Herodotus' Journal of the Human and Social Sciences	Volume:10 / N°: 03. (2026), p 68-75

The Ghaitan is a style of palm cultivation in the eastern Algerian desert

الغيطان نمط لزراعة النخيل بالصحراء الشرقية الجزائرية

Boughedada elamir
Mohamed Khider University of Biskra
boughedada.elamir@univ-biskra.dz
https://orcid.org/0009-0008-9009-9089

Received./25/04/2026. *Accepted*12/07/2026...

Abstract:

This study addresses the Ghout system as a unique method of date palm cultivation in the Sahara of Algeria's Souf region. Since the 15th century, local communities have developed an innovative agricultural technique by digging deep depressions in sand dunes to access groundwater, allowing date palms to grow without irrigation or electricity, The paper explores the concept of the Ghout, its construction process, its role in preserving biodiversity, its economic and social contributions, and its recognition as both an agricultural heritage and a touristic landmark.

It also highlights the current challenges threatening the Ghout system, including fluctuations in groundwater levels and the shift toward commercial crops such as potatoes and vegetables, which endangers this unique agricultural legacy, The research concludes that safeguarding the Ghout requires the development of new farming zones, investment in sustainable date palm cultivation, and the promotion of this ecological practice as a vital asset for both the local environment and economy.

Keywords: Ghout system; Souf region; Date palm cultivation; Saharan oases; Groundwater; Biodiversity.

الملخص:

يتناول هذا البحث موضوع الغوط كنمط فريد لزراعة النخيل في صحراء وادي سوف الجزائرية، حيث تمكنت المجتمعات المحلية منذ القرن الخامس عشر من ابتكار أسلوب زراعي يقوم على حفر منخفضات عميقة في الكثبان الرملية لبلوغ المياه الجوفية، مما يتيح للنخيل الاستفادة المباشرة من الماء دون الحاجة إلى الري أو الطاقة، يعرض البحث مفهوم الغوط وطريقة إنشائه، دوره في حفظ التنوع البيولوجي والإنتاج الزراعي، وأهميته الاقتصادية والاجتماعية، إضافة إلى كونه تراثًا زراعيًا وسياحيًا مميّزًا.

كما يبرز التحديات التي تواجه الغيطان اليوم، مثل تقلب منسوب المياه والعزوف عن زراعة النخيل لصالح الزراعات التجارية، مما يهدد هذا الموروث الزراعي الفريد بالاندثار، يخلص البحث إلى ضرورة حماية الغوط عبر تنظيم مسالك جديدة وتوسيع الاستثمار في زراعة النخيل البعلي، باعتبارها طريقة مستدامة تحافظ على الموارد المائية وتدعم الاقتصاد المحلي.

كلمات مفتاحية: الغوط، وادي سوف، زراعة النخيل،الواحات الصحراوية، المياه الجوفية، التنوع البيولوجي.

• Introduction:

Desert communities have managed to make date palm cultivation possible without the use of irrigation systems or electricity by creating green oases among the ridges and sand dunes across vast expanses of sand, The Ghout represents a unique and valuable source of livelihood for farmers living far from urban areas, and it is also a source of inspiration in terms of technical innovation to combat desertification and climate change.

The Ghout are unique oases located in the province of El Oued in southeastern Algeria. Since the 15th century, the local Soufi community has cultivated palm trees in these areas by controlling the impact of hot, dust-laden desert winds, using palm fronds (jareed) as windbreaks.

Local farmers dig pits in the dunes about ten meters deep to reach groundwater, and palm trees are planted directly above the water table, where they have direct and continuous access to the region's scarce groundwater resources.

In this research paper, we will attempt to address:

- What the ghat is and how it is constructed.
- The ghat, biodiversity, and its economic role.
- The status of the ghat.

1. The Meaning of "Ghut" and How It Is Formed.

1.1 The Meaning of "Ghut"

A linguistic term derived from the verb "ghawwata" (to dig), which is conjugated as "yaghwita" (he digs), "taghwita" (he digs), and 'maghwita' (he is dug), with the passive form being "maghwata" (dug).

Gawwata al-bi'r: he dug it and deepened its bottom.

The plural forms are aghawat, ghiyat, and ghaytan.

It is a wide, sunken area of land, characterized by its extreme depth and distance[1] .

Regarding this, Abu Hanifa al-Nu'man said: "The ghot is one of the low-lying areas of the fertile earth; a single ghitān is a gha'it, and whatever slopes downward in the earth has gha'at. He said: 'They claimed that the gha'it might be a farsakh in size and contained gardens[2] .'"

As for its local meaning, it refers to unique oases located in the province of Wadi Souf in southeastern Algeria, dating back to approximately the 15th century CE, In these oases, the local communities of Souf plant date palms by harnessing the desert winds, using palm fronds (al-jareed) as windbreaks by arranging them around the oases after extracting the sand and piling it around them in an almost circular shape.

They utilized these depressions for planting palm trees due to their proximity to groundwater, allowing the palm to absorb water from the aquifer without the farmer having to water it. This method was known in the region as "al-Ba'ali." Thus, any resident of the Wadi Souf region in the past could plant palm trees in the ghats and travel to work in another distant area, as his palms did not require watering. He would return in the spring to pollinate them and in the fall to harvest their yield.

1.2 Construction Method:

---

[1] -Ahmed Mukhtar Abdel Hamid Omar—Dictionary of Contemporary Arabic—Al-Alam Books—Egypt—2008.

[2]- Ibn Manzur, *Lisan al-Arab* (Dictionary of the Arabic Language), Dar al-Ma'arif, Alexandria, Egypt, 2016.

Farmers dig a depression in the dunes about ten meters deep, and palm trees are planted directly above the water table, where they have direct and continuous access to scarce groundwater resources[3] .

Initially, baskets were used to lift the sand, and farmers exerted considerable physical effort to complete the ghot, typically using a tool called a toiza. Those who work in this field are called “sand lifters,” and this is the essential process when starting a new ghot or expanding an old one. The ghot owner either carries out this work himself or hires workers called “rammala,” who use baskets, buckets, shovels, and pulleys in their work.[4].

The process of creating the ghat is carried out by carrying sand on one’s back in a kaffa or using donkeys and mules; it is a very tiring and arduous process. **However,** with their determination, perseverance, and love for the land and the development of the region, our fathers and grandfathers created the ghats, which are a source of pride for the region and a testament to their ingenuity and defiance of the natural elements represented by the sand and its encroachment.

The Soviet farmer digs a large pit measuring hundreds of meters in length and width, with a depth of up to 16 meters.

Once the pit is dug, he begins planting the “hashan” (a young palm sapling between 3 and 6 years old) at a distance of about two meters from the water. A few days after the work, preparation, and watering are completed, the roots of the young palm extend into the water by several centimeters and then settle. The farmer leaves them in God’s care, as the palm drinks without him having to exert any effort to water it[5] .

It is worth noting that palm cultivation has been steadily increasing over the years; the number reached 60,000 palms in 1860, rose to 154,000 palms in 1883, and reached 160,000 palms in 1887, By the end of the 19th century, the number exceeded 202,000 in 1900 and reached approximately 450,000 in 1960; however, a decline was observed in 1982, when the number of palm trees stood at only 151,000.

2. The Ghat, Biodiversity, and Economic Role:

2.1 The Ghat and Biodiversity:

[3] - Bashir Khazani—Academic Researcher—College of Natural and Life Sciences—Al-Wadi University—Available at:
https://openknowledge.fao.org/server/api/core/bitstreams

[4] -" “Al-Ghout” ... an agricultural technique unique to Wadi Souf, a documentary available at the following link: https://www.youtube.com/watch?v=4a72PQdYBDc

[5] - The Ghout Oasis System in the Province of El Oued, Algeria; A Unique Wind Management System Adapted to Life in the Desert, Food and Agriculture Organization of the United Nations (FAO), available at: https://openknowledge.fao.org/server/api/core/bitstreams

The Ghat is considered a biodiversity hotspot; in simple terms, it is rich in wildlife, as it is home to many species of insects and small animals such as hedgehogs and others[6] .
In addition to agricultural biodiversity, farmers facing harsh climates have long selected date palm varieties adapted to local conditions. The preservation of these date palm varieties relies on ancestral knowledge regarding their management, fertilization, propagation, and harvesting[7] .

Today, approximately twenty-six varieties of date palms are cultivated in Al-Ghout, all of which are known for their exquisite taste. Thanks to the local climate created by the oases, it is also possible to grow vegetables and other grains and raise small livestock.

2.2 Its Economic Role:

The ghats have yielded the immense wealth that Wadi Souf has gained from this agriculture; they currently comprise more than 1,854 ghats with over 1.5 million date palms. Farmers in Wadi Souf have also revived the production of nearly extinct products from small-scale goat farming, and local breeds of pigeons have been reintroduced to generate additional income within the ghats.

Many medicines and chemicals can also be produced from dates, such as penicillin, erythromycin, various antibiotics, vitamin B12, synthetic citric acid, tartaric acid, and certain hormones. Dates also contain approximately 13 minerals, 6 types of vitamins, about 13 active acids, and 5 types of sugars, as well as proteins and fats[8] .
Dates are also a primary source for a new drug called “Deustans” used to treat rheumatism and eye diseases. All these substances are found in all varieties of dates, including: Dakhla Nour, Al-Ghars, Fatimi, White Dakhla, Takramest, Hamraia, Ali Warash, Tafrazit, Tachrouit, Tamrazit, Masouhi, Boufqous, Taouracht, Adfar Al-Qat, Tanslit, Safraia, Amaria, Tansin, Tafzouine, Tantaboucht, Warashi, Qatara, Al-Ghadamsi, Qasbi, Asba’a Arous, Fizani, Kaboul Fatimi, Litiem, Kasbaia, Taslouit, Al-Shawaka, Abdelaziz, Al-Jaiha, Al-Shahba, Al-Htila, Al-Ajruna, Sabri, Lulu, Umm Al-Ftousha, Al-Karkoubia, Al-Baloutia, Al-Maftoula .. [9].

3. The Condition of the Ghats:

The ghats are subject to the phenomena of rising and falling water levels, which have recently emerged in the Wadi Souf region and have negatively impacted this forest resource as a result of landfilling activities that have affected the majority of the ghats, thereby threatening this resource with extinction[10] .

---

[6] -The Ghout Oasis System in the Province of El Oued, Algeria; A Unique Wind Management System Adapted to Life in the Desert, Food and Agriculture Organization of the United Nations (FAO), available at: https://openknowledge.fao.org/server/api/core/bitstreams

[7] - A city of earth, water, and the spirit of nature... “Ghitan” in Wadi Souf encapsulates a philosophy of life, Al-Ayyam newspaper, available at:
https://elayem.news/111244.html

[8] - Benefits of dates, available at the following link:
https://www.aljazeera.net/health/2024/3/23

[9] - There are more than 300 varieties of dates in Algeria. Available at:
https://softdatte.com/

[10] - For further reading on this topic, see:

Added to this is the general disinterest in agriculture in recent years and the failure to seriously appreciate the irreplaceable wealth possessed by the Wadi Souf region, namely the ability to plant crops directly in water without the need for irrigation, electricity, or the effort of long-term maintenance; for without irrigation, this is considered a rare wonder. Otherwise, how could people have settled in such large numbers, scattered across the plains and throughout this eastern region in every nook and cranny[11] ?

Many new farmers have turned to commercial crops such as potatoes and vegetables, abandoning dates, whose production has seen a drastic decline in the Wadi Souf region.

• Conclusion:

The oasis system in the Souf Valley stands as a symbol of the resilience of the Souf farmer, who has adapted to the harsh natural environment and transformed the desert sands into a green paradise for hundreds of years.

To preserve this achievement, roads must be built to the areas designated as palm groves, while ensuring the creation and distribution of new, organized groves.

Continued investment in this agricultural activity is essential to open up new horizons for the region, especially since studies have shown that planting date palms does not cause any water waste; the palm takes only as much water as it needs. Efforts must also be made to ensure that the process of supporting the Ghout communities includes all suitable areas across all municipalities of the Souf Valley.

Recommendations

Protecting the Guitan Ecosystem:

Guitans should be included in the Global Agricultural Heritage Lists as a unique model of sustainable agriculture, and efforts should be made to designate them as areas of ecological and cultural significance to protect them from extinction.

Revitalizing Traditional Farming Practices:

Encourage local farmers to return to upland palm cultivation by providing financial and technical support, and offering incentive programs specifically for young farmers.

Modernizing Ghaith Management Practices:

Integrating modern technologies into the management of the ghouats (such as digital monitoring of groundwater levels) without compromising the essence of the traditional system.

Establishing specialized research centers:

Establishing a national or local center to study the ghouats and the environmental changes affecting them, in collaboration with Algerian universities and agricultural and environmental research centers.

MILOUDI Abdelmonem, “Mechanisms and Remedies for Rising Water Levels in the Oued Souf Region: Impact on the Regional Environment,” Ph.D. thesis in Hydraulic Engineering and Planning, Kasdi Merbah University, Ouargla, 2018–2029.

[11] - Al-Ghout... A traditional farming model facing extinction, available at the following link: https://www.google.com/search?q

Promoting the Ghout as a tourist and cultural resource:

Developing eco-tourism and cultural tourism around the Ghout oases by creating tourist trails and documenting the local heritage associated with them.

Raising environmental awareness:

Incorporating the topic of the Ghout into educational programs and local cultural activities to foster environmental awareness and a sense of heritage among new generations.

Addressing Unplanned Urban Expansion:

Develop urban plans that preserve the natural environment of the ghats and prevent modern urban development from encroaching upon them.

Diversifying Production Within the Ghats:

Encourage the cultivation of secondary crops adapted to the local environment (such as forage crops and desert vegetables) to broaden the foundation of local food security.

Strengthening partnerships with international organizations:

Collaborate with organizations such as the FAO and UNESCO to exchange expertise and benefit from support programs targeting traditional agricultural systems.

Documenting local knowledge:

Record farmers' traditional knowledge regarding the establishment and maintenance of ghats in a national archive to preserve this cultural and scientific heritage for future generations.

• Appendices:

Appendix No. 01: Al-Zuroob



Appendix No. 02: The Sand Lifter (Through the Researcher's Lens)



- **Bibliography**:

1. A city of earth, water, and the spirit of nature... "Ghitan" in Wadi Souf encapsulates a philosophy of life, Al-Ayyam newspaper, available at: https://elayem.news/111244.html
2. Ahmed Mukhtar Abdel Hamid Omar—Dictionary of Contemporary Arabic—Al-Alam Books—Egypt—2008.
3. Al-Ghout... A traditional farming model facing extinction, available at the following link: https://www.google.com/search?
4. " "Al-Ghout" ... an agricultural technique unique to Wadi Souf, a documentary available at the following link: https://www.youtube.com/watch?v=4a72PQdYBDc
5. Bashir Khazani—Academic Researcher—College of Natural and Life Sciences—Al-Wadi University—Available at:
6. https://openknowledge.fao.org/server/api/core/bitstreams
7. https://www.aljazeera.net/health/2024/3/23
8. https://softdatte.com/
9. Ibn Manzur, *Lisan al-Arab* (Dictionary of the Arabic Language), Dar al-Ma'arif, Alexandria, Egypt, 2016.
10. MILOUDI Abdelmonem, "Mechanisms and Remedies for Rising Water Levels in the Oued Souf Region: Impact on the Regional Environment," Ph.D. thesis in Hydraulic Engineering and Planning, Kasdi Merbah University, Ouargla, 2018–2029.

11. The Ghout Oasis System in the Province of El Oued, Algeria; A Unique Wind Management System Adapted to Life in the Desert, Food and Agriculture Organization of the United Nations (FAO), available at: https://openknowledge.fao.org/server/api/core/bitstreams
12. The Ghout Oasis System in the Province of El Oued, Algeria; A Unique Wind Management System Adapted to Life in the Desert, Food and Agriculture Organization of the United Nations (FAO), available at: https://openknowledge.fao.org/server/api/core/bitstreams