	27.6	66	8.6	12.8	1.4	3.7	37	0.4	0.0	0.0	0.0	0.0	2.8	0.0	0.0
	dec-33	32.3	21.6	27.0	68	8.2	12.2	1.5	3.5	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	31.4	20.9	26.2	70	7.7	11.6	1.6	3.3	33	0.3	1.1	0.0	0.0	1.1	0.0	0.0	0.0
Dec	dec-35	30.9	20.6	25.7	71	7.4	11.3	1.7	3.2	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	30.6	20.3	25.4	71	7.5	11.4	1.6	3.2	32	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Year		35.2	24.2	29.7	64	7.5	4800	1.6	4.4	1583	113	43	188	117	133	201	72	36
										P/PET	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0

station: Moudia (agro-)meteorological
latitude: 13°56' average 1982-1990
longitude: 46°06'
altitude: 800 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)									
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1982	1983	1984	1985	1986	1987	1988	1989	1990
	dec-1	26.2	15.2	20.7	38	7.9	14.0	1.2	3.7	37										
Jan	dec-2	26.0	15.0	20.5	37	7.5	13.9	1.2	3.7	37	1.0	0.0	0.0	0.0	0.0	8.8	0.0	0.0	0.0	0.0
	dec-3	26.2	15.3	20.8	36	8.3	15.0	1.2	3.9	39										
	dec-4	26.5	15.8	21.1	35	9.4	16.6	1.1	4.1	41										
Feb	dec-5	26.6	16.0	21.3	34	10.0	17.6	1.1	4.3	43	25.7	5.0	152.0	0.0	0.0	0.0	0.0	0.0	19.0	29.8
	dec-6	27.6	16.6	22.1	36	10.0	18.1	1.2	4.6	46										
	dec-7	29.0	17.3	23.2	38	10.1	18.6	1.2	4.9	49										
Mar	dec-8	29.7	17.7	23.7	39	10.1	19.0	1.3	5.1	51	39.8	210.0	0.0	0.0	0.0	8.8	0.0	0.0	139.0	0.0
	dec-9	30.3	18.1	24.2	40	9.7	18.9	1.2	5.2	52										
	dec-10	31.0	18.6	24.8	41	9.2	18.6	1.1	5.2	52										
Apr	dec-11	31.4	18.9	25.2	41	8.9	18.4	1.1	5.2	52	20.6	0.0	107.0	0.0	6.0	29.0	0.0	10.6	32.5	0.0
	dec-12	32.3	19.6	26.0	41	8.5	18.0	1.1	5.2	52										
	dec-13	33.6	20.4	27.0	40	7.9	17.3	1.2	5.3	53										
May	dec-14	34.2	20.8	27.5	40	7.6	17.0	1.2	5.3	53	35.8	0.0	100.0	125.0	0.0	24.0	41.0	0.0	32.5	0.0
	dec-15	34.4	21.5	27.9	41	7.5	16.8	1.2	5.3	53										
	dec-16	34.6	22.4	28.5	42	7.4	16.6	1.1	5.2	52										
Jun	dec-17	34.8	22.8	28.8	43	7.3	16.4	1.1	5.2	52	13.9	0.0	0.0	85.0	25.0	0.0	15.0	0.0	0.0	0.0
	dec-18	34.8	23.6	29.2	42	7.6	16.7	1.3	5.5	55										
	dec-19	35.0	24.7	29.8	41	8.0	17.1	1.5	5.8	58										
Jul	dec-20	35.0	25.2	30.1	41	8.2	17.4	1.6	6.0	60	12.4	0.0	0.0	10.0	58.0	0.0	0.0	30.0	13.5	0.0
	dec-21	34.9	25.2	30.1	41	8.0	17.3	1.5	5.9	59										
	dec-22	34.8	25.2	30.0	40	7.8	17.1	1.4	5.8	58										
Aug	dec-23	34.8	25.1	29.9	40	7.7	17.0	1.4	5.7	57	14.8	15.0	0.0	0.0	18.0	0.0	70.5	20.0	0.0	9.3
	dec-24	34.6	24.4	29.5	40	8.0	17.3	1.3	5.7	57										
	dec-25	34.3	23.4	28.9	39	8.5	17.7	1.3	5.6	56										
Sep	dec-26	34.2	23.0	28.6	38	8.7	17.7	1.2	5.5	55	69.9	165.0	0.0	72.0	108.0	0.0	13.5	139.9	56.7	74.4
	dec-27	33.1	21.1	27.1	39	9.4	18.1	1.2	5.3	53										
	dec-28	31.6	18.5	25.1	39	10.4	18.7	1.2	5.1	51										
Oct	dec-29	30.9	17.3	24.1	39	10.9	18.8	1.2	4.9	49	4.8	0.0	35.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5
	dec-30	30.0	16.5	23.2	39	10.2	17.5	1.2	4.5	45										
	dec-31	28.8	15.4	22.1	39	9.2	16.1	1.2	4.2	42										
Nov	dec-32	28.2	14.9	21.5	39	8.7	15.2	1.2	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	27.7	15.2	21.4	39	8.7	14.9	1.2	3.8	38										
	dec-34	27.1	15.6	21.3	40	8.7	14.7	1.2	3.7	37										
Dec	dec-35	26.8	15.8	21.3	40	8.7	14.5	1.2	3.7	37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	26.5	15.5	21.0	39	8.3	14.2	1.2	3.7	37										
Year		31.0	19.4	25.2	39	8.7	6089	1.2	4.9	1757	239	395	394	292	215	71	140	201	293	122
										P/PET	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.1

station: Musaimer
latitude: 13°28'
longitude: 44°36'
altitude 600 m

rainfall
average 1973-1985

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	dec-1	28.3	19.6	23.9	58	7.9	14.1	1.6	4.0	40													
Jan	dec-2	27.8	19.6	23.7	62	7.5	14.0	1.6	3.9	39	6.9	0.0	0.0	4.0	0.0	0.0	18.7	0.0	0.0	1.8	50.3	0.0	7.8
	dec-3	28.4	19.9	24.2	64	8.3	15.1	1.6	4.1	41													
	dec-4	29.3	20.3	24.8	66	9.4	16.7	1.6	4.5	45													
Feb	dec-5	29.8	20.5	25.1	67	10.0	17.7	1.6	4.7	47	34	0.0	0.0	0.0	0.0	57.8	0.0	0.0	0.0	0.0	347.3	0.0	0.0
	dec-6	30.4	21.0	25.7	63	10.0	18.2	1.6	5.0	50													
	dec-7	31.2	21.7	26.5	57	10.1	18.7	1.6	5.3	53													
Mar	dec-8	31.7	22.1	26.9	54	10.1	19.1	1.6	5.5	55	19	4.2	0.0	0.0	0.0	0.0	0.0	0.0	111.5	110.0	0.0	0.0	0.0
	dec-9	32.3	22.4	27.4	54	9.7	19.0	1.6	5.6	56													
	dec-10	33.2	22.9	28.0	53	9.2	18.6	1.5	5.7	57													
Apr	dec-11	33.6	23.1	28.4	52	8.9	18.4	1.5	5.8	58	17	0.0	0.0	46.9	40.0	0.0	0.0	0.0	48.5	0.0	60.7	0.0	7.0
	dec-12	34.4	23.5	28.9	52	8.5	18.0	1.6	5.8	58													
	dec-13	35.5	24.0	29.7	52	7.9	17.3	1.6	5.8	58													
May	dec-14	36.0	24.2	30.1	51	7.6	16.9	1.6	5.8	58	67	59.4	0.0	12.0	148.4	85.0	25.0	0.0	61.0	50.9	274.0	46.0	39.2
	dec-15	36.3	24.8	30.5	50	7.5	16.7	1.6	5.9	59													
	dec-16	36.7	25.5	31.1	47	7.4	16.5	1.6	5.9	59													
Jun	dec-17	36.9	25.9	31.4	46	7.3	16.4	1.6	6.0	60	13	14.8	4.0	8.0	12.0	0.0	0.0	45.0	36.0	0.0	0.0	22.0	10.4
	dec-18	37.0	26.3	31.7	50	7.6	16.7	1.6	6.0	60													
	dec-19	37.2	26.9	32.1	54	8.0	17.1	1.6	6.0	60													
Jul	dec-20	37.3	27.2	32.3	56	8.2	17.4	1.6	6.0	60	53	35.9	18.3	43.6	5.2	21.0	0.0	61.0	64.0	150.9	141.5	9.0	90.0
	dec-21	37.4	27.4	32.4	57	8.0	17.3	1.6	6.0	60													
	dec-22	37.5	27.7	32.6	59	7.8	17.1	1.6	6.0	60													
Aug	dec-23	37.6	27.8	32.7	60	7.7	17.0	1.6	5.9	59	51	53.1	35.7	22.0	21.0	36.8	118.5	137.6	72.0	104.1	0.0	0.0	7.0
	dec-24	36.9	27.0	32.0	60	8.0	17.3	1.6	5.9	59													
	dec-25	36.1	26.0	31.0	60	8.5	17.7	1.7	5.9	59													
Sep	dec-26	35.7	25.5	30.6	60	8.7	17.7	1.7	5.8	58	96	48.8	247.2	19.7	60.4	49.1	58.0	115.0	236.3	121.1	11.4	114.2	68.0
	dec-27	35.1	25.0	30.0	58	9.4	18.2	1.7	5.8	58													
	dec-28	34.4	24.2	29.3	56	10.4	18.8	1.6	5.8	58													
Oct	dec-29	34.1	23.9	29.0	55	10.9	18.8	1.6	5.7	57	33	0.0	40.2	15.2	152.2	35.5	0.0	114.1	35.7	0.0	0.0	0.0	0.0
	dec-30	32.9	22.6	27.7	52	10.2	17.6	1.6	5.2	52													
	dec-31	31.3	20.8	26.0	49	9.2	16.2	1.5	4.8	48													
Nov	dec-32	30.5	20.0	25.2	48	8.7	15.3	1.5	4.5	45	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.3	0.0	0.0	0.0
	dec-33	30.1	19.8	24.9	49	8.7	15.0	1.5	4.4	44													
	dec-34	29.6	19.5	24.6	50	8.7	14.8	1.5	4.2	42													
Dec	dec-35	29.4	19.4	24.4	51	8.7	14.7	1.5	4.1	41	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.4	0.0	0.0	0.0
	dec-36	28.8	19.5	24.2	55	8.3	14.3	1.5	4.1	41													
Year		33.3	23.3	28.3	55	8.7	6103	1.6	5.3	1914	396	216	345	171	439	285	220	473	665	631	885	191	229
											0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.3	0.5	0.1	0.1

station: Mukiras
latitude: 13°56'
longitude: 45°40'
altitude: 2150 m

(agro-)meteorological
average 1978-1979, 1988

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)			
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1978	1979	1988
	dec-1	18.9	6.6	12.7	58	7.9	13.6	1.0	2.7	27				
Jan	dec-2	18.6	6.3	12.5	62	7.5	13.5	1.0	2.7	27	0.0	0.0	0.0	0.0
	dec-3	18.4	7.0	12.7	64	8.3	14.7	1.1	2.9	29				
	dec-4	18.1	8.0	13.0	66	9.4	16.3	1.3	3.2	32				
Feb	dec-5	18.0	8.5	13.2	67	10.0	17.4	1.3	3.4	34	30.3	91.0	0.0	0.0
	dec-6	19.3	9.0	14.2	63	10.0	17.9	1.3	3.6	36				
	dec-7	21.1	9.7	15.4	57	10.1	18.4	1.4	4.0	40				
Mar	dec-8	22.0	10.1	16.0	54	10.1	18.8	1.4	4.2	42	0.0	0.0	0.0	0.0
	dec-9	22.7	10.6	16.6	54	9.7	18.6	1.4	4.3	43				
	dec-10	23.7	11.3	17.5	53	9.2	18.2	1.3	4.3	43				
Apr	dec-11	24.2	11.6	17.9	52	8.9	17.9	1.3	4.4	44	10.5	0.0	0.0	31.5
	dec-12	25.0	12.5	18.8	52	8.5	17.4	1.3	4.4	44				
	dec-13	26.2	13.7	19.9	52	7.9	16.7	1.4	4.4	44				
May	dec-14	26.8	14.3	20.5	51	7.6	16.3	1.4	4.4	44	10.6	10.7	16.5	4.6
	dec-15	27.7	14.7	21.2	50	7.5	16.0	1.3	4.5	45				
	dec-16	28.9	15.3	22.1	47	7.4	15.8	1.3	4.5	45				
Jun	dec-17	29.6	15.7	22.6	46	7.3	15.7	1.3	4.5	45	8.1	0.0	21.7	2.6
	dec-18	28.5	15.5	22.0	50	7.6	16.0	1.3	4.5	45				
	dec-19	27.2	15.4	21.3	54	8.0	16.5	1.2	4.4	44				
Jul	dec-20	26.5	15.3	20.9	56	8.2	16.8	1.2	4.3	43	82.5	136.1	11.4	100.0
	dec-21	26.2	15.3	20.7	57	8.0	16.6	1.1	4.3	43				
	dec-22	25.7	15.3	20.5	59	7.8	16.4	1.1	4.2	42				
Aug	dec-23	25.5	15.3	20.4	60	7.7	16.3	1.1	4.2	42	73.8	27.0	92.0	102.3
	dec-24	25.4	14.5	20.0	60	8.0	16.7	1.2	4.2	42				
	dec-25	25.3	13.5	19.4	60	8.5	17.1	1.2	4.2	42				
Sep	dec-26	25.3	13.0	19.1	60	8.7	17.2	1.2	4.2	42	45.2	43.0	1.2	91.5
	dec-27	24.7	12.4	18.5	58	9.4	17.8	1.3	4.2	42				
	dec-28	24.0	11.5	17.7	56	10.4	18.5	1.4	4.2	42				
Oct	dec-29	23.6	11.1	17.4	55	10.9	18.7	1.4	4.2	42	0.0	0.0	0.0	0.0
	dec-30	22.6	10.3	16.4	52	10.2	17.4	1.4	3.8	38				
	dec-31	21.1	9.3	15.2	49	9.2	15.8	1.3	3.5	35				
Nov	dec-32	20.4	8.8	14.6	48	8.7	14.9	1.3	3.3	33	0.0	0.0	0.0	0.0
	dec-33	20.2	8.2	14.2	49	8.7	14.6	1.2	3.1	31				
	dec-34	19.8	7.4	13.6	50	8.7	14.4	1.0	2.9	29				
Dec	dec-35	19.7	7.0	13.3	51	8.7	14.2	0.9	2.8	28	0.0	0.0	0.0	0.0
	dec-36	19.3	6.8	13.0	55	8.3	13.9	0.9	2.7	27				
Year		23.3	11.4	17.4	55	8.7	5929	1.2	3.9	1392	261	308	143	333
										P/PET	0.2	0.2	0.1	0.2

station: Habilin (agro-)meteorological
latitude: 13°32' average 1988-1992
longitude: 44°49'
altitude: 600 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1988	1989	1990	1991	1992
	dec-1	28.3	19.6	23.9	58	7.9	14.1	1.6	4.0	40						
Jan	dec-2	27.8	19.6	23.7	62	7.5	14.0	1.6	3.9	39	0.6	0.0	0.0	0.0	3.0	0.0
	dec-3	28.4	19.9	24.2	64	8.3	15.1	1.6	4.1	41						
	dec-4	29.3	20.3	24.8	66	9.4	16.6	1.6	4.5	45						
Feb	dec-5	29.8	20.5	25.1	67	10.0	17.7	1.6	4.7	47	1.6	0.0	2.0	0.0	0.0	6.0
	dec-6	30.4	21.0	25.7	63	10.0	18.2	1.6	5.0	50						
	dec-7	31.2	21.7	26.5	57	10.1	18.7	1.6	5.3	53						
Mar	dec-8	31.7	22.1	26.9	54	10.1	19.1	1.6	5.5	55	31.6	0.0	124.0	0.0	14.0	20.0
	dec-9	32.3	22.4	27.4	54	9.7	19.0	1.6	5.6	56						
	dec-10	33.2	22.9	28.0	53	9.2	18.6	1.5	5.7	57						
Apr	dec-11	33.6	23.1	28.4	52	8.9	18.4	1.5	5.8	58	3.4	0.0	7.0	10.0	0.0	0.0
	dec-12	34.4	23.5	28.9	52	8.5	18.0	1.6	5.8	58						
	dec-13	35.5	24.0	29.7	52	7.9	17.3	1.6	5.8	58						
May	dec-14	36.0	24.2	30.1	51	7.6	16.9	1.6	5.8	58	13.8	0.0	10.0	22.0	7.0	30.0
	dec-15	36.3	24.8	30.5	50	7.5	16.7	1.6	5.9	59						
	dec-16	36.7	25.5	31.1	47	7.4	16.5	1.6	5.9	59						
Jun	dec-17	36.9	25.9	31.4	46	7.3	16.4	1.6	6.0	60	7.0	15.1	0.0	10.0	0.0	10.0
	dec-18	37.0	26.3	31.7	50	7.6	16.7	1.6	6.0	60						
	dec-19	37.2	26.9	32.1	54	8.0	17.1	1.6	6.0	60						
Jul	dec-20	37.3	27.2	32.3	56	8.2	17.4	1.6	6.0	60	14.0	10.0	2.0	40.0	15.0	3.0
	dec-21	37.4	27.4	32.4	57	8.0	17.3	1.6	6.0	60						
	dec-22	37.5	27.7	32.6	59	7.8	17.1	1.6	6.0	60						
Aug	dec-23	37.6	27.8	32.7	60	7.7	17.0	1.6	5.9	59	30.4	88.0	7.0	17.0	0.0	40.0
	dec-24	36.9	27.0	32.0	60	8.0	17.3	1.6	5.9	59						
	dec-25	36.1	26.0	31.0	60	8.5	17.7	1.7	5.9	59						
Sep	dec-26	35.7	25.5	30.6	60	8.7	17.7	1.7	5.8	58	60.0	62.8	92.0	120.0	0.0	25.0
	dec-27	35.1	25.0	30.0	58	9.4	18.2	1.7	5.8	58						
	dec-28	34.4	24.2	29.3	56	10.4	18.8	1.6	5.8	58						
Oct	dec-29	34.1	23.9	29.0	55	10.9	18.8	1.6	5.7	57	6.8	0.0	0.0	27.0	7.0	0.0
	dec-30	32.9	22.6	27.7	52	10.2	17.6	1.6	5.2	52						
	dec-31	31.3	20.8	26.0	49	9.2	16.2	1.5	4.8	48						
Nov	dec-32	30.5	20.0	25.2	48	8.7	15.3	1.5	4.5	45	3.5	0.0	0.0	0.0	14.0	3.5
	dec-33	30.1	19.8	24.9	49	8.7	15.0	1.5	4.4	44						
	dec-34	29.6	19.5	24.6	50	8.7	14.7	1.5	4.2	42						
Dec	dec-35	29.4	19.4	24.4	51	8.7	14.6	1.5	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	28.8	19.5	24.2	55	8.3	14.3	1.5	4.1	41						
Year		33.3	23.3	28.3	55	8.7	6100	1.6	5.3	1914	173	176	244	246	60	138
										P/PET	0.1	0.1	0.1	0.1	0.0	0.1

station: Madram rainfall
latitude: 13°20' average 1973-1978, 1980-1985
longitude: 44°41'
altitude: 450 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1973	1974	1975	1976	1977	1978	1980	1981	1982	1983	1984	1985
	dec-1	24.6	14.2	19.4	62	7.9	14.1	0.8	3.1	31													
Jan	dec-2	24.4	13.9	19.2	63	7.5	14.0	0.9	3.1	31	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	11.6	0.0	0.0
	dec-3	24.8	14.2	19.5	61	8.3	15.1	0.9	3.4	34													
	dec-4	25.3	14.5	19.9	58	9.4	16.7	1.0	3.8	38													
Feb	dec-5	25.6	14.7	20.1	57	10.0	17.7	1.1	4.0	40	6.5	0.0	0.0	0.0	0.0	0.0	32.2	0.0	0.0	0.0	45.5	0.0	0.0
	dec-6	26.3	15.4	20.8	57	10.0	18.2	1.0	4.2	42													
	dec-7	27.3	16.3	21.8	58	10.1	18.7	0.8	4.3	43													
Mar	dec-8	27.8	16.8	22.3	58	10.1	19.1	0.7	4.4	44	26.7	0.0	0.0	0.0	1.2	0.0	0.0	8.0	5.3	290.2	16.2	0.0	0.0
	dec-9	28.2	17.1	22.6	56	9.7	19.0	0.7	4.5	45													
	dec-10	28.6	17.5	23.0	53	9.2	18.6	0.7	4.6	46													
Apr	dec-11	28.9	17.6	23.3	52	8.9	18.4	0.7	4.6	46	8.6	0.0	3.8	0.0	16.5	16.9	0.0	31.8	12.0	0.0	21.7	0.0	0.0
	dec-12	29.5	18.1	23.8	51	8.5	18.0	0.8	4.6	46													
	dec-13	30.4	18.6	24.5	51	7.9	17.3	0.8	4.6	46													
May	dec-14	30.9	18.9	24.9	51	7.6	16.9	0.9	4.6	46	15.5	18.5	9.8	0.0	6.7	34.0	0.0	43.0	40.1	10.3	7.9	15.4	0.0
	dec-15	31.7	19.6	25.6	50	7.5	16.7	0.8	4.6	46													
	dec-16	32.7	20.6	26.7	48	7.4	16.5	0.7	4.6	46													
Jun	dec-17	33.2	21.1	27.2	48	7.3	16.4	0.7	4.6	46	20.4	16.3	0.0	0.0	2.1	0.0	0.0	60.4	62.3	67.1	0.0	36.0	0.0
	dec-18	32.8	21.1	27.0	50	7.6	16.7	0.7	4.6	46													
	dec-19	32.3	21.2	26.7	52	8.0	17.1	0.7	4.7	47													
Jul	dec-20	32.0	21.3	26.6	54	8.2	17.3	0.7	4.7	47	23.1	31.7	19.2	0.0	30.1	6.8	39.0	92.6	33.8	24.1	0.0	0.0	0.0
	dec-21	31.9	21.1	26.5	54	8.0	17.2	0.7	4.7	47													
	dec-22	31.7	21.0	26.3	53	7.8	17.1	0.7	4.6	46													
Aug	dec-23	31.6	20.9	26.3	53	7.7	17.0	0.7	4.6	46	18.0	6.7	25.5	29.0	18.9	0.0	43.7	0.0	7.4	47.0	0.0	16.9	20.7
	dec-24	31.4	20.4	25.9	54	8.0	17.3	0.7	4.6	46													
	dec-25	31.0	19.7	25.3	55	8.5	17.7	0.7	4.6	46													
Sep	dec-26	30.8	19.3	25.1	56	8.7	17.7	0.7	4.5	45	37.7	13.3	28.9	65.7	16.1	39.8	93.0	37.5	77.5	45.5	0.0	15.1	19.8
	dec-27	30.0	18.4	24.2	54	9.4	18.2	0.7	4.5	45													
	dec-28	29.0	17.2	23.1	51	10.4	18.8	0.8	4.4	44													
Oct	dec-29	28.4	16.7	22.5	50	10.9	18.8	0.8	4.3	43	9.0	0.0	0.0	20.5	20.1	0.0	0.0	0.0	0.0	29.9	37.5	0.0	0.0
	dec-30	27.9	15.9	21.9	51	10.2	17.6	0.8	4.0	40													
	dec-31	27.2	14.9	21.0	52	9.2	16.2	0.7	3.6	36													
Nov	dec-32	26.9	14.4	20.6	53	8.7	15.3	0.7	3.4	34	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.7	13.5	0.0	0.0
	dec-33	26.3	14.4	20.4	55	8.7	15.0	0.7	3.3	33													
	dec-34	25.5	14.5	20.0	58	8.7	14.8	0.7	3.2	32													
Dec	dec-35	25.1	14.6	19.9	60	8.7	14.7	0.7	3.1	31	8.5	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	79.2	14.3	0.0	0.0
	dec-36	24.9	14.4	19.6	61	8.3	14.3	0.7	3.1	31													
Year		28.8	17.5	23.2	54	8.7	6106	0.8	4.2	1502	178	95	87	115	112	98	208	273	238	619	168	83	41
										P/PET	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.1	0.0

station: Karish
latitude: 13°21'
longitude: 44°30'
altitude: 750 m

rainfall
average 1974-1976, 1978-1979, 1981-1985

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)										
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1974	1975	1976	1978	1979	1981	1982	1983	1984	1985
	dec-1	26.2	18.5	22.3	58	7.9	14.1	1.6	3.8	38											
Jan	dec-2	25.7	18.6	22.1	62	7.5	14.0	1.6	3.8	38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	26.3	18.9	22.6	64	8.3	15.1	1.6	4.0	40											
	dec-4	27.2	19.3	23.2	66	9.4	16.7	1.6	4.3	43											
Feb	dec-5	27.7	19.5	23.6	67	10.0	17.7	1.6	4.5	45	36.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	365.0	0.0	0.0
	dec-6	28.7	20.0	24.3	63	10.0	18.2	1.6	4.8	48											
	dec-7	30.0	20.7	25.4	57	10.1	18.7	1.6	5.2	52											
Mar	dec-8	30.7	21.1	25.9	54	10.1	19.1	1.6	5.4	54	16.4	6.1	0.0	0.0	0.0	0.0	0.0	158.0	0.0	0.0	0.0
	dec-9	31.4	21.4	26.4	54	9.7	19.0	1.6	5.5	55											
	dec-10	32.2	21.8	27.0	53	9.2	18.6	1.5	5.6	56											
Apr	dec-11	32.7	22.1	27.4	52	8.9	18.4	1.5	5.6	56	7.9	0.0	0.0	9.2	0.0	0.0	0.0	0.0	70.0	0.0	0.0
	dec-12	33.5	22.4	27.9	52	8.5	18.0	1.6	5.7	57											
	dec-13	34.5	22.9	28.7	52	7.9	17.3	1.6	5.7	57											
May	dec-14	35.1	23.2	29.1	51	7.6	16.9	1.6	5.7	57	23.0	48.3	0.0	0.0	94.0	0.0	0.0	0.0	8.0	75.0	4.5
	dec-15	35.4	23.7	29.5	50	7.5	16.7	1.6	5.7	57											
	dec-16	35.7	24.4	30.1	47	7.4	16.5	1.6	5.8	58											
Jun	dec-17	35.9	24.8	30.4	46	7.3	16.4	1.6	5.8	58	7.3	4.6	0.0	14.9	15.0	0.0	0.0	0.0	0.0	36.5	2.0
	dec-18	36.1	25.3	30.7	50	7.6	16.7	1.6	5.8	58											
	dec-19	36.2	25.9	31.1	54	8.0	17.1	1.6	5.9	59											
Jul	dec-20	36.3	26.2	31.3	56	8.2	17.3	1.6	5.9	59	25.1	10.2	0.0	25.0	51.0	0.0	0.0	88.0	45.0	4.7	26.8
	dec-21	36.4	26.4	31.4	57	8.0	17.2	1.6	5.9	59											
	dec-22	36.4	26.6	31.5	59	7.8	17.1	1.6	5.8	58											
Aug	dec-23	36.5	26.8	31.6	60	7.7	17.0	1.6	5.8	58	30.6	28.4	10.7	37.5	94.0	40.0	59.0	0.0	0.0	12.1	23.8
	dec-24	35.8	26.0	30.9	60	8.0	17.3	1.6	5.8	58											
	dec-25	35.0	25.0	30.0	60	8.5	17.7	1.7	5.7	57											
Sep	dec-26	34.5	24.5	29.5	60	8.7	17.7	1.7	5.7	57	56.1	0.0	63.9	38.8	84.0	25.0	60.0	65.0	145.0	12.9	66.7
	dec-27	34.0	23.9	29.0	58	9.4	18.2	1.7	5.6	56											
	dec-28	33.3	23.2	28.2	56	10.4	18.8	1.6	5.6	56											
Oct	dec-29	33.0	22.8	27.9	55	10.9	18.8	1.6	5.5	55	1.7	0.0	12.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	31.4	21.5	26.5	52	10.2	17.6	1.6	5.1	51											
	dec-31	29.4	19.8	24.6	49	9.2	16.2	1.5	4.6	46											
Nov	dec-32	28.4	18.9	23.6	48	8.7	15.3	1.5	4.3	43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	28.0	18.7	23.4	49	8.7	15.0	1.5	4.2	42											
	dec-34	27.5	18.5	23.0	50	8.7	14.8	1.5	4.1	41											
Dec	dec-35	27.3	18.4	22.8	51	8.7	14.7	1.5	4.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	26.7	18.4	22.6	55	8.3	14.3	1.5	3.9	39											
Year		32.0	22.2	27.1	55	8.7	6106	1.6	5.2	1862	205	98	87	131	338	65	119	311	633	141	124
											0.1	0.1	0.0	0.1	0.2	0.0	0.1	0.2	0.3	0.1	0.1

station: Seiyun '(agro-)meteorological
latitude: 15°56' average 1983-1993
longitude: 48°45'
altitude: 700 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)											
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	dec-1	28.9	9.6	19.3	49	8.8	13.5	0.8	2.8	28	0.5	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	28.8	9.4	19.1	50	8.7	13.7	0.8	2.9	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	29.6	10.6	20.1	49	8.7	14.2	0.9	3.2	32	1.4	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.5
	dec-4	30.7	12.1	21.4	49	8.8	14.7	0.9	3.5	35	3.8	0.0	0.0	0.0	4.1	0.0	0.0	0.0	38.0	0.0	0.0	0.0
Feb	dec-5	31.2	12.9	22.0	49	8.8	15.3	1.0	3.7	37	2.9	11.5	0.0	11.5	7.4	0.0	0.0	0.0	1.9	0.0	0.0	0.0
	dec-6	32.4	13.9	23.1	46	8.8	15.7	1.0	4.1	41	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.5	0.0	0.0	0.0
	dec-7	33.9	15.2	24.5	43	8.7	16.1	1.1	4.4	44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mar	dec-8	34.7	15.8	25.2	41	8.7	16.5	1.1	4.7	47	9.8	0.0	0.0	0.0	0.0	34.0	0.0	74.1	0.0	0.0	0.0	0.0
	dec-9	35.4	16.7	26.0	40	8.7	16.9	1.1	4.8	48	6.9	0.3	0.0	0.0	0.0	26.5	0.0	37.4	0.0	12.2	0.0	0.0
	dec-10	36.3	17.8	27.1	39	8.8	17.3	1.1	5.0	50	21.6	58.3	0.0	0.0	9.1	13.6	0.0	51.2	4.1	58.3	43.0	0.5
Apr	dec-11	36.8	18.4	27.6	39	8.8	17.5	1.1	5.1	51	2.8	2.3	0.0	0.0	9.4	9.9	0.0	0.0	0.0	2.3	0.0	6.7
	dec-12	37.8	19.0	28.4	37	9.2	17.9	1.1	5.3	53	1.6	0.8	0.0	0.2	0.0	0.0	0.5	8.5	0.0	0.8	0.0	6.9
	dec-13	39.2	19.7	29.5	34	9.7	18.3	1.1	5.5	55	1.8	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
May	dec-14	39.9	20.1	30.0	33	10.0	18.4	1.1	5.6	56	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0
	dec-15	40.6	20.8	30.7	32	9.6	18.1	1.1	5.6	56	0.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
	dec-16	41.6	21.7	31.6	30	9.1	17.6	1.0	5.5	55	0.2	0.0	0.0	0.0	0.0	1.5	0.0	1.0	0.0	0.0	0.0	0.0
Jun	dec-17	42.1	22.1	32.1	29	8.8	17.4	1.0	5.4	54	2.1	0.0	0.0	0.0	23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	42.3	23.2	32.7	30	8.5	17.1	1.1	5.7	57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	42.5	24.6	33.6	31	8.1	16.9	1.3	6.0	60	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.0	0.0
Jul	dec-20	42.6	25.3	34.0	31	7.9	16.7	1.4	6.2	62	0.4	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.7	1.0	0.0	2.2
	dec-21	42.4	25.3	33.9	32	8.0	16.8	1.3	6.1	61	2.0	0.0	1.1	0.0	1.8	0.0	5.7	1.0	10.0	0.0	0.0	2.2
	dec-22	42.2	25.2	33.7	33	8.0	16.8	1.2	5.9	59	3.7	0.0	0.0	1.6	5.1	17.2	1.5	0.8	0.5	8.1	6.2	0.0
Aug	dec-23	42.0	25.2	33.6	34	8.0	16.7	1.2	5.9	59	3.6	29.5	0.0	0.0	0.0	1.0	0.0	0.4	0.0	7.0	1.0	1.2
	dec-24	41.1	23.7	32.4	34	8.3	16.9	1.1	5.6	56	2.0	0.0	0.0	1.0	8.0	4.1	0.0	0.0	0.0	8.5	0.0	0.0
	dec-25	39.8	21.8	30.8	34	8.8	17.0	1.0	5.2	52	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sep	dec-26	39.1	20.9	30.0	34	9.0	16.9	0.9	5.0	50	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	1.5	0.0
	dec-27	37.9	19.1	28.5	35	9.2	16.7	1.0	4.8	48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-28	36.2	16.7	26.4	36	9.4	16.5	1.0	4.5	45	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	0.0
Oct	dec-29	35.3	15.5	25.4	37	9.5	16.1	1.1	4.3	43	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	0.0	0.0
	dec-30	34.0	14.4	24.2	38	9.4	15.5	0.9	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-31	32.3	12.8	22.6	39	9.4	14.9	0.8	3.4	34	0.4	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	31.4	12.1	21.7	39	9.4	14.5	0.7	3.1	31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	30.7	11.4	21.0	42	9.2	14.0	0.7	3.0	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
	dec-34	29.7	10.5	20.1	46	9.0	13.6	0.7	2.8	28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	29.2	10.0	19.6	48	9.0	13.5	0.7	2.7	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	29.1	9.8	19.5	48	8.9	13.4	0.7	2.8	28	0.2	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
Year		36.1	17.3	26.7	39	8.9	5797	1.0	4.6	1643	73	109	22	21	68	110	8	176	73	112	73	33
										P/PET	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0

station: Marib (agro-)meteorological
latitude: 15°26' average 1987-1989, 1991
longitude: 45°20'
altitude: 1100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)				
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1987	1988	1989	1991
	dec-1	27.0	10.1	18.6	38	9.8	14.5	1.1	3.2	32	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	27.2	10.6	18.9	37	9.8	14.8	1.1	3.3	33	0.8	0.0	0.0	3.0	0.0
	dec-3	28.2	11.8	20.0	37	9.6	15.0	1.2	3.6	36	0.0	0.0	0.0	0.0	0.0
	dec-4	29.6	13.3	21.5	37	9.3	15.3	1.3	4.0	40	0.0	0.0	0.0	0.0	0.0
Feb	dec-5	30.3	14.1	22.2	37	9.1	15.7	1.3	4.2	42	7.3	0.0	24.0	0.0	5.0
	dec-6	31.3	15.3	23.3	35	8.9	16.1	1.3	4.5	45	3.8	0.0	0.0	15.0	0.0
	dec-7	32.6	16.8	24.7	33	8.7	16.3	1.4	4.8	48	1.6	6.2	0.0	0.0	0.0
Mar	dec-8	33.2	17.6	25.4	32	8.6	16.6	1.4	5.1	51	2.9	6.6	0.0	3.0	2.0
	dec-9	33.5	18.0	25.8	33	8.8	17.1	1.4	5.2	52	16.5	56.0	0.0	6.0	4.0
	dec-10	33.9	18.6	26.3	35	9.0	17.5	1.4	5.3	53	6.4	15.7	0.0	4.0	6.0
Apr	dec-11	34.1	18.9	26.5	36	9.1	17.7	1.4	5.4	54	9.5	30.5	7.4	0.0	0.0
	dec-12	35.6	19.8	27.7	30	9.4	18.0	1.4	5.6	56	7.3	0.0	21.1	2.0	6.0
	dec-13	37.5	20.9	29.2	22	9.9	18.3	1.4	5.8	58	0.8	0.0	0.0	0.0	3.0
May	dec-14	38.5	21.5	30.0	18	10.1	18.4	1.4	5.9	59	0.0	0.0	0.0	0.0	0.0
	dec-15	39.0	21.9	30.5	17	10.1	18.4	1.4	5.9	59	0.8	0.0	0.0	0.0	3.0
	dec-16	39.7	22.4	31.1	16	10.2	18.3	1.4	6.0	60	0.5	0.0	0.0	1.0	1.0
Jun	dec-17	40.0	22.7	31.4	16	10.2	18.3	1.4	6.0	60	4.0	0.0	3.0	13.0	0.0
	dec-18	40.3	23.3	31.8	18	9.6	17.8	1.5	6.2	62	5.9	0.0	0.4	0.0	23.0
	dec-19	40.6	24.2	32.4	21	8.8	17.2	1.7	6.5	65	0.8	1.3	2.0	0.0	0.0
Jul	dec-20	40.8	24.6	32.7	23	8.4	17.0	1.8	6.7	67	1.8	2.3	0.0	5.0	0.0
	dec-21	40.7	24.7	32.7	23	8.8	17.3	1.8	6.7	67	1.3	1.5	1.8	0.0	2.0
	dec-22	40.6	24.8	32.7	23	9.3	17.7	1.8	6.7	67	2.0	0.0	7.9	0.0	0.0
Aug	dec-23	40.6	24.9	32.8	23	9.5	17.9	1.8	6.7	67	0.5	0.0	1.1	0.0	1.0
	dec-24	40.0	24.1	32.0	21	9.5	17.8	1.7	6.4	64	0.0	0.0	0.0	0.0	0.0
	dec-25	39.1	23.0	31.1	19	9.5	17.7	1.5	6.0	60	3.8	0.0	0.0	0.0	15.0
Sep	dec-26	38.7	22.5	30.6	18	9.5	17.4	1.4	5.7	57	0.0	0.0	0.0	0.0	0.0
	dec-27	37.1	20.8	28.9	20	9.9	17.4	1.3	5.3	53	1.0	0.0	0.0	4.0	0.0
	dec-28	34.9	18.5	26.7	23	10.4	17.4	1.2	4.9	49	4.0	0.0	0.0	16.0	0.0
Oct	dec-29	33.8	17.3	25.6	24	10.6	17.1	1.2	4.6	46	0.0	0.0	0.0	0.0	0.0
	dec-30	32.2	15.7	24.0	26	10.5	16.5	1.2	4.2	42	0.0	0.0	0.0	0.0	0.0
	dec-31	30.1	13.6	21.9	29	10.4	15.9	1.1	3.8	38	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	29.1	12.5	20.8	30	10.4	15.5	1.1	3.6	36	0.0	0.0	0.0	0.0	0.0
	dec-33	28.2	11.4	19.8	34	10.2	15.0	1.1	3.4	34	0.0	0.0	0.0	0.0	0.0
	dec-34	27.1	9.9	18.5	39	10.0	14.6	1.1	3.2	32	0.0	0.0	0.0	0.0	0.0
Dec	dec-35	26.5	9.2	17.9	41	9.9	14.4	1.1	3.1	31	0.0	0.0	0.0	0.0	0.0
	dec-36	26.7	9.7	18.2	40	9.9	14.4	1.1	3.2	32	0.0	0.0	0.0	0.0	0.0
Year		34.4	18.0	26.2	28	9.6	6025	1.4	5.0	1811	83	120	69	72	71
										P/PET	0.2	0.1	0.0	0.0	0.0

station: Beihan (agro-)meteorological
latitude: 14°48' average 1982-1988
longitude: 45°43'
altitude: 1150 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)							
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1982	1983	1984	1985	1986	1987	1988
	dec-1	26.5	9.9	18.2	44	7.0	12.6	1.1	3.1	31								
Jan	dec-2	26.4	9.7	18.1	43	6.7	12.7	1.2	3.3	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-3	27.2	10.7	19.0	42	7.2	13.4	1.3	3.5	35								
	dec-4	28.3	12.1	20.2	40	7.9	14.3	1.4	3.9	39								
Feb	dec-5	28.9	12.8	20.8	39	8.2	15.0	1.5	4.2	42	2.6	0.0	18.1	0.0	0.0	0.0	0.0	0.0
	dec-6	30.1	14.8	22.4	40	8.3	15.5	1.5	4.5	45								
	dec-7	31.7	17.5	24.6	40	8.4	16.0	1.6	4.9	49								
Mar	dec-8	32.5	18.9	25.7	40	8.4	16.4	1.6	5.2	52	8.4	5.1	9.1	5.1	0.0	0.0	39.3	0.0
	dec-9	33.3	19.8	26.6	40	8.5	16.9	1.5	5.3	53								
	dec-10	34.4	21.0	27.7	39	8.7	17.3	1.4	5.5	55								
Apr	dec-11	35.0	21.6	28.3	39	8.8	17.5	1.4	5.5	55	36.0	3.4	65.0	3.4	37.7	35.1	94.7	12.8
	dec-12	35.3	21.8	28.6	36	8.5	17.3	1.4	5.6	56								
	dec-13	35.7	22.0	28.9	33	8.0	16.9	1.5	5.7	57								
May	dec-14	36.0	22.2	29.1	31	7.8	16.7	1.5	5.8	58	18.5	62.4	4.7	62.4	0.0	0.0	0.0	0.0
	dec-15	36.5	22.2	29.4	30	7.8	16.6	1.2	5.5	55								
	dec-16	37.1	22.3	29.7	28	7.7	16.5	0.9	5.0	50								
Jun	dec-17	37.5	22.4	29.9	28	7.7	16.4	0.7	4.8	48	1.3	0.0	8.9	0.0	0.0	0.0	0.0	0.0
	dec-18	37.9	23.2	30.6	31	8.2	16.8	0.8	5.0	50								
	dec-19	38.5	24.3	31.4	35	8.9	17.4	0.9	5.3	53								
Jul	dec-20	38.8	24.8	31.8	37	9.3	17.7	1.0	5.5	55	4.9	6.0	0.0	6.0	2.6	0.0	8.6	11.3
	dec-21	38.6	24.6	31.6	35	8.6	17.2	0.8	5.2	52								
	dec-22	38.3	24.4	31.4	32	7.7	16.5	0.6	4.8	48								
Aug	dec-23	38.2	24.3	31.2	31	7.2	16.1	0.5	4.5	45	9.7	5.0	23.5	5.0	10.0	11.9	12.7	0.0
	dec-24	37.4	22.8	30.1	31	8.1	16.7	0.8	4.9	49								
	dec-25	36.2	20.8	28.5	31	9.2	17.4	1.1	5.2	52								
Sep	dec-26	35.7	19.8	27.7	32	9.8	17.6	1.3	5.3	53	1.3	0.0	0.0	0.0	0.0	1.7	7.6	0.0
	dec-27	34.1	17.9	26.0	33	9.8	17.3	1.4	5.1	51								
	dec-28	32.1	15.5	23.8	36	9.8	16.9	1.5	4.8	48								
Oct	dec-29	31.1	14.2	22.6	37	9.8	16.4	1.5	4.5	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	30.3	13.4	21.8	39	9.5	15.7	1.4	4.2	42								
	dec-31	29.2	12.3	20.8	42	9.1	14.9	1.3	3.9	39								
Nov	dec-32	28.7	11.8	20.2	43	8.9	14.4	1.3	3.6	36	0.9	0.0	6.0	0.0	0.0	0.0	0.0	0.0
	dec-33	28.1	11.3	19.7	43	8.5	13.8	1.1	3.3	33								
	dec-34	27.3	10.6	18.9	44	8.0	13.2	0.9	3.0	30								
Dec	dec-35	26.9	10.2	18.6	44	7.7	12.9	0.8	2.9	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	26.7	10.1	18.4	44	7.4	12.7	0.9	3.0	30								
Year		33.0	17.7	25.3	37	8.4	5697	1.2	4.6	1654	84	82	135	82	50	49	163	24
										P/PET	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0

station: Nuqub (agro-)meteorological
latitude: 14°58' average 1965-1966, 1982-1992
longitude: 45°47'
altitude: 1050 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1966	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
	dec-1	27.4	9.6	18.5	37	7.3	12.8	1.1	3.2	32													
Jan	dec-2	27.5	9.6	18.5	39	7.0	12.8	1.0	3.2	32	0.9	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	7.8	0.0	0.0
	dec-3	29.2	10.8	20.0	38	7.2	13.3	1.2	3.5	35													
	dec-4	31.4	12.4	21.9	38	7.4	13.9	1.4	4.1	41													
Feb	dec-5	32.5	13.3	22.9	38	7.5	14.5	1.5	4.4	44	9.4	9.9	0.0	15.3	0.0	0.0	34.5	2.0	2.6	0.0	58.0	0.0	0.0
	dec-6	32.7	14.0	23.4	37	7.6	15.0	1.6	4.8	48													
	dec-7	33.0	15.0	24.0	35	7.7	15.5	1.8	5.1	51													
Mar	dec-8	33.2	15.5	24.3	35	7.8	16.0	1.9	5.4	54	20.1	0.0	113.0	10.7	0.7	0.0	1.5	56.2	0.0	67.9	0.0	11.8	0.0
	dec-9	33.7	16.5	25.1	34	8.2	16.6	1.9	5.6	56													
	dec-10	34.3	17.9	26.1	33	8.7	17.2	2.0	5.9	59													
Apr	dec-11	34.6	18.5	26.6	33	8.9	17.5	2.0	6.1	61	12.9	0.0	0.0	12.7	0.0	10.2	1.5	27.0	0.5	0.0	6.6	0.0	48.6
	dec-12	35.4	19.3	27.4	32	9.1	17.8	1.9	6.1	61													
	dec-13	36.5	20.4	28.5	32	9.4	18.0	1.7	6.1	61													
May	dec-14	37.1	20.9	29.0	31	9.5	18.0	1.6	6.0	60	3.5	0.0	0.0	0.0	18.8	0.0	21.7	0.0	0.0	0.0	0.0	5.2	0.0
	dec-15	37.6	21.3	29.4	31	9.2	17.7	1.5	6.0	60													
	dec-16	38.3	21.7	30.0	30	8.8	17.3	1.4	5.9	59													
Jun	dec-17	38.6	21.9	30.3	30	8.6	17.1	1.4	5.8	58	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	18.0	0.0	0.6	0.0
	dec-18	38.9	22.5	30.7	31	8.2	16.8	1.5	6.0	60													
	dec-19	39.3	23.4	31.3	31	7.7	16.4	1.6	6.2	62													
Jul	dec-20	39.5	23.8	31.6	32	7.4	16.2	1.7	6.3	63	8.8	0.0	0.0	0.0	3.6	5.1	0.5	0.0	12.0	22.0	71.0	0.0	0.0
	dec-21	39.4	23.6	31.5	32	7.5	16.4	1.8	6.4	64													
	dec-22	39.4	23.5	31.4	33	7.7	16.5	1.9	6.5	65													
Aug	dec-23	39.3	23.4	31.4	33	7.8	16.6	2.0	6.6	66	11.4	9.6	3.0	41.1	0.0	4.2	0.5	13.6	17.0	0.0	2.0	6.3	48.2
	dec-24	38.6	22.4	30.5	33	7.9	16.6	1.9	6.3	63													
	dec-25	37.7	21.1	29.4	32	8.0	16.5	1.7	5.9	59													
Sep	dec-26	37.3	20.4	28.8	32	8.0	16.3	1.6	5.7	57	0.8	0.0	0.0	0.0	0.0	0.9	6.2	0.0	3.7	0.0	0.0	0.0	0.0
	dec-27	35.8	18.3	27.0	32	8.2	16.1	1.5	5.3	53													
	dec-28	33.8	15.5	24.7	33	8.5	16.0	1.4	4.8	48													
Oct	dec-29	32.8	14.1	23.5	34	8.7	15.6	1.4	4.5	45	1.2	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0
	dec-30	31.8	13.1	22.4	34	8.8	15.2	1.3	4.2	42													
	dec-31	30.5	11.7	21.1	35	9.0	14.8	1.1	3.7	37													
Nov	dec-32	29.8	11.1	20.4	35	9.1	14.5	1.0	3.4	34	0.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	28.9	10.6	19.8	35	8.7	13.9	1.1	3.4	34													
	dec-34	27.8	10.0	18.9	35	8.1	13.2	1.2	3.4	34													
Dec	dec-35	27.2	9.7	18.5	35	7.8	12.9	1.3	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	27.3	9.6	18.5	36	7.5	12.8	1.2	3.3	33													
Year		34.1	16.8	25.5	34	8.2	5643	1.5	5.1	1824	71	20	119	84	23	20	66	100	36	108	145	24	111
										P/PET	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1

station: Al Kod (agro-)meteorological
latitude: 13°06' average 1981-1983, 1986-1991
longitude: 45°21'
altitude: 20 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)									
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1981	1982	1983	1986	1987	1988	1989	1990	1991
	dec-1	29.0	20.9	24.9	80	8.3	12.5	1.3	3.1	31	2.8	0.0	0.0	0.0	0.0	11.5	11.2	0.2	2.0	0.5
Jan	dec-2	28.7	21.2	25.0	80	8.1	12.6	1.3	3.1	31	1.2	0.0	10.0	0.4	0.0	0.0	0.0	0.5	0.0	0.0
	dec-3	28.9	21.4	25.2	80	8.2	12.9	1.3	3.2	32	0.8	0.0	0.0	3.0	0.0	0.0	0.0	4.0	0.0	0.0
	dec-4	29.1	21.6	25.4	81	8.3	13.4	1.4	3.4	34	14.2	0.0	0.0	108.5	3.8	0.0	0.0	14.8	1.0	0.0
Feb	dec-5	29.3	21.8	25.5	81	8.4	13.9	1.4	3.5	35	4.5	0.0	0.0	36.5	0.7	0.0	0.0	0.0	0.0	3.5
	dec-6	29.7	22.1	25.9	81	8.3	14.2	1.4	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-7	30.2	22.6	26.4	81	8.2	14.5	1.5	3.8	38	0.8	0.0	0.0	0.0	0.0	0.0	1.2	0.0	5.7	0.0
Mar	dec-8	30.5	22.9	26.7	81	8.2	14.7	1.5	3.9	39	10.2	7.0	0.0	0.0	0.2	84.3	0.0	0.5	0.0	0.0
	dec-9	30.9	23.2	27.0	81	8.4	15.1	1.4	4.0	40	9.0	0.0	0.0	0.0	0.0	0.0	0.0	79.7	1.0	0.0
	dec-10	31.4	23.5	27.5	81	8.7	15.5	1.3	4.2	42	3.0	0.0	0.0	0.0	0.0	1.0	0.0	26.3	0.0	0.0
Apr	dec-11	31.7	23.7	27.7	80	8.8	15.7	1.3	4.3	43	0.8	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-12	32.7	24.0	28.4	80	9.2	16.1	1.3	4.4	44	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.0	21.0	0.0
	dec-13	34.0	24.5	29.3	81	9.8	16.6	1.2	4.6	46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	dec-14	34.7	24.7	29.7	81	10.1	16.8	1.2	4.7	47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-15	35.0	25.3	30.2	80	9.7	16.3	1.2	4.7	47	6.7	10.5	0.0	50.2	0.0	0.0	0.0	0.0	0.0	0.0
	dec-16	35.5	26.2	30.8	78	9.2	15.8	1.3	4.7	47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jun	dec-17	35.7	26.6	31.1	77	9.0	15.5	1.3	4.7	47	0.4	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	35.6	26.8	31.2	77	8.6	15.1	1.4	4.6	46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-19	35.4	27.1	31.3	76	8.1	14.7	1.5	4.6	46	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Jul	dec-20	35.3	27.2	31.3	76	7.8	14.5	1.5	4.6	46	1.2	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0
	dec-21	35.2	27.0	31.1	76	7.8	14.5	1.5	4.6	46	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-22	34.9	26.8	30.9	76	7.9	14.7	1.5	4.5	45	0.8	2.0	0.0	1.0	1.3	0.0	2.3	0.0	0.0	1.0
Aug	dec-23	34.8	26.7	30.7	76	7.9	14.7	1.5	4.5	45	0.7	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	1.0
	dec-24	34.9	26.5	30.7	78	8.1	14.9	1.4	4.5	45	1.2	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	8.0
	dec-25	35.0	26.2	30.6	80	8.3	15.0	1.3	4.4	44	2.2	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0
Sep	dec-26	35.1	26.0	30.5	81	8.4	14.9	1.2	4.4	44	0.6	3.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0
	dec-27	34.4	24.6	29.5	80	8.8	15.1	1.2	4.3	43	3.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	34.0	0.0
	dec-28	33.4	22.8	28.1	79	9.3	15.3	1.2	4.1	41	0.7	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	4.5
Oct	dec-29	32.9	21.8	27.4	79	9.6	15.2	1.2	4.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	32.3	21.0	26.6	78	9.8	14.9	1.1	3.8	38	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
	dec-31	31.4	19.8	25.6	78	10.0	14.7	1.1	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	30.9	19.2	25.1	78	10.1	14.4	1.1	3.4	34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	30.4	19.6	25.0	79	9.6	13.7	1.1	3.3	33	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	29.8	20.0	24.9	79	9.0	13.0	1.2	3.1	31	0.4	0.0	0.0	1.1	0.0	2.3	0.0	0.0	0.0	0.0
Dec	dec-35	29.4	20.2	24.8	80	8.7	12.7	1.2	3.0	30	0.1	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	29.2	20.6	24.9	80	8.5	12.5	1.2	3.0	30	1.0	0.4	8.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Year		32.4	23.5	28.0	79	8.8	5266	1.3	4.0	1441	70	23	20	219	6	100	39	139	65	22
										P/PET	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.0

station: Riyan
latitude: 14°40'
longitude: 49°20'
altitude: 25 m

(agro-)meteorological
average 1942-1966, 1973-1990

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	dec-1	28.4	19.8	24.1	59	7.9	11.9	1.6	3.4	34													
Jan	dec-2	28.2	19.5	23.8	58	7.6	11.8	1.6	3.4	34	5.5	0.0	0.0	0.0	15.7	8.5	0.0	1.5	0.0	0.0	2.7	0.0	1.4
	dec-3	28.2	19.6	23.9	62	7.7	12.3	1.6	3.5	35													
	dec-4	28.3	19.8	24.0	67	7.9	12.9	1.7	3.6	36													
Feb	dec-5	28.3	19.8	24.1	70	8.1	13.4	1.8	3.6	36	8.3	0.0	0.0	0.0	20.6	82.1	0.0	0.0	79.2	0.0	2.9	0.0	0.0
	dec-6	28.8	20.6	24.7	69	8.1	13.8	1.8	3.8	38													
	dec-7	29.5	21.5	25.5	68	8.1	14.2	1.7	4.0	40													
Mar	dec-8	29.8	22.0	25.9	68	8.1	14.5	1.7	4.2	42	12.6	2.4	0.0	32.7	26.6	0.0	0.0	0.0	0.0	4.7	2.2	110.1	0.0
	dec-9	30.4	22.5	26.5	68	8.4	15.0	1.7	4.3	43													
	dec-10	31.2	23.2	27.2	69	8.8	15.6	1.7	4.5	45													
Apr	dec-11	31.6	23.5	27.5	69	9.0	15.8	1.7	4.6	46	16.6	0.0	0.0	7.3	0.0	82.5	0.0	0.4	0.0	0.0	0.0	9.8	12.6
	dec-12	32.0	24.3	28.2	70	9.1	16.0	1.6	4.7	47													
	dec-13	32.6	25.4	29.0	72	9.3	16.2	1.4	4.7	47													
May	dec-14	32.9	26.0	29.4	73	9.4	16.2	1.3	4.7	47	2.2	0.0	0.0	5.7	0.0	0.0	7.4	0.0	0.0	6.0	0.0	0.0	0.0
	dec-15	33.4	26.4	29.9	72	9.2	15.9	1.4	4.8	48													
	dec-16	34.0	27.0	30.5	71	9.0	15.6	1.6	4.9	49													
Jun	dec-17	34.4	27.2	30.8	70	8.9	15.5	1.6	4.9	49	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	13.3	0.0	0.0	0.0
	dec-18	34.1	26.8	30.4	70	8.5	15.1	1.6	4.8	48													
	dec-19	33.6	26.3	30.0	70	8.0	14.7	1.6	4.6	46													
Jul	dec-20	33.4	26.0	29.7	70	7.8	14.5	1.5	4.6	46	2.6	0.0	0.0	0.0	0.0	0.0	1.1	2.6	1.0	0.0	1.0	0.0	0.0
	dec-21	33.3	25.9	29.6	71	7.9	14.7	1.5	4.5	45													
	dec-22	33.1	25.7	29.4	72	8.1	14.9	1.5	4.5	45													
Aug	dec-23	33.0	25.6	29.3	72	8.2	15.0	1.5	4.5	45	2.4	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	2.0	0.0	0.0	0.0
	dec-24	32.7	25.6	29.2	72	8.3	15.1	1.5	4.5	45													
	dec-25	32.4	25.6	29.0	73	8.5	15.1	1.4	4.4	44													
Sep	dec-26	32.3	25.6	29.0	73	8.6	15.0	1.4	4.4	44	1.0	0.0	0.0	0.0	0.0	28.7	0.0	0.0	0.0	0.0	0.7	0.0	0.0
	dec-27	31.9	24.7	28.3	71	9.0	15.1	1.4	4.3	43													
	dec-28	31.5	23.4	27.4	68	9.5	15.3	1.5	4.3	43													
Oct	dec-29	31.2	22.8	27.0	66	9.8	15.1	1.5	4.2	42	2.5	0.0	37.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	31.0	21.9	26.5	63	9.8	14.7	1.5	4.1	41													
	dec-31	30.8	20.9	25.8	59	9.9	14.3	1.4	3.9	39													
Nov	dec-32	30.7	20.3	25.5	57	10.0	14.0	1.4	3.8	38	8.6	0.0	0.0	81.0	7.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	30.1	20.3	25.2	58	9.5	13.3	1.4	3.6	36													
	dec-34	29.3	20.3	24.8	59	8.9	12.6	1.5	3.5	35													
Dec	dec-35	29.0	20.3	24.7	60	8.6	12.3	1.5	3.4	34	5.5	5.0	0.0	18.7	7.8	12.0	17.9	0.0	0.0	0.0	0.0	0.2	0.0
	dec-36	28.7	20.1	24.4	59	8.2	12.0	1.6	3.4	34													
Year		31.2	23.2	27.2	67	8.6	5195	1.5	4.2	1509	69	7	38	145	78	214	39	11	80	26	10	120	14
										P/PET	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0

station: Lahej
latitude: 13°04'
longitude: 44°48'
altitude: 130 m

(agro-)meteorological
average 1973-1991

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
	dec-1	28.6	20.5	24.5	70	7.3	11.7	1.0	3.0	30													
Jan	dec-2	28.1	20.1	24.1	71	7.0	11.6	1.1	3.0	30	2.0	5.5	0.0	0.0	0.8	1.7	0.0	0.0	1.2	11.6	3.3	2.7	0.0
	dec-3	28.4	20.3	24.3	71	7.2	12.1	1.1	3.1	31													
	dec-4	28.8	20.5	24.6	71	7.4	12.6	1.1	3.3	33													
Feb	dec-5	29.0	20.6	24.8	71	7.5	13.1	1.2	3.4	34	6.9	0.0	0.0	32.4	79.7	0.0	0.0	0.0	0.0	0.0	6.1	0.9	0.0
	dec-6	29.8	21.0	25.4	70	7.6	13.6	1.2	3.6	36													
	dec-7	30.9	21.5	26.2	70	7.7	14.0	1.2	3.8	38													
Mar	dec-8	31.5	21.8	26.6	69	7.8	14.3	1.2	4.0	40	10.0	0.0	8.8	75.0	3.5	0.0	0.0	2.0	60.0	0.0	38.2	0.0	0.0
	dec-9	32.4	22.4	27.4	68	8.2	14.9	1.1	4.2	42													
	dec-10	33.5	23.3	28.4	67	8.7	15.5	1.1	4.4	44													
Apr	dec-11	34.1	23.7	28.9	66	8.9	15.8	1.1	4.5	45	4.9	0.0	0.0	0.0	7.2	0.0	0.0	1.2	6.5	0.0	7.0	18.4	0.0
	dec-12	34.7	24.3	29.5	66	9.1	16.0	1.1	4.7	47													
	dec-13	35.6	25.0	30.3	65	9.4	16.2	1.1	4.8	48													
May	dec-14	36.1	25.4	30.7	65	9.5	16.2	1.1	4.9	49	7.3	0.0	1.5	9.5	29.0	20.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0
	dec-15	36.6	26.1	31.4	64	9.2	15.8	1.1	4.9	49													
	dec-16	37.4	27.2	32.3	64	8.8	15.4	1.1	4.8	48													
Jun	dec-17	37.8	27.7	32.7	63	8.6	15.1	1.0	4.8	48	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
	dec-18	37.7	27.7	32.7	63	8.2	14.8	1.1	4.8	48													
	dec-19	37.5	27.7	32.6	63	7.7	14.3	1.1	4.7	47													
Jul	dec-20	37.4	27.7	32.6	62	7.4	14.1	1.1	4.7	47	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.6	3.6	1.0	0.0
	dec-21	37.4	27.4	32.4	63	7.5	14.3	1.1	4.7	47													
	dec-22	37.4	27.1	32.2	63	7.7	14.5	1.1	4.7	47													
Aug	dec-23	37.4	26.9	32.1	64	7.8	14.6	1.1	4.7	47	5.9	0.0	1.0	3.8	2.5	0.0	7.0	4.4	1.5	2.3	48.7	0.2	1.8
	dec-24	36.9	26.6	31.8	65	7.9	14.7	1.1	4.6	46													
	dec-25	36.3	26.2	31.3	66	8.0	14.7	1.0	4.5	45													
Sep	dec-26	36.0	26.1	31.0	67	8.0	14.6	1.0	4.4	44	12.9	0.0	20.3	57.8	0.0	2.4	17.2	0.3	1.2	25.5	0.0	5.5	0.0
	dec-27	35.0	25.0	30.0	67	8.2	14.6	1.0	4.3	43													
	dec-28	33.8	23.6	28.7	66	8.5	14.6	1.1	4.1	41													
Oct	dec-29	33.1	22.9	28.0	66	8.7	14.4	1.1	4.0	40	0.6	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
	dec-30	32.5	22.2	27.4	65	8.8	14.1	1.0	3.8	38													
	dec-31	31.7	21.4	26.6	64	9.0	13.8	1.0	3.6	36													
Nov	dec-32	31.3	21.0	26.1	64	9.1	13.6	1.0	3.5	35	0.5	0.0	0.0	1.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.5
	dec-33	30.7	21.1	25.9	65	8.7	12.9	1.0	3.3	33													
	dec-34	29.9	21.1	25.5	67	8.1	12.3	1.0	3.1	31													
Dec	dec-35	29.6	21.1	25.3	68	7.8	12.0	0.9	3.0	30	0.2	0.0	0.0	0.8	0.8	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.2
	dec-36	29.1	20.8	24.9	69	7.5	11.8	1.0	3.0	30													
Year		33.4	23.7	28.6	66	8.2	5083	1.1	4.1	1469	55	6	32	182	124	25	24	11	70	70	107	29	3
										P/PET	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

station: Giar
latitude: 13°13'
longitude: 45°18'
altitude: 150 m

(agro-)meteorological
average 1985-1990

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)						
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1985	1986	1987	1988	1989	1990
	dec-1	27.7	19.6	23.7	67	7.5	11.9	1.9	3.4	34							
Jan	dec-2	27.4	19.0	23.2	68	7.0	11.7	1.8	3.3	33	2.6	0.0	0.0	1.0	0.0	14.3	0.3
	dec-3	27.8	20.3	24.1	67	7.2	12.2	1.9	3.5	35							
	dec-4	28.3	22.0	25.2	67	7.5	12.8	2.0	3.8	38							
Feb	dec-5	28.6	22.9	25.8	67	7.7	13.3	2.1	4.0	40	0.8	0.0	0.0	1.1	0.0	3.7	0.0
	dec-6	29.0	22.8	25.9	67	7.8	13.8	2.1	4.2	42							
	dec-7	29.6	22.6	26.1	66	7.9	14.2	2.0	4.3	43							
Mar	dec-8	29.8	22.5	26.2	65	8.0	14.6	2.0	4.4	44	6.3	0.0	0.0	0.0	0.0	37.6	0.0
	dec-9	30.5	22.9	26.7	63	8.4	15.1	2.0	4.7	47							
	dec-10	31.5	23.5	27.5	61	8.9	15.7	2.0	5.0	50							
Apr	dec-11	32.0	23.8	27.9	60	9.1	16.0	2.0	5.1	51	4.3	0.0	1.8	0.0	0.0	8.6	15.4
	dec-12	32.9	23.8	28.3	60	9.0	15.9	1.8	5.1	51							
	dec-13	34.2	23.7	29.0	59	8.8	15.6	1.6	5.0	50							
May	dec-14	34.9	23.7	29.3	59	8.7	15.4	1.4	4.9	49	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-15	35.0	24.8	29.9	58	8.7	15.3	1.6	5.0	50							
	dec-16	35.2	26.2	30.7	57	8.7	15.2	1.8	5.3	53							
Jun	dec-17	35.3	26.9	31.1	57	8.7	15.2	1.9	5.4	54	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	35.1	27.1	31.1	57	8.4	14.9	1.8	5.3	53							
	dec-19	34.8	27.4	31.1	57	8.0	14.6	1.6	5.1	51							
Jul	dec-20	34.6	27.6	31.1	57	7.8	14.4	1.6	5.0	50	9.1	0.0	15.0	0.0	24.0	15.3	0.0
	dec-21	34.9	27.5	31.2	59	8.0	14.7	1.5	5.0	50							
	dec-22	35.3	27.4	31.3	60	8.3	15.0	1.5	5.0	50							
Aug	dec-23	35.5	27.3	31.4	61	8.4	15.2	1.5	5.1	51	2.1	0.0	0.0	0.0	7.4	5.0	0.0
	dec-24	35.3	27.0	31.2	61	8.5	15.3	1.5	5.0	50							
	dec-25	35.0	26.7	30.8	61	8.7	15.4	1.5	5.0	50							
Sep	dec-26	34.9	26.5	30.7	61	8.8	15.3	1.5	4.9	49	8.5	36.8	1.3	0.0	9.5	0.0	3.6
	dec-27	34.1	25.6	29.9	62	9.2	15.5	1.6	4.9	49							
	dec-28	33.1	24.4	28.8	63	9.7	15.6	1.8	4.8	48							
Oct	dec-29	32.6	23.9	28.2	64	9.9	15.5	1.9	4.7	47	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	32.0	22.3	27.1	62	9.9	15.1	1.8	4.5	45							
	dec-31	31.1	20.2	25.7	60	9.8	14.6	1.7	4.2	42							
Nov	dec-32	30.7	19.2	24.9	58	9.8	14.2	1.7	4.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	29.9	19.7	24.8	61	9.3	13.6	1.8	3.8	38							
	dec-34	28.9	20.4	24.6	65	8.7	12.9	1.8	3.6	36							
Dec	dec-35	28.3	20.8	24.6	67	8.4	12.5	1.9	3.5	35	0.8	0.0	0.0	0.0	0.0	4.8	0.0
	dec-36	28.0	20.2	24.1	67	7.9	12.2	1.9	3.4	34							
Year		32.0	23.7	27.9	62	8.5	5205	1.8	4.5	1634	34	37	18	2	41	89	19
										P/PET	0.0	0.0	0.0	0.0	0.0	0.1	0.0

station: Fiyush
latitude: 12°59'
longitude: 44°59'
altitude: 65 m

(agro-)meteorological
average 1973-1985, 1987-1988

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)												
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1987	1988
	dec-1	28.4	19.6	24.0	70	7.8	12.1	2.0	3.4	34													
Jan	dec-2	28.1	19.5	23.8	72	7.6	12.2	2.0	3.4	34	2.3	3.6	0.0	6.2	0.0	4.0	4.0	7.0	0.0	0.0	1.5	0.0	4.6
	dec-3	28.6	19.8	24.2	71	7.6	12.5	2.1	3.6	36													
	dec-4	29.3	20.2	24.7	71	7.7	12.9	2.4	3.8	38													
Feb	dec-5	29.6	20.4	25.0	71	7.7	13.3	2.5	4.0	40	8.4	1.7	0.0	56.8	0.0	0.0	0.0	8.0	59.7	0.0	0.0	0.0	0.0
	dec-6	30.3	20.8	25.6	70	7.7	13.6	2.5	4.2	42													
	dec-7	31.1	21.4	26.3	69	7.6	13.9	2.5	4.4	44													
Mar	dec-8	31.6	21.7	26.6	69	7.6	14.2	2.5	4.6	46	8.7	0.0	5.0	5.7	0.0	0.0	0.0	67.0	0.0	0.0	0.0	48.0	0.0
	dec-9	32.4	22.3	27.4	67	7.9	14.7	2.4	4.8	48													
	dec-10	33.5	23.1	28.3	64	8.3	15.2	2.1	5.0	50													
Apr	dec-11	34.0	23.6	28.8	63	8.5	15.4	2.0	5.1	51	2.9	16.1	0.0	0.0	0.0	2.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0
	dec-12	34.8	24.2	29.5	63	8.9	15.8	2.0	5.2	52													
	dec-13	35.7	25.2	30.4	63	9.4	16.2	2.0	5.4	54													
May	dec-14	36.2	25.6	30.9	63	9.6	16.3	1.9	5.5	55	9.4	4.1	0.0	0.0	0.0	0.0	0.0	16.5	8.5	19.7	0.0	0.0	0.0
	dec-15	36.7	26.1	31.4	63	9.1	15.7	1.9	5.4	54													
	dec-16	37.4	26.8	32.1	62	8.4	15.0	1.9	5.4	54													
Jun	dec-17	37.8	27.2	32.5	62	8.0	14.6	1.9	5.4	54	1.6	0.7	0.0	0.0	0.0	0.0	23.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	37.9	27.6	32.7	62	7.9	14.4	2.0	5.4	54													
	dec-19	38.1	28.1	33.1	63	7.7	14.3	2.1	5.5	55													
Jul	dec-20	38.2	28.4	33.3	63	7.6	14.3	2.2	5.6	56	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-21	38.2	28.2	33.2	63	7.7	14.4	2.2	5.6	56													
	dec-22	38.3	28.0	33.1	62	7.8	14.5	2.3	5.7	57													
Aug	dec-23	38.3	27.9	33.1	61	7.8	14.6	2.3	5.7	57	3.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-24	37.9	27.4	32.7	63	7.8	14.6	2.2	5.5	55													
	dec-25	37.4	26.8	32.1	66	7.8	14.5	2.1	5.3	53													
Sep	dec-26	37.2	26.5	31.8	67	7.8	14.4	2.0	5.1	51	8.8	0.0	0.0	15.0	0.0	0.0	0.0	41.5	0.0	3.0	54.0	0.0	0.0
	dec-27	36.1	25.3	30.7	67	8.1	14.5	2.0	5.0	50													
	dec-28	34.7	23.6	29.1	67	8.6	14.6	2.0	4.8	48													
Oct	dec-29	34.0	22.7	28.4	66	8.8	14.5	2.0	4.6	46	0.6	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	33.1	21.7	27.4	65	8.8	14.1	2.0	4.4	44													
	dec-31	31.8	20.2	26.0	64	8.7	13.6	1.9	4.1	41													
Nov	dec-32	31.1	19.5	25.3	63	8.7	13.3	1.9	3.9	39	1.2	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-33	30.5	19.6	25.1	65	8.6	12.9	2.0	3.8	38													
	dec-34	29.5	19.8	24.7	67	8.4	12.5	2.1	3.7	37													
Dec	dec-35	29.1	19.9	24.5	68	8.3	12.4	2.1	3.6	36	0.9	0.0	0.0	9.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-36	28.8	19.8	24.3	69	8.1	12.2	2.1	3.5	35													
Year		33.8	23.6	28.7	66	8.2	5079	2.1	4.7	1693	48	37	14	102	5	6	27	140	78	23	56	48	5
										P/PET	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

station: Hodeidah (agro-)meteorological
latitude: 14°45' average 1987-1988
longitude: 42°59'
altitude: 10 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)	
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	1987	1988
	dec-1	29.0	19.9	24.4	79	8.8	12.6	2.3	3.3	33	0.0	0.0
Jan	dec-2	28.7	19.8	24.3	79	8.6	12.6	2.5	3.3	33	0.0	0.0
	dec-3	28.9	20.2	24.6	79	8.6	13.0	2.6	3.5	35	0.0	0.0
	dec-4	29.2	20.6	24.9	79	8.7	13.5	2.9	3.7	37	0.0	0.0
Feb	dec-5	29.4	20.9	25.1	79	8.8	14.0	3.0	3.8	38	0.0	0.0
	dec-6	29.9	21.9	25.9	80	8.6	14.3	2.8	4.0	40	0.0	0.0
	dec-7	30.5	23.3	26.9	80	8.4	14.4	2.7	4.1	41	0.0	0.0
Mar	dec-8	30.8	23.9	27.4	80	8.3	14.7	2.6	4.2	42	0.0	0.0
	dec-9	31.7	24.4	28.1	79	8.7	15.3	2.6	4.5	45	0.0	0.0
	dec-10	33.0	25.1	29.0	77	9.3	16.0	2.6	4.9	49	32.3	0.0
Apr	dec-11	33.6	25.4	29.5	77	9.5	16.4	2.6	5.0	50	0.2	0.0
	dec-12	33.9	26.1	30.0	77	9.5	16.4	2.4	5.1	51	0.0	39.0
	dec-13	34.3	27.1	30.7	77	9.4	16.3	2.2	5.1	51	0.0	0.0
May	dec-14	34.5	27.5	31.0	77	9.4	16.2	2.2	5.1	51	0.0	0.0
	dec-15	35.1	28.0	31.6	77	8.6	15.4	2.1	5.0	50	2.0	0.0
	dec-16	36.0	28.7	32.3	76	7.7	14.5	2.1	4.9	49	0.0	0.0
Jun	dec-17	36.4	29.0	32.7	76	7.2	14.0	2.1	4.9	49	0.0	0.0
	dec-18	36.5	29.2	32.9	76	7.0	13.8	2.2	4.9	49	0.0	0.0
	dec-19	36.7	29.5	33.1	75	6.8	13.6	2.3	4.9	49	0.0	0.0
Jul	dec-20	36.8	29.7	33.2	75	6.7	13.5	2.3	4.9	49	0.0	0.0
	dec-21	36.6	29.4	33.0	76	6.9	13.7	2.2	4.9	49	0.0	23.3
	dec-22	36.4	29.0	32.7	76	7.1	14.0	2.1	4.8	48	2.0	61.4
Aug	dec-23	36.3	28.9	32.6	76	7.2	14.1	2.0	4.8	48	0.0	0.0
	dec-24	36.4	28.6	32.5	76	7.3	14.2	1.8	4.8	48	0.0	0.0
	dec-25	36.4	28.3	32.3	76	7.5	14.2	1.7	4.7	47	0.0	0.0
Sep	dec-26	36.4	28.1	32.3	76	7.6	14.1	1.6	4.6	46	0.0	27.5
	dec-27	35.7	27.2	31.4	75	8.3	14.5	1.7	4.6	46	0.0	0.0
	dec-28	34.7	25.9	30.3	74	9.3	15.0	1.9	4.6	46	0.0	0.0
Oct	dec-29	34.3	25.3	29.8	74	9.7	15.1	2.0	4.6	46	0.0	0.0
	dec-30	33.3	23.9	28.6	74	9.8	14.7	2.1	4.3	43	0.0	0.0
	dec-31	32.0	22.0	27.0	75	9.8	14.2	2.2	4.0	40	1.9	0.0
Nov	dec-32	31.4	21.1	26.2	75	9.8	13.9	2.2	3.9	39	0.0	0.0
	dec-33	30.8	20.7	25.7	77	9.6	13.4	2.2	3.6	36	0.0	0.0
	dec-34	30.0	20.2	25.1	79	9.4	13.0	2.1	3.4	34	0.0	0.0
Dec	dec-35	29.6	19.9	24.8	80	9.3	12.8	2.0	3.2	32	0.0	0.0
	dec-36	29.3	19.9	24.6	79	9.1	12.7	2.2	3.2	32	0.0	0.0
Year		33.2	25.0	29.1	77	8.5	5141	2.2	4.4	1571	38	151
										P/PET	0.0	0.1

station: Mokha rainfall
latitude: 13°18' average 1987-1988
longitude: 43°16'
altitude: 5 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)	
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	1987	1988
	dec-1	28.9	21.5	25.2	71	9.2	13.2	2.3	3.7	37	0.0	0.0
Jan	dec-2	28.6	21.4	25.0	71	9.4	13.6	2.5	3.9	39	0.0	0.0
	dec-3	28.7	21.5	25.1	72	9.4	13.9	2.6	4.0	40	0.0	0.0
	dec-4	28.9	21.6	25.2	73	9.3	14.3	2.9	4.1	41	0.0	0.0
Feb	dec-5	29.0	21.6	25.3	73	9.3	14.7	3.0	4.2	42	0.0	0.0
	dec-6	29.5	22.2	25.8	74	8.7	14.5	2.8	4.3	43	0.0	0.0
	dec-7	30.2	22.9	26.5	74	7.8	14.0	2.7	4.3	43	0.0	0.0
Mar	dec-8	30.6	23.2	26.9	74	7.4	13.9	2.6	4.3	43	0.0	0.0
	dec-9	31.2	23.9	27.5	74	8.1	14.9	2.6	4.6	46	1.8	0.0
	dec-10	32.1	24.7	28.4	73	9.1	16.0	2.6	4.9	49	29.7	0.0
Apr	dec-11	32.5	25.1	28.8	73	9.6	16.5	2.6	5.1	51	0.0	0.0
	dec-12	33.2	25.8	29.5	73	9.7	16.6	2.4	5.2	52	0.0	0.0
	dec-13	34.2	26.7	30.4	73	9.8	16.6	2.2	5.3	53	0.0	0.0
May	dec-14	34.6	27.2	30.9	73	9.9	16.6	2.2	5.3	53	27.0	3.1
	dec-15	34.8	27.7	31.3	74	9.0	15.7	2.1	5.1	51	0.0	0.0
	dec-16	35.0	28.5	31.7	75	7.8	14.5	2.1	4.8	48	0.0	0.0
Jun	dec-17	35.1	28.9	32.0	76	7.2	13.9	2.1	4.7	47	0.0	0.0
	dec-18	35.1	28.9	32.0	76	7.1	13.8	2.2	4.7	47	0.0	0.0
	dec-19	35.1	29.0	32.0	77	7.0	13.7	2.3	4.7	47	0.0	0.0
Jul	dec-20	35.2	29.0	32.1	77	6.9	13.6	2.3	4.7	47	0.0	0.0
	dec-21	35.2	29.0	32.1	77	6.9	13.7	2.2	4.7	47	0.0	20.9
	dec-22	35.2	29.0	32.1	78	6.9	13.7	2.1	4.6	46	0.0	1.9
Aug	dec-23	35.2	29.0	32.1	78	6.9	13.8	2.0	4.6	46	0.0	0.0
	dec-24	35.2	28.7	31.9	77	7.2	14.0	1.8	4.6	46	0.0	0.0
	dec-25	35.2	28.3	31.7	75	7.6	14.3	1.7	4.6	46	0.0	0.0
Sep	dec-26	35.1	28.0	31.6	75	7.8	14.4	1.6	4.6	46	0.0	0.0
	dec-27	34.5	26.9	30.7	73	8.5	14.8	1.7	4.6	46	0.0	0.0
	dec-28	33.7	25.3	29.5	70	9.4	15.4	1.9	4.7	47	4.8	0.0
Oct	dec-29	33.3	24.5	28.9	69	9.9	15.4	2.0	4.7	47	0.0	0.0
	dec-30	32.6	24.0	28.3	69	9.9	15.0	2.1	4.5	45	0.0	0.0
	dec-31	31.6	23.4	27.5	68	10.0	14.6	2.2	4.4	44	0.0	0.0
Nov	dec-32	31.2	23.0	27.1	68	10.0	14.3	2.2	4.2	42	0.0	0.0
	dec-33	30.6	22.6	26.6	69	9.6	13.6	2.2	4.0	40	0.0	0.0
	dec-34	29.9	22.0	25.9	71	9.0	13.0	2.1	3.7	37	0.0	0.0
Dec	dec-35	29.5	21.7	25.6	72	8.7	12.6	2.0	3.6	36	0.0	0.0
	dec-36	29.2	21.6	25.4	71	8.9	12.8	2.2	3.6	36	0.0	0.0
Year		32.5	25.2	28.9	73	8.6	5199	2.2	4.5	1616	63	26
										P/PET	0.0	0.0

station: Al Jowf (agro-)meteorological
latitude: 16°15' average 1987-1991
longitude: 44°47'
altitude: 1100 m

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)					
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1987	1988	1989	1990	1991
	dec-1	27.6	11.1	19.3	29	10.1	14.3	1.4	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0
Jan	dec-2	27.6	10.9	19.3	31	10.1	14.6	1.5	3.7	37	1.6	0.0	8.0	0.0	0.0	0.0
	dec-3	28.6	12.0	20.3	31	9.9	14.9	1.6	4.0	40	1.4	0.0	0.0	7.0	0.0	0.0
	dec-4	29.9	13.5	21.7	31	9.7	15.3	1.8	4.5	45	2.2	0.0	0.0	0.0	11.0	0.0
Feb	dec-5	30.6	14.2	22.4	31	9.6	15.7	1.9	4.8	48	5.6	0.0	26.0	0.0	2.0	0.0
	dec-6	31.7	15.5	23.6	31	9.5	16.2	1.9	5.1	51	1.4	2.0	5.0	0.0	0.0	0.0
	dec-7	33.2	17.3	25.2	31	9.3	16.6	1.9	5.4	54	1.8	8.0	0.0	0.0	1.0	0.0
Mar	dec-8	33.9	18.2	26.1	32	9.3	17.0	1.8	5.6	56	2.6	0.0	6.0	3.0	0.0	4.0
	dec-9	34.0	18.3	26.2	33	9.2	17.3	1.8	5.7	57	3.0	5.0	0.0	2.0	0.0	8.0
	dec-10	34.1	18.5	26.3	36	9.1	17.5	1.7	5.7	57	7.8	14.0	0.0	18.0	7.0	0.0
Apr	dec-11	34.2	18.6	26.4	37	9.0	17.6	1.7	5.7	57	3.0	0.0	10.0	3.0	2.0	0.0
	dec-12	35.5	19.5	27.5	31	9.3	17.9	1.7	6.0	60	5.2	0.0	9.0	10.0	7.0	0.0
	dec-13	37.3	20.8	29.0	22	9.7	18.3	1.7	6.3	63	2.8	7.0	0.0	0.0	0.0	7.0
May	dec-14	38.2	21.4	29.8	18	10.0	18.4	1.7	6.4	64	0.0	0.0	0.0	0.0	0.0	0.0
	dec-15	38.8	22.0	30.4	17	10.0	18.4	1.8	6.6	66	0.8	0.0	0.0	3.0	0.0	1.0
	dec-16	39.5	22.8	31.2	17	10.0	18.3	1.9	6.8	68	1.4	0.0	0.0	7.0	0.0	0.0
Jun	dec-17	39.9	23.2	31.6	17	10.0	18.3	1.9	6.9	69	0.0	0.0	0.0	0.0	0.0	0.0
	dec-18	40.2	23.9	32.0	17	9.1	17.6	2.1	7.2	72	0.8	2.0	0.0	0.0	0.0	2.0
	dec-19	40.6	24.8	32.7	18	8.0	16.8	2.4	7.6	76	3.4	0.0	0.0	0.0	0.0	17.0
Jul	dec-20	40.8	25.2	33.0	18	7.5	16.4	2.5	7.8	78	1.2	0.0	2.0	4.0	0.0	0.0
	dec-21	40.7	25.1	32.9	19	7.4	16.3	2.4	7.6	76	4.6	0.0	21.0	0.0	2.0	0.0
	dec-22	40.5	25.0	32.7	20	7.2	16.2	2.2	7.3	73	1.2	0.0	0.0	0.0	0.0	6.0
Aug	dec-23	40.4	24.9	32.7	21	7.2	16.1	2.2	7.2	72	0.4	2.0	0.0	0.0	0.0	0.0
	dec-24	39.6	23.8	31.7	18	7.8	16.4	2.0	6.9	69	1.0	0.0	5.0	0.0	0.0	0.0
	dec-25	38.6	22.3	30.5	15	8.6	16.9	1.9	6.4	64	0.0	0.0	0.0	0.0	0.0	0.0
Sep	dec-26	38.1	21.6	29.9	14	9.0	16.9	1.8	6.1	61	1.2	0.0	0.0	0.0	0.0	6.0
	dec-27	36.6	20.1	28.4	14	9.4	16.9	1.7	5.8	58	2.0	0.0	3.0	0.0	7.0	0.0
	dec-28	34.7	18.2	26.4	13	10.1	16.9	1.6	5.3	53	0.0	0.0	0.0	0.0	0.0	0.0
Oct	dec-29	33.7	17.2	25.5	13	10.4	16.7	1.6	5.0	50	0.0	0.0	0.0	0.0	0.0	0.0
	dec-30	32.4	15.6	24.0	14	10.5	16.2	1.5	4.6	46	1.4	0.0	0.0	7.0	0.0	0.0
	dec-31	30.6	13.4	22.0	15	10.5	15.6	1.4	4.1	41	0.0	0.0	0.0	0.0	0.0	0.0
Nov	dec-32	29.7	12.3	21.0	16	10.6	15.2	1.3	3.8	38	0.6	0.0	0.0	3.0	0.0	0.0
	dec-33	29.0	12.0	20.5	19	10.4	14.7	1.3	3.6	36	0.0	0.0	0.0	0.0	0.0	0.0
	dec-34	28.0	11.7	19.8	24	10.3	14.4	1.3	3.5	35	0.8	0.0	4.0	0.0	0.0	0.0
Dec	dec-35	27.5	11.5	19.5	26	10.2	14.2	1.3	3.4	34	2.6	0.0	0.0	13.0	0.0	0.0
	dec-36	27.5	11.3	19.4	28	10.2	14.2	1.4	3.5	35	4.0	20.0	0.0	0.0	0.0	0.0
Year		34.5	18.3	26.4	23	9.4	5910	1.8	5.5	1993	66	60	99	80	39	51
										P/PET	0.0	0.0	0.0	0.0	0.0	0.0

station: Socotra (agro-)meteorological
latitude: 12°38' average 1978, 1980-1982, 1986-1989
longitude: 54°03'
altitude:

		Temperature (°C)			RH	sun	radiation	winds	PET		rainfall (mm)								
		max	min	mean	%	h/d	MJ/m²/d	m/s	mm/d	mm/dec	average	1978	1980	1981	1982	1986	1987	1988	1989
	dec-1	28.7	23.5	26.1	65	7.0	11.5	1.5	3.4	34									
Jan	dec-2	28.8	23.1	26.0	64	6.7	11.5	1.6	3.5	35	1.7	0.0	0.0	0.0	1.2	0.0	0.0	0.0	12.3
	dec-3	28.8	22.5	25.7	64	7.2	12.2	1.6	3.6	36									
	dec-4	28.9	21.8	25.3	63	7.9	13.1	1.6	3.8	38									
Feb	dec-5	28.9	21.4	25.2	63	8.2	13.8	1.6	3.9	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-6	30.0	21.6	25.8	63	8.3	14.2	1.6	4.1	41									
	dec-7	31.4	21.9	26.7	64	8.4	14.6	1.5	4.3	43									
Mar	dec-8	32.2	22.1	27.1	64	8.4	14.9	1.5	4.4	44	9.8	0.0	0.0	58.2	0.0	0.0	0.0	0.0	20.4
	dec-9	32.2	23.0	27.6	64	8.5	15.3	1.4	4.5	45									
	dec-10	32.3	24.3	28.3	64	8.7	15.6	1.2	4.5	45									
Apr	dec-11	32.4	25.0	28.7	63	8.8	15.7	1.1	4.5	45	4.5	0.0	0.0	35.8	0.0	0.0	0.0	0.0	0.0
	dec-12	33.1	25.7	29.4	63	8.5	15.4	1.2	4.6	46									
	dec-13	34.0	26.7	30.3	63	8.0	14.9	1.4	4.7	47									
May	dec-14	34.4	27.2	30.8	63	7.8	14.6	1.5	4.8	48	16.3	0.0	0.0	12.6	60.1	0.0	57.5	0.0	0.0
	dec-15	35.2	28.2	31.7	60	7.8	14.5	2.0	5.4	54									
	dec-16	36.3	29.6	32.9	56	7.7	14.4	2.8	6.2	62									
Jun	dec-17	36.8	30.3	33.6	54	7.7	14.3	3.2	6.7	67	6.0	0.0	0.0	0.0	0.0	48.0	0.0	0.0	0.0
	dec-18	36.2	29.7	32.9	51	8.2	14.8	3.3	6.9	69									
	dec-19	35.4	28.8	32.1	47	8.9	15.4	3.6	7.3	73									
Jul	dec-20	35.0	28.4	31.7	46	9.3	15.8	3.7	7.5	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-21	35.2	28.2	31.7	46	8.6	15.2	3.4	7.2	72									
	dec-22	35.6	28.1	31.8	45	7.7	14.4	3.0	6.7	67									
Aug	dec-23	35.7	28.0	31.9	45	7.2	14.0	2.8	6.5	65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	dec-24	34.9	27.3	31.1	51	8.1	14.9	2.5	6.0	60									
	dec-25	33.9	26.3	30.1	59	9.2	15.9	2.1	5.4	54									
Sep	dec-26	33.3	25.9	29.6	63	9.8	16.3	1.9	5.1	51	6.3	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0
	dec-27	32.3	25.0	28.6	66	9.8	16.1	1.6	4.8	48									
	dec-28	30.8	23.8	27.3	70	9.8	15.8	1.4	4.3	43									
Oct	dec-29	30.1	23.3	26.7	72	9.8	15.4	1.2	4.0	40	31.2	0.0	56.9	165.0	6.2	13.1	0.0	8.5	0.0
	dec-30	29.9	23.6	26.7	71	9.5	14.8	1.3	3.9	39									
	dec-31	29.5	24.0	26.7	69	9.1	14.0	1.4	3.8	38									
Nov	dec-32	29.4	24.2	26.8	68	8.9	13.5	1.5	3.7	37	19.6	13.0	0.0	8.2	115.7	7.5	0.0	12.6	0.0
	dec-33	29.1	24.2	26.6	68	8.5	12.9	1.4	3.6	36									
	dec-34	28.7	24.3	26.5	67	8.0	12.3	1.3	3.4	34									
Dec	dec-35	28.5	24.3	26.4	67	7.7	12.0	1.3	3.3	33	7.8	2.0	0.0	9.8	0.0	38.3	0.0	12.3	0.0
	dec-36	28.6	23.9	26.3	66	7.4	11.7	1.4	3.3	33									
Year		32.1	25.3	28.7	61	8.4	5154	1.9	4.8	1739	103	15	57	290	233	107	58	33	33
										P/PET	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0

Annex II

Summary tables

Table A-II.1: Agro-climatic zones in Yemen[1]

LGP zone	area '000ha	percentage of total country	Temp zone	area '000ha	percentage of LGP zone
1	12	<0.5			
			4	2	16
			5	9	78
			6	1	5
2a	121	<0.5			
			4	9	7
			5	57	47
			6	50	41
			7	5	4
2b	52	<0.5			
			4	2	4
			5	20	39
			6	28	54
			7	2	4
2c	51	<0.5			
			6	42	82
			7	9	18
3a	560	1			
			2	5	1
			3	78	14
			4	234	42
			5	203	36
			6	31	6
			7	10	2

[1]

zone	altitude
1	0 - 200
2	200 - 400
3	400 - 1000
4	1000 - 1600
5	1600 - 2200
6	2200 - 2800
7	> 2800

LGP zone	area '000ha	percentage of total country	Temp zone	area '000ha	percentage of LGP zone
3b	683	2			
			2	5	1
			3	124	18
			4	229	33
			5	207	30
			6	97	14
			7	21	3
4	215	1			
			3	2	1
			4	203	95
			5	9	4
5a	2024	5			
			2	51	3
			3	534	26
			4	508	25
			5	478	24
			6	443	22
			7	10	<0.5
5b	893	2			
			1	1	<0.5
			2	77	9
			3	210	24
			4	295	33
			5	223	25
			6	87	10
6a	67	<0.5			
			5	<0.5	<0.5
			6	66	100

LGP zone	area '000ha	percentage of total country	Temp zone	area '000ha	percentage of LGP zone
6b	63	<0.5			
			5	2	4
			6	58	92
			7	3	5
7a	204	<0.5			
			5	65	32
			6	139	68
7b	237	1			
			5	57	24
			6	176	74
			7	4	2
7c	63	<0.5			
			5	63	100
8	530	1			
			1	273	51
			2	213	40
			3	42	8
			4	1	<0.5
9	481	1			
			1	416	86
			2	65	14
10a	174	<0.5			
			3	166	95
			4	8	5
10b	478	1			
			3	70	15
			4	199	42
			5	209	44

LGP zone	area '000ha	percentage of total country	Temp zone	area '000ha	percentage of LGP zone
10c	706	2			
			1	11	2
			2	31	4
			3	347	49
			4	235	33
			5	81	12
11	18610	45			
			1	213	1
			2	562	3
			3	8549	46
			4	6629	36
			5	2497	13
			6	159	1
12	3957	10			
			1	2628	66
			2	857	22
			3	472	12
13	10795	26			
			3	8525	79
			4	2270	21
14	369	1			
			1	84	23
			2	206	56
			3	78	21

Table A-II.2: Agro-climatic zones in governorates

a ABYAN

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Abyan	1897						
		10a	116	6			
					3	110	6
					4	7	<0.5
		10b	435	23			
					3	66	3
					4	191	10
					5	177	9
		10c	298	16			
					1	11	1
					2	30	2
					3	173	9
					4	74	4
					5	10	1
		11	449	24			
					1	14	1
					2	17	1
					3	179	9
					4	73	4
					5	166	9
		12	599	32			
					1	324	17
					2	141	7
					3	135	7

b ADEN

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Aden	94						
		12	94	100			
					1	94	100

Table A-II.2: Agro-climatic zones in governorates (cont'd)

c AL BAYDA

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Al Bayda	1005						
		5a	30	3			
					5	7	1
					6	23	2
		7a	76	8			
					5	64	6
					6	11	1
		10b	31	3			
					5	31	3
		10c	22	2			
					4	1	<0.5
					5	21	2
		11	845	84			
					4	187	19
					5	658	65

d AL JOWF

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Al Jowf	3348						
		11	726	22			
					4	626	19
					5	100	3
		13	2622	78			
					3	1675	50
					4	946	28

Table A-II.2: Agro-climatic zones in governorates (cont'd)

e AL MAHRA

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Al Mahra	10166						
		11	6747	66			
					1	102	1
					2	347	3
					3	5371	53
					4	927	9
		12	944	9			
					1	583	6
					2	258	3
					3	104	1
		13	2474	24			
					3	2474	24

f HADRAMAUT

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Hadramaut	8731						
		11	5481	63			
						71	1
						147	2
						2339	27
						2743	31
						181	2
		12	391	4			
						275	3
						88	1
						27	<0.5
		13	2859	33			
						2622	30
						238	3

Table A-II.2: Agro-climatic zones in governorates (cont'd)
g DHAMAR

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Dhamar	796						
		2a	1	<0.5			
					6	1	<0.5
		3a	90	11			
					3	1	<0.5
					4	23	3
					5	62	8
					6	4	1
		3b	155	19			
					3	33	4
					4	50	6
					5	36	5
					6	36	4
		5a	142	18			
					2	1	<0.5
					3	13	2
					4	28	4
					5	52	7
					6	46	6
					7	2	<0.5
		5b	67	8			
					2	2	<0.5
					3	7	1
					4	42	5
					5	9	1
					6	7	1
		6a	66	8			
					6	66	8
		7a	127	16			
					6	127	16
		11	148	19			
					5	89	11
					6	60	7

Table A-II.2: Agro-climatic zones in governorates (cont'd)
h HAJJA

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Hajja	1038						
		3a	142	14			
					3	45	4
					4	75	7
					5	22	2
		3b	13	1			
					3	12	1
					4	1	<0.5
		5a	165	16			
					3	42	4
					4	111	11
					5	12	1
		5b	333	32			
					2	54	5
					3	111	11
					4	141	14
					5	27	3
		8	188	18			
					1	115	11
					2	65	6
					3	8	1
		9	87	8			
					1	87	8
		11	1	<0.5			
					5	1	<0.5
		12	109	11			
					1	109	11

Table A-II.2: Agro-climatic zones in governorates (cont'd)
i HODEIDAH

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Hodeidah	1313						
		3a	31	2			
					2	5	<0.5
					3	17	1
					4	8	1
					5	1	<0.5
		3b	14	1			
					2	5	<0.5
					3	9	1
		5a	55	4			
					2	18	1
					3	35	3
					4	2	<0.5
		5b	56	4			
					2	17	1
					3	40	3
		8	303	23			
					1	157	12
					2	135	10
					3	11	1
		9	329	25			
					1	315	24
					2	14	1
		12	525	40			
					1	525	40

Table A-II.2: Agro-climatic zones in governorates (cont'd)

j IBB

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Ibb	663						
		1	12	2			
					4	2	<0.5
					5	9	1
					6	1	<0.5
		2a	120	18			
					4	8	1
					5	57	9
					6	49	7
					7	5	1
		2b	52	8			
					4	2	<0.5
					5	20	3
					6	28	4
					7	2	<0.5
		2c	51	8			
					6	42	6
					7	9	1
		3b	130	20			
					3	1	<0.5
					4	48	7
					5	71	11
					6	10	2
		4	40	6			
					4	38	6
					5	2	<0.5
		5a	189	28			
					3	21	3
					4	38	6
					5	72	11
					6	57	9

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Ibb	663						
		5b	51	8			
					3	5	1
					4	43	7
					5	3	<0.5
		10c	18	3			
					4	1	<0.5
					5	17	3
		11	1	<0.5			
					5	1	<0.5

k LAHEJ

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Lahej	1114						
		4	21	2			
					4	21	2
		5a	102	9			
					2	14	1
					3	88	8
		10a	57	5			
					3	56	5
					4	2	<0.5
		10c	299	27			
					2	1	<0.5
					3	155	14
					4	117	11
					5	26	2
		12	635	57			
					1	306	27
					2	236	21
					3	92	8

Table A-II.2: Agro-climatic zones in governorates (cont'd)

l MAHWEET

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Mahweet	219						
		3a	1	<0.5			
					6	1	<0.5
		3b	200	91			
					3	64	29
					4	78	35
					5	37	17
					6	14	6
					7	8	4
		5a	13	6			
					3	4	2
					4	6	3
					5	1	1
					6	2	1
		5b	3	1			
					3	2	1
					4	1	<0.5
		8	2	1			
					3	2	1

m SOCOTRA

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Socotra	369						
		14	369	100			
					1	84	23
					2	206	56
					3	78	21

Table A-II.2: Agro-climatic zones in governorates (cont'd)

n MARIB

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Marib	1525						
		5a	31	2			
					4	7	<0.5
					5	19	1
					6	6	<0.5
		5b	22	1			
					4	18	1
					5	4	<0.5
		11	700	46			
					4	453	30
					5	247	16
		13	771	51			
					3	340	22
					4	431	28

o SANA'A

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Sana'a	2337						
		3a	227	10			
					3	15	1
					4	95	4
					5	81	3
					6	25	1
					7	10	<0.5

Governorate	total area '000 ha	LGP zone	area '000ha	percentage of governorate	Temp zone	area '000ha	percentage of governorate
Sana'a	2337						
		3b	77	3			
					3	1	<0.5
					4	21	1
					5	16	1
					6	24	1
					7	13	1
		5a	471	20			
					3	36	2
					4	95	4
					5	106	5
					6	226	10
					7	8	<0.5
		5b	308	13			
					3	15	1
					4	49	2
					5	164	7
					6	80	3
		6b	63	3			
					5	2	<0.5
					6	58	2
					7	3	<0.5
		7b	237	10			
					5	57	2
					6	176	8
					7	4	<0.5
		11	955	41			
					4	262	11
					5	600	26
					6	93	4

Table A-II.4: Growing period zone characteristics (2)

Zone	without water harvesting			with water harvesting		
	LGP (days)	water (mm)	P/PET	LGP (days)	water (mm)	P/PET
1	240	800	1	270	>1000	>1
2a	180	700	0.75	240	>1000	>1
2b	190	700	0.75	240	>1000	>1
2c	170	600	0.85	240	900	1
3a	90	250	0.5	230	1000	1
	60	250	0.8			
3b	70	130	0.5	200	1000	1
	50	200	0.9			
4	80	160	0.4	100	400	0.9
	70	175	0.5	110	500	1
5a	60	100	0.35	80	300	0.8
	1/ 30	50	0.35	60	150	0.8
5b	30	50	0.35	50	150	0.8
	50	250	0.6	80	500	>1
6a	60	135	0.5	90	270	0.8
	40	120	0.65	60	250	0.9
6b	30	70	0.4	50	150	0.8
	40	150	0.7	70	300	0.9
7a	40	80	0.45	50	150	0.8
	2/ 30	70	0.45	50	150	0.8
7b	30	45	0.3	40	100	0.5
	3/ 20	50	0.45	50	100	0.7
7c	20	50	0.5	40	100	0.5
	4/ 20	50	0.5	40	100	0.7
8	2/ 20	50	0.4	30	80	0.6
	70	200	0.6	80	300	0.75
9	4/ 20	40	0.4	30	60	0.5
	50	120	0.4	60	200	0.65
10a	3/ 30	100	0.6	40	150	0.7
	1/ 90	200	0.4	100	300	0.6
10b	2/ 90	200	0.5	100	300	0.75
10c	3/ 90	150	0.3	100	250	0.5
14	2/ 30	75	0.6	40	130	0.75
	3/ 40	100	0.6	50	160	0.75

Table A-II.5: Temperature zone characteristics

Temp zone	altitude	GP zone	annual	during GP	during cold season			during hot season	
			T mean	T mean	T mean	T min	frost days	T mean	T max
1	0-200	1-13	27.5-30	30-32.5	25-27.5	20-22.5	0	30-32.5	35-37.5
		14	27.5-30	27.5-30	25-27.5	22.5-25	0	30-32.5	32.5-35
2	200-400	1-13	27.5-30	30-32.5	25-27.5	20-22.5	0	30-32.5	37.5-40
		14	27.5-30	27.5-30	25-27.5	22.5-25	0	30-32.5	32.5-35
3	400-1000	3, 5	25-27.5	27.5-30	22.5-25	15-17.5	0	25-27.5	35-37.5
		8, 12	25-27.5	30-32.5	22.5-25	17.5-20	0	27.5-30	35-37.5
		4, 10	25-27.5	27.5-30	22.5-25	15-17.5	0	27.5-30	32.5-35
		11, 13	27.5-30	-	20-22.5	12.5-15	0	30-32.5	37.5-40
		14	25-27.5	27.5-30	22.5-25	22.5-25	0	27.5-30	30-32.5
4	1000-1600	1	20-22.5	20-22.5	17.5-20	10-12.5	0	22.5-25	30-32.5
		2	22.5-25	22.5-25	20-22.5	10-12.5	0	25-27.5	30-32.5
		4, 8, 10	22.5-25	25-27.5	20-22.5	12.5-15	0	25-27.5	30-32.5
		3, 5	22.5-25	25-27.5	20-22.5	12.5-15	0	25-27.5	32.5-35
		11, 13	25-27.5	-	20-22.5	12.5-15	0	27.5-30	35-37.5
5	1600-2200	1,2	17.5-22.5	17.5-20	15-17.5	7.5-10	< 10	20-22.5	27.5-30
		3, 5	20-22.5	22.5-25	17.5-20	7.5-10	< 10	22.5-25	30-32.5
		4, 10	20-22.5	22.5-25	17.5-20	7.5-12.5	< 10	22.5-25	27.5-30
		11	22.5-25	-	17.5-20	7.5-12.5	< 10	25-27.5	32.5-35
		6, 7	17.5-20	20-22.5	15-17.5	5-7.5	< 10	20-22.5	27.5-30
6	2200-2800	1, 2	12.5-17.5	15-17.5	10-15	2.5-7.5	45-60	17.5-20	25-27.5
		3, 5	15-20	20-22.5	12.5-17.5	5-7.5	45-60	20-22.5	27.5-30
		6, 7	12.5-17.5	17.5-20	10-15	2.5-5	45-60	17.5-20	25-27.5
7	> 2800	2	< 12.5	< 15	< 10	< 2.5	> 60	< 17.5	< 25
		3, 5	< 15	< 20	< 12.5	< 5	> 60	< 20	< 27.5
		6, 7	< 12.5	< 17.5	< 10	< 2.5	> 60	< 17.5	< 25

Table A-II.6: Soil temperature regimes

Zone	altitude	Soil temperature regime
1	>1800	Isothermic
	<1800	Isohyperthermic
2	>1800	Isothermic
	<1800	Isohyperthemic
3	>2300	Thermic
	<2300	Isohyperthemic
4	>1800	Isothermic
	<1800	Isohyperthermic
5	>2300	Thermic
	1800-2300	Hyperthermic
	<1800	Isohyperthermic
6		Thermic
7		Hyperthermic
8		Hyperthermic
9		Hyperthermic
10	>1800	Thermic
	<1800	Hyperthermic
11		Hyperthermic
12		Hyperthermic
13		Hyperthermic
14		Hyperthermic

Table A-II.7: Soil moisture regimes

Zone	without water harvesting		with water harvesting	
	Soil Taxonomy (1994)	v. Wambeke (1992)	Soil Taxonomy (1994)	v. Wambeke (1992)
1	ustic	typic tropo-ustic	ustic	udic tropo-ustic
2a	ustic	typic tropo-ustic	ustic	udic tropo-ustic
2b	ustic	typic tropo/temp-ustic	ustic	udic tropo/temp-ustic
2c	ustic	typic temp-ustic	ustic	udic temp-ustic
3a	ustic	aridic tropo/temp-ustic	ustic	typic tropo/temp-ustic
3b	aridic	weak aridic	ustic	typic tropo/temp-ustic
4	aridic	aridic tropo-ustic typic aridic	ustic	aridic tropo-ustic
5a	aridic	weak aridic	aridic ustic	aridic tropo/temp-ustic
5b	aridic	typic aridic	aridic	weak aridic
6a	aridic	weak aridic	aridic ustic	weak aridic aridic temp-ustic
6b	aridic	weak aridic	aridic	weak aridic
7a	aridic	typic aridic	aridic	weak aridic
7b	aridic	typic aridic	aridic	weak aridic
7c	aridic	typic aridic	aridic	typic aridic
8	aridic	weak aridic	aridic	weak aridic
9	aridic	weak / typic aridic	aridic	weak aridic
10	aridic	weak aridic		
11	aridic	typic aridic		
12	aridic	typic aridic		
13	aridic	extreme aridic		
14	aridic	typic aridic	aridic	typic aridic