

An aerial photograph of a mountainous region in Yemen, showing extensive terraced agriculture. The terraces are built into the steep slopes of the hills, creating a series of flat, rectangular plots. The fields are filled with green crops, likely coffee or wheat, and are separated by low stone walls. In the upper left, a small cluster of buildings is visible. The overall scene is a testament to traditional agricultural practices in a mountainous, semi-arid environment.

Yemen

A History of Food Production

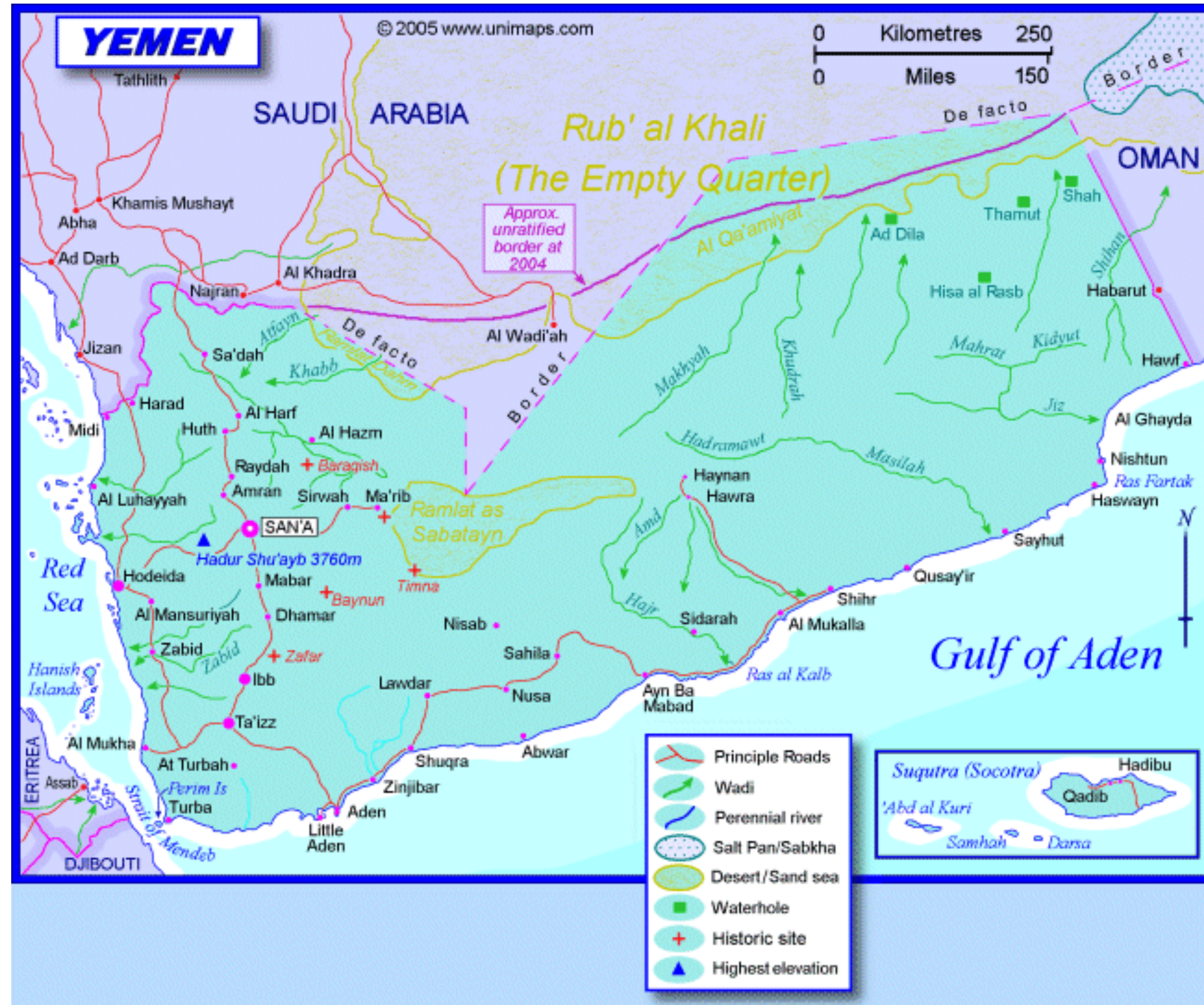
A Visual Tour

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This is a self-guided
tour through the
history of traditional
agriculture in Yemen
from the early South
Arabian kingdoms to
the present.

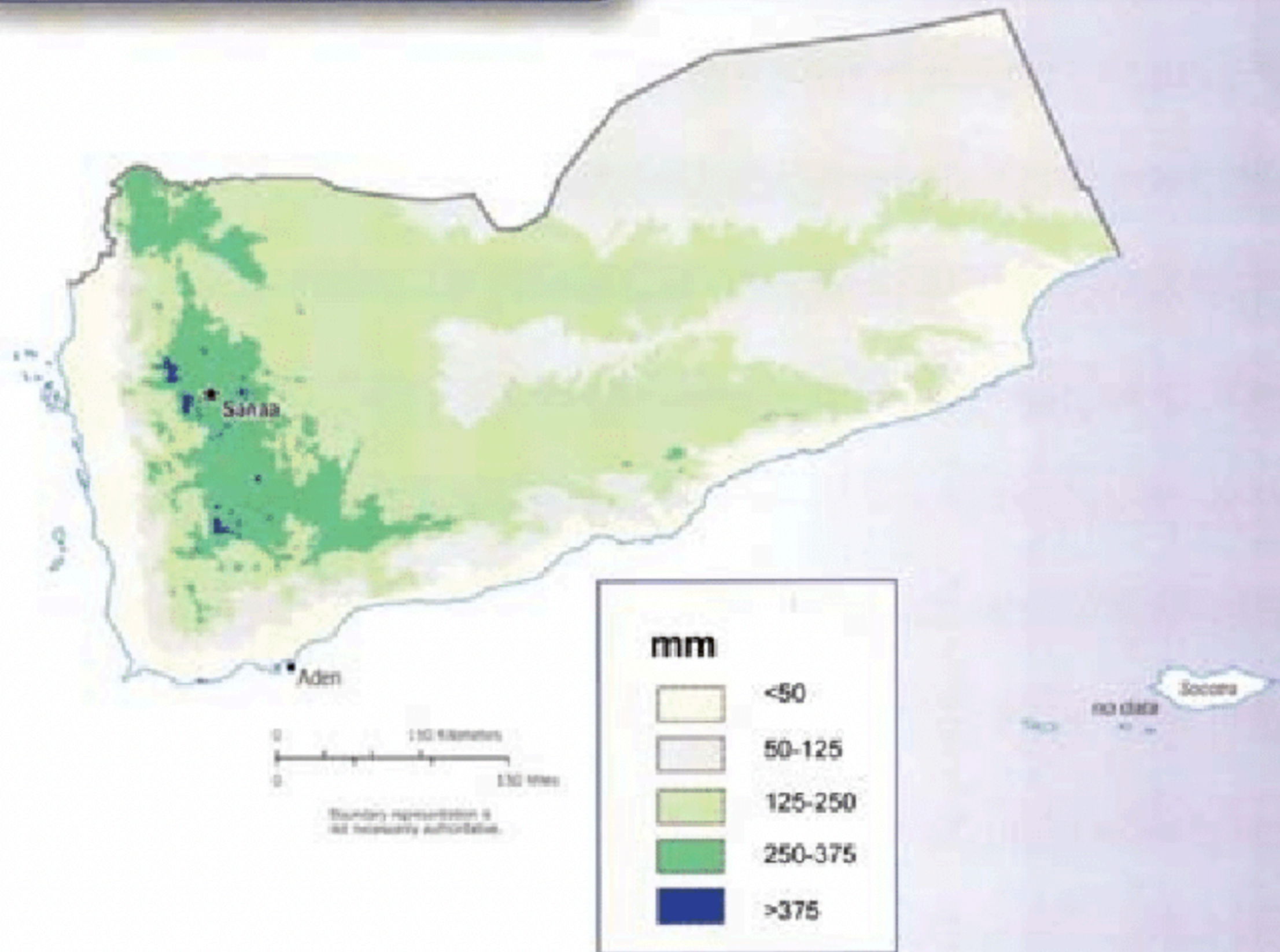


The spring-irrigated valley of al-Ahjur,
where I conducted ethnographic research in 1978-79.



Yemen at the southwestern corner of the Arabian Peninsula with the Red Sea on the left and Gulf of Aden on the right

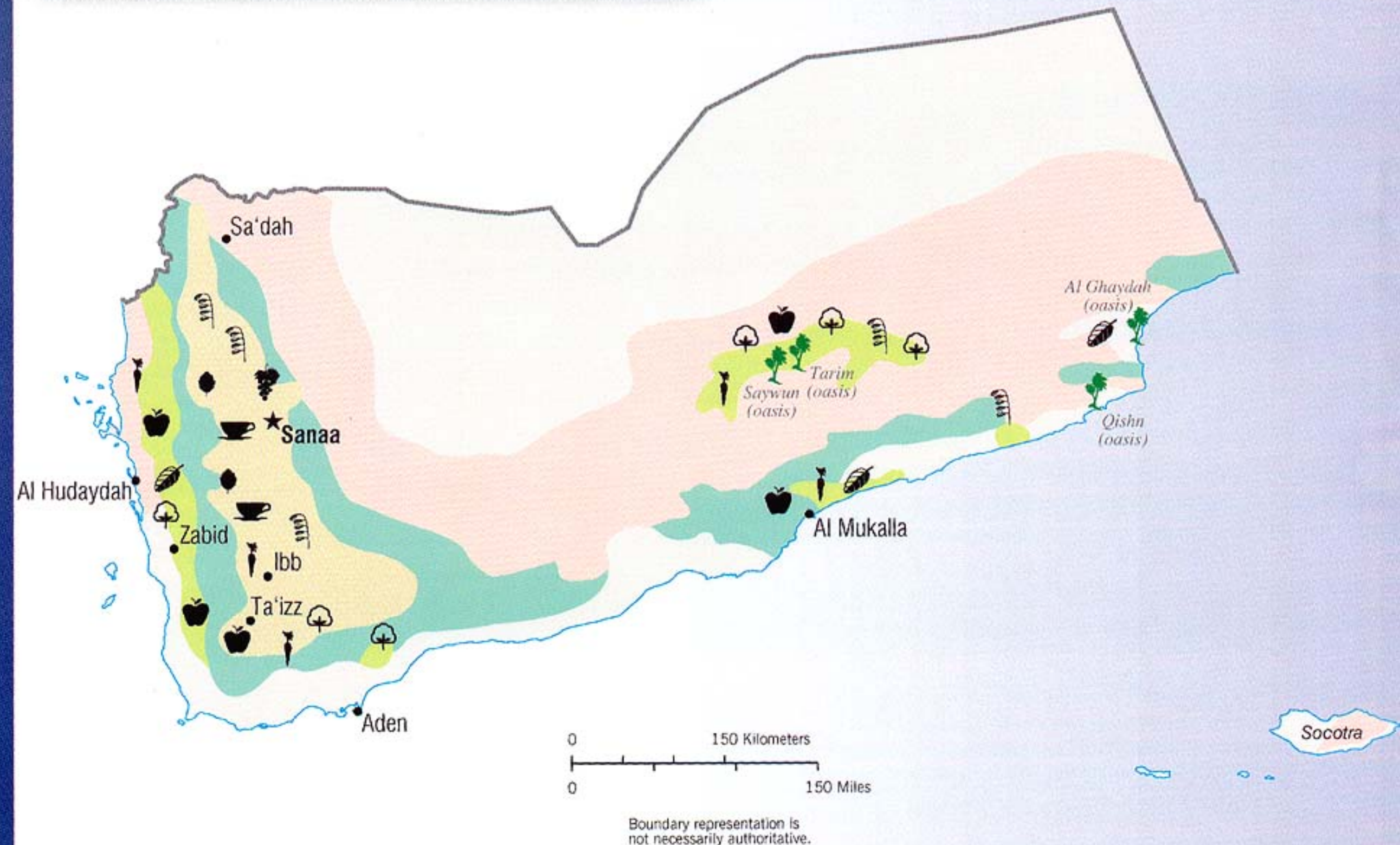
Annual Rainfall



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Yemen has a variety of ecological zones, including the highest point on the peninsula. The most productive land is in the western part, especially the southern and central highlands.

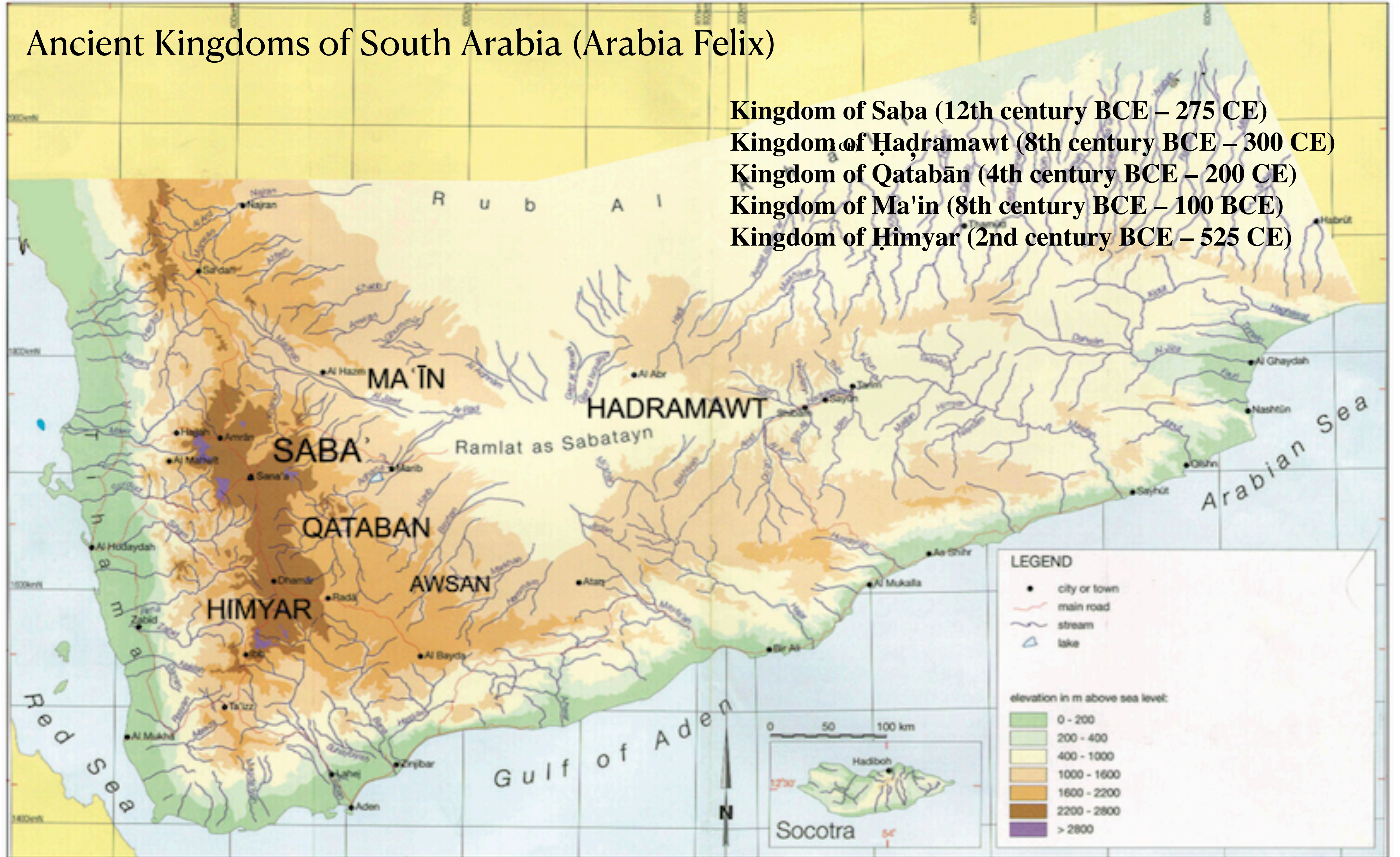
Land Use

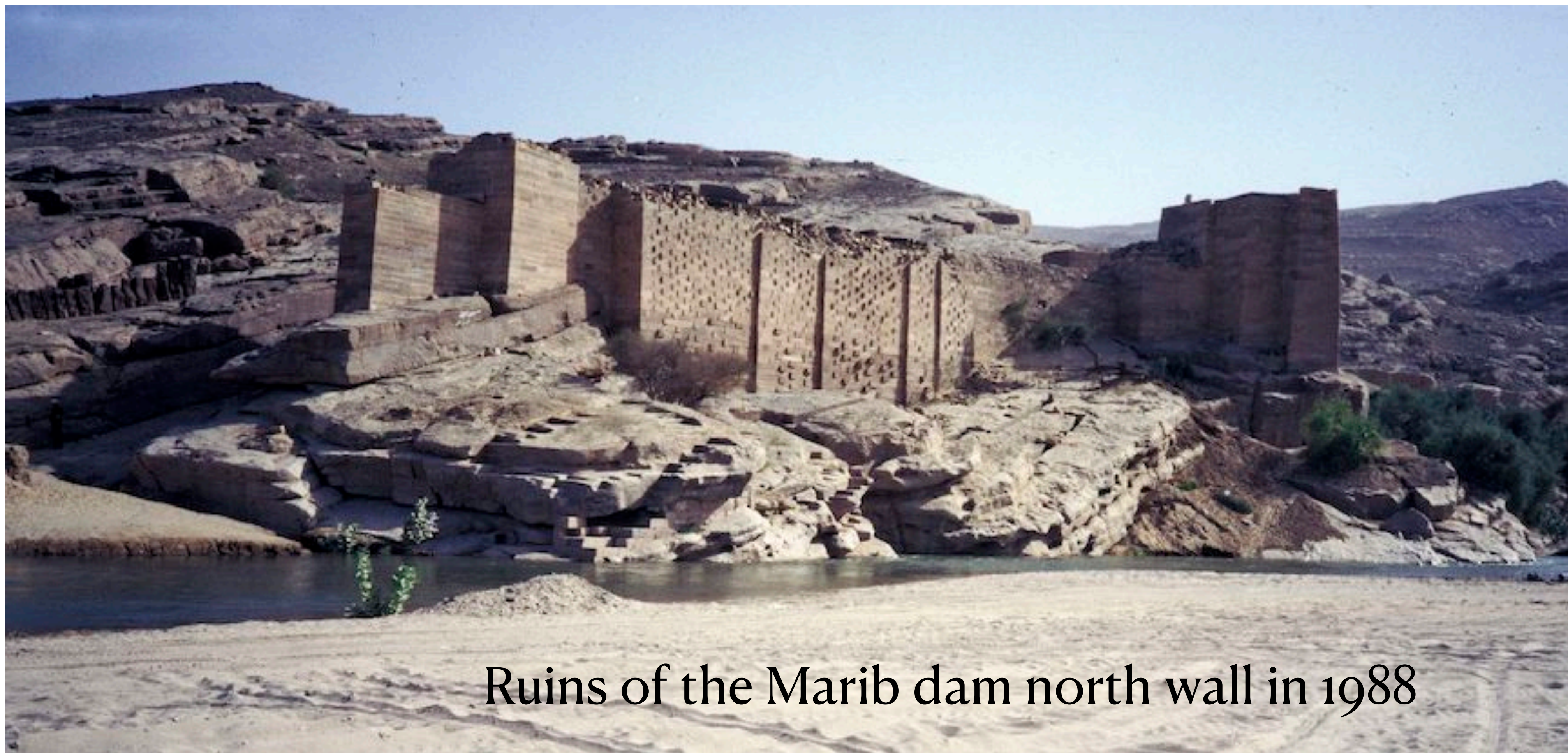


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Ancient Kingdoms of South Arabia (Arabia Felix)

- Kingdom of Saba (12th century BCE – 275 CE)
- Kingdom of Ḥaḍramawt (8th century BCE – 300 CE)
- Kingdom of Qatabān (4th century BCE – 200 CE)
- Kingdom of Ma'in (8th century BCE – 100 BCE)
- Kingdom of Ḥimyar (2nd century BCE – 525 CE)





Ruins of the Marib dam north wall in 1988

One of the marvels of ancient engineering was the Sabaen dam in Marib, near the eastern desert. A dam 14 m high and 650 m long was constructed in the 8th century BCE, but an earlier smaller dam is reported from 2,000 BCE.



Figure 5: Early Sabaic rock inscription from Jabal Balaq al-Qiblī, Ma'rib (photo and facsimile M. Maraqtan)

Translation of a Sabaic text on construction work at the Marib dam

1. *Šayyāṭum son of Yašār and Anbaʿ, the Kabīr of Maydaʿum, the*
 2. *administrator (friend) of (the Mukarrib) Yakrubmalik and (the Mukarrib) Yataʿamar has constructed*
 3. *(the dam) Hardaʿ and the diversion mole, and constructed the foundation and cut in the rock (the dam)*
 4. *Anwat in order to control the flood of the wadi.*

Translation by Mohammed Maraqtan

A Yemeni geographer describes agriculture in the 10th century CE.



Rainfed fields near the Sumara Pass in Yemen

“Among the marvels of Yemen is that most of the crops are grown on rainland (*a‘qār*), comprising the bulk of their bread dough. This is because the agricultural field (*jirba*) soaks up rainwater at the end of *Tammūz* (July) and start of *Āb* (August), after which it is plowed in *Aylūl* (September) when it has absorbed the water and the surface has dried. Then it is plowed another time in *Tishrīn [al-Awwal]* (October), then in *Tishrīn al-Ākhir* (November) a third time. The field is sown in *Kānūn al-Awwal* (January) and the crop stands in it until *Ayyār* (May), when it is harvested without any more water filling it.”

— al-Ḥasan al-Hamdānī (d. 945 CE) in his *Ṣifat jazīrat al-‘Arab* (Description of the Arabian Peninsula)

By the 10th century Yemeni texts record over 50 different food crops and flowers.

Al-Hamdānī mentions 16 different varieties of grapes in one valley near Ṣanaa.

A traveler named Ibn Rusta said there were over 70 kinds of grapes in Yemen.

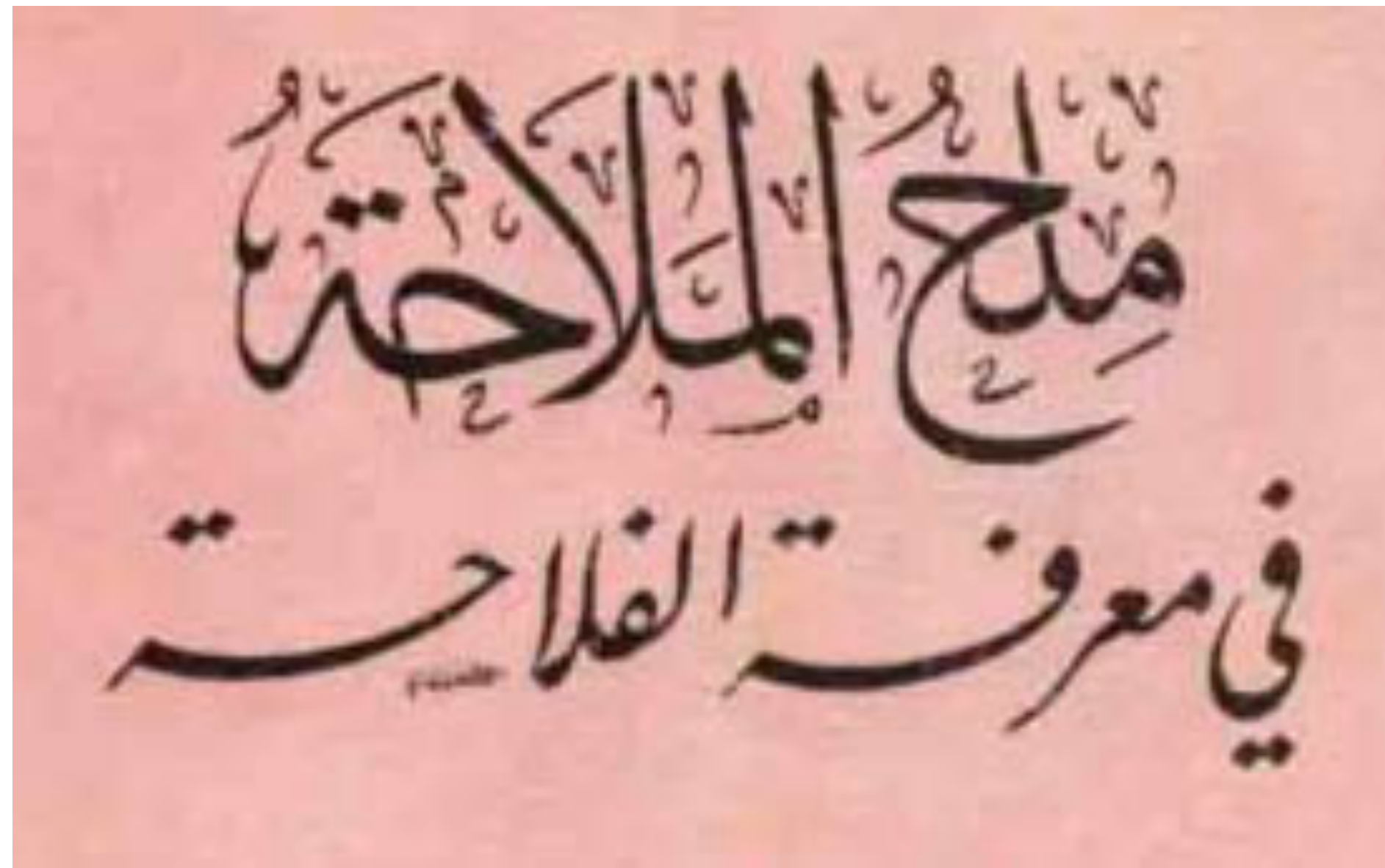


“There is also the *mudabbis* date, which is not surpassed by the *burdī* of Khaybar. My father, may the Most High have mercy, said that when he entered Kufa, Baghdad, Basra, Oman, Egypt, Mecca and other areas with date palms and tasted the dates, he saw none as excellent or as the *mudabbis* dates of Najrān. The great size of the date is unique, filling the palm of the hand with one date.”

— al-Ḥasan al-Hamdānī (d. 945 CE)



Rasulid Era (13th-15th centuries CE) Agricultural Treatises



Milḥ al-malāḥa fī ma'rifat al-filāḥa
(The Fine Art of Agricultural Knowledge)

Al-Malik al-Ashraf 'Umar
(d. 696/1296)

Note: I am currently translating
this early text to English.



Bughyat al-fallāḥin fī al-ashjār al-muthmira
wa-al-Rayāḥīn

(The Farmers' Desired Object
for Fruit-bearing Trees and Aromatic Plants)

Al-Malik al-Afdal al-'Abbās (d. 778/1376)

دو ضرب	اول
نيروز الروم واول دزي البر الفصبي واول دري الصوي	ثاني
ينصرف النيل ويررع اهل مصر	ثالث
طلع الفجر والمالت من الجمع وسط السماء	رابع
تجرح الصبا ووجود الكندر في جبل صبر	خامس
احروف قطع الاخشاب	سادس
اخرايام اللوامح اول رعايه العسوي	سابع
بدو نقص المياه	ثامن
نقل البراعيت بحى الكريج والوفاده الى مصر	تاسع

Month of *Tishrīn al-Awwal* (October)

1. Byzantine New Year.

First sowing of Quṣaybī wheat and first sowing of Ṣawmī sorghum

4. The east wind blows.

Presence of hyacinth bean at Jabal Ṣabr.

7. First planting of 'Ishwī sorghum.

Agricultural almanac of
al-Malik al-Ashraf 'Umar (13th century)

Rasulid era texts mention at least 125 food crops, tree crops, flowers, aromatic plants and herbs grown in Yemen. Over 15 varieties of sorghum are described.



“The land for all the varieties of sorghum in the mountain areas is plowed three times during the winter days, the land being properly prepared, manured and seeded (*tabdharu*). The manner of its seeding (*badhr*) is when the soil is made good through the rainfall in the previously mentioned time periods and when the land becomes neither fully absorbed, dry or [31] runny (*thalṭa*). The most excellent of the conditions for the seeding time is between wetness and dryness. The land is plowed in straight, even furrows (*atlām*), each furrow parallel to the previous furrow, not butting into it. The seed grain is sown in the bottom of the furrow, by the fingertips casting three or four grains or even five depending on the high or low quality of the soil, stepping on the seeds in the path of the bulls and plow (*nibāl*).”

— al-Malik al-Ashraf ‘Umar, *Milḥ al-malāhā*, 13th century CE

Qurfānī sorghum from al-Ahjur

The 14th century Rasulid agricultural text of al-Malik al-Afḍal records a form of biological control against the date palm moth, which has always been a major pest for date palms. This is a far better solution than modern pesticides.

"This caterpillar (dūd) attacks the maturing balaḥ date. You take a small black ant (qa's) from the tamarisk (ithl) tree. Place it at the bottom and top of the tree. Put a piece of wood with these ants near the balaḥ date, and these ants will eat the caterpillar but not the balaḥ date."

al-Malik al-Afḍal al-‘Abbās (14th century CE)



Yemeni dates



*Black ants from the
Yemeni highlands*

In the spring of 1978 I began fieldwork on water resource use, irrigation and traditional agriculture in the central highland valley of al-Ahjur. ca. 2600 m high



At the top of Wadi al-Ahjur there is a line of springs that drain at night into cisterns.



Cistern at Ma'yin, al-Ahjur



Water shares are measured either by the time of flow or by a measurable amount

In the past a simple water clock, a bowl with a hole that water is poured into, measured time like a sand clock
(left)

Using a sorghum stalk to measure the depth of the water in the cistern as it flows out
(right)





The water share flows out of the cistern through open channels that may extend up to a kilometer.

The irrigator follows the flow through the channel network to his fields, making sure it is directed correctly.



Once the water is diverted in to the field, the irrigator works on the mud bunds so that the water stays within the leveled basin.





*Terraces near
al-Mahjar in al-
Ahjur*



Once a field is irrigated, it is plowed, often several times. A scratch plow is pulled by a bull, donkey or camel.



Sorghum seed is sown by dropping seeds into a furrow. Here a young girl guides the bull to keep the furrow straight.

Traditional farming
in Yemen was a
family affair with
women and
children playing
important roles.

Here is use of a
harrow to break to
dirt clods. →



Sorghum has long been the staple grain crop in Yemen.

The seed is used for porridge and bread. The leaves and stalks serve as fodder for domestic animals and the lower stalk is fuelwood for the tannur clay oven.



Sorghum is often harvested by everyone in a community at the same time, as the case here in al-Ahjur.



Highland sorghum in al-Ahjur



Sorghum is threshed by beating with a stick.

Wheat and barley are threshed on a rock threshing floor over which domestic animals draw a large rock or board to crush the stalks.

Later the wheat or barley is winnowed by hand.



Sorghum can be grown at any elevation in Yemen and there are many varieties adapted to the local ecological context.



Sorghum in Hadramawt



Sorghum in coastal Tihama



Sorghum
porridge
(*aṣid*)



Barley
bread
(*sha'ir*)



Sorghum
bread
(*garam*)

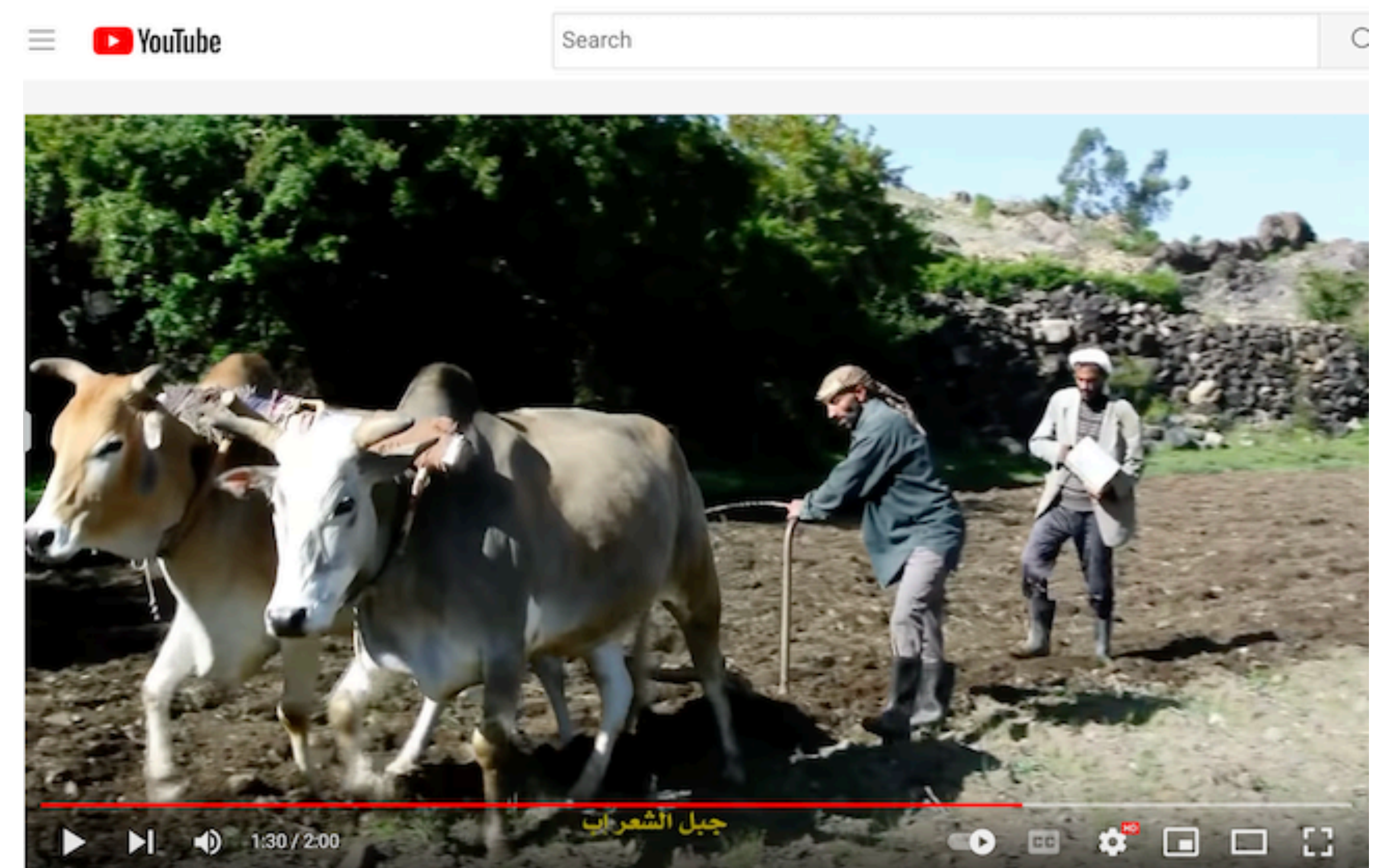
Sourdough
flat bread
(*luḥūḥ*)



If you want to see videos of traditional agriculture in Yemen, there are many sites on Youtube



<https://www.youtube.com/watch?v=OSoj2xRun-U>



<https://www.youtube.com/watch?v=GSCH7X8JRss>

Yemen's Agriculture has declined in the past half century due to uncontrolled sinking of tubewells which drain aquifers and abandonment of terraces built up over centuries as people move to the cities.





YASAD's goals include:

- 1-Conserving and developing agricultural heritage, including local GR (biodiversity).
- 2-Contributing to preserved NR as well as to a revived sustainable management, in the current climatic change perspective.
- 3-Contributing to improved life conditions of rural and urban families, in particular women groups.
- 4-Strengthening agricultural production and supporting farmers' access to marketing, focusing on local seeds and varieties, local animal breeds as well as on organic farming.
- 5-Boosting cooperation, collaboration and networking between farmers, local, national and international Associations and organizations as well as other services sharing the same concerns for developing a sustainable agriculture for socioeconomic purposes.

Yemen has an NGO dedicated to reviving sustainable agriculture, but its efforts have been limited since the war that started in 2015.

Promoting Sustainable Agriculture in Yemen

- Expand dry farming with new modes of water capture and relevant crop choice.
- Yemen's extensive system of highland terraces remains a viable and fertile resource with the potential for cash crops such as coffee.
- Local seed varieties of grains, legumes, fruits and vegetables are well adapted to specific regions and their production can be expanded.
- Reduction of inefficient and excess irrigation must be achieved to mitigate declining water reserves.
- Small dams and cisterns to collect surface runoff have been used in Yemen for over three millennia and these can be repaired and new ones built.
- Yemen's rural population has a long history of community support at the local level.



The following are some of my publications on Yemeni agriculture

- **Qabila, Jirbah and Tanmiyah: Tribes and Agriculture in the Northern Highlands of Yemen.** In Marieke Brandt, editor, *Tribes in Modern Yemen: An Anthology*, 79-93. Vienna: Austrian Academy of Science, 2021. Sammlung Eduard Glaser #XVIII. Open Access at <https://verlag.oeaw.ac.at/tribes-modern-yemen-an-anthology>.
- **Pumping Yemen Dry: A History of Yemen's Water Crisis.** *Human Ecology* 47 (2019):317-329.
- **Agriculture in the Northern Highlands of Yemen: From Subsistence to Cash Cropping.** *Journal of Arabian Studies*. 8(2018/2):171-192.
- **The State of Agriculture in the Mutawakkilite Kingdom of Yemen, 1918-1962: A Documentary Overview.** Österreichische Akademie der Wissenschaften / Austrian Academy of Sciences, AAS WORKING PAPERS IN SOCIAL ANTHROPOLOGY, Volume 32, 2018. Available online at <http://epub.oeaw.ac.at/wpsa32>.
- **Agriculture in al-Hamdānī's Yemen: A Survey from Early Islamic Geographical Texts.** *Journal of the Economic and Social History of the Orient*. 52(2009/3):382-412.
- **Indigenous Knowledge and Traditional Yemeni Irrigation.** In Amin al-Hakimi and Frédéric Pelat, editors, *Savoirs locaux et agriculture durable au Yémen*, Les Cahiers du CEFAS N° 3, 2003. Sanaa: Centre Français d'Archéologie et de Sciences Sociales. Online at <https://books.openedition.org/cefas/2914>.
- **Medieval Folk Astronomy and Agriculture in Arabia and the Yemen.** Variorum Collected Studies. Hampshire, England: Ashgate Publishing Limited, 1997.
- **Medieval Agriculture and Islamic Science: The Almanac of a Yemeni Sultan.** Seattle: University of Washington Press, 1994.
- **Sayl and Ghayl: The Ecology of Water Allocation in Yemen.** *Human Ecology* 11(1983):365-383.

May the current war in Yemen, which has created the worst humanitarian crisis in the world, end and the people of Yemen have peace and security to rebuild their land.

