



REPORT

Awareness day on the importance and conservation of the Ziziphus tree

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Lamia Al-Hamrouni¹, Azaiez Ouled Belgacem², Sawsan Hassan² & Mounir Louhaichi²

¹The Institut National de Recherches en Génie Rural, Eaux et Forêts (INRGREF) Tunis, Tunisia

²The International Center for Agricultural Research in the Dry Areas (ICARDA), Tunisia



INITIATIVE ON
Livestock and Climate

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Introduction

Silvopastoral systems represent a harmonious and integrated land management strategy that combines the cultivation of trees or shrubs with livestock grazing. Based on the synergy between forestry and animal husbandry, silvopastoralism aims to optimize the use of available land resources while adopting sustainable agricultural practices. In this system, trees and shrubs serve dual roles as providers of essential forage for grazing animals and contributors to ecological health. The integration of vegetation with pasturelands not only addresses the nutritional needs of livestock but also contributes to soil conservation, biodiversity enhancement, and carbon sequestration. Silvopastoral systems are suitable for diverse environmental conditions, demonstrating adaptability to various climates and landscapes. As a model of agroecological balance, these systems illustrate the potential for sustainable harmony between agriculture and forestry, offering a pattern for resilient and environmentally conscious land use.

In silvopastoral systems, trees play a versatile and pivotal role in enhancing both agricultural and environmental outcomes. Adapted trees, carefully selected to grow in specific climatic and soil conditions, contribute significantly to the sustainability of these systems. Their primary function lies in providing a renewable source of forage for grazing animals, offering nutritious leaves, pods, or browse that supplement the livestock's diet. Beyond their role as a fodder source, trees act as natural shelters, providing shade and protection to livestock, particularly in arid or extreme weather conditions. Moreover, the root systems of adapted trees play a crucial role in soil conservation, preventing erosion and enhancing water retention.

Furthermore, trees contribute to the livelihoods of farmers through a diverse collection of benefits. Fruit trees in these systems not only enhance the nutritional value of the human's diet but also present an additional source of income for farmers through the sale of fruits. Furthermore, certain tree species with medicinal properties offer valuable resources for traditional healthcare, serving as a natural pharmacy within the agroecosystem. Additionally, the presence of flowering trees contributes to bee production, facilitating honey production and apiculture activities.



This interaction between adapted trees and the overall ecosystem highlights their significance in adopting sustainable land management practices, where agricultural productivity and environmental conservation go hand in hand.

Within silvopastoral systems in Tunisia, a variety of tree species play a crucial role in bolstering the agricultural and environmental objectives of these integrated land management strategies. Adapted to the specific climatic and soil conditions of the region, carefully selected tree species in Tunisian silvopastoral systems contributes to the broader goals of environmental preservation and community livelihoods.

The genus *Ziziphus* belongs to the family Rhamnaceae and comprises about 170 species distributed in tropics and subtropics regions of the world. They are well known by their economic and medicinal importance. Several species of *Ziziphus* were used in traditional medicine and in treatment of various diseases.

The genus *Ziziphus* is notably diverse in Tunisia, comprising three species, each contributing significantly to the ecological and economic landscape of the region. Among these, *Ziziphus lotus* stands as a native species, deeply rooted in Tunisia's natural environment. Additionally, the introduced species *Ziziphus spina-christi* and *Ziziphus mauritaniana* (synonymous with *jujuba*) have integrated into the diverse environmental conditions of the country, exhibiting their adaptability over an extended period. Locally known as Sidr, both *Z. lotus* and *Z. spina-christi*, and Ennab for *Z. mauritaniana*, these species play multiple roles in Tunisia's landscape.

The versatility of these *Ziziphus* species extends beyond their native or introduced status, as they are recognized for their multipurpose utility. They contribute greatly to environmental conservation efforts, actively participating in soil preservation, water conservation, and the enhancement of biodiversity, exemplifying their role as environmental stewards.

Moreover, the economic impact of these *Ziziphus* species is considerable, both at the national and local levels. The fruits, leaves, and roots, particularly of the introduced species, hold nutritional, cosmetic, and medicinal benefits. This multifunctionality highlights the interaction between the conservation of natural resources and the sustainable economic growth of the region. As these *Ziziphus* species continue to demonstrate their adaptability, they emerge as invaluable options in Tunisia's plan towards a balanced and resilient ecological and economic landscape.



Despite the multiple benefits that *Ziziphus* species offer, there is a pressing need to raise awareness about their importance and proper management. Engaging various stakeholders, including farmers, local communities, and policymakers, becomes pivotal in ensuring the sustainable cultivation and utilization of these valuable resources. Educational initiatives should emphasize the ecological roles of *Ziziphus* in preserving soil, conserving water resources, and enhancing biodiversity. Additionally, raising awareness about the economic potential of *Ziziphus*, especially among farmers, can lead to more sustainable land management practices. By promoting a deeper understanding of the multifunctionality, benefits, and proper management techniques, farmers and other stakeholders can collectively contribute to the use, preservation, and enhancement of *Ziziphus* species within Tunisia's diversified ecological zones.

Within the framework of the Livestock and Climate Initiative of the OneCGIAR (LCSR), the National Institute for Research in Rural Engineering, Water and Forestry (INRGREF), with the support of the International Center for Agricultural Research in the Dry Areas (ICARDA) and in collaboration with the Hive Association for Active Citizenship in Tozeur, organized an awareness-raising day on the importance of the *Ziziphus* tree and its preservation in the region of Tozeur, southern Tunisia.

Objectives

The fied day is intended to achieve the following objectives:

- Highlight the importance of the genetic diversity of the *ziziphus* species in Tunisia and more particularly in Tozeur oasis
- Underline the environmental and economic importance of the *Ziziphus* species
- Develop and enhance the skills and capacities of the stakeholders of the *ziziphus* sector (governmental institutions, development agencies, research institutions, Cooperatives and GDAs, beekeepers, Livestock keepers,)
- Identify the challenges facing the valorization of *ziziphus* species and the necessity of their conservation through protection and management (best-practices).
- Suggest key recommendations to enhance this sector.



Facilitators

The course was facilitated by Dr. Lamia Hamrouni, Dr. Imtinen Hamdeni and Ing. Fadia Derbali from INRGREF. Dr. Salem Ben Slama and Dr. Sondes Ouederni from the Hive Association for Active Citizenship.

Participants

The field day took place in Tozeur on December 13, 2023, with total of 37 participants. 13 attendees represented key organizations such as the Regional Commission for Agricultural Development (CRDA), the Agricultural Investment Promotion Agency (APIA), and the Interprofessional Group of Dates (GID). Research institutions, including the National Institute for Research in Rural Engineering, Water, and Forestry (INRGREF), were represented by 4 participants, while 5 trainees represented various non-governmental organizations (NGOs) such as the Hive Association and local GDA. The diverse group also included 6 beekeepers and 9 farmers, creating a rich mixture of perspectives. It conveys that out of the total participants, 20 were women, making up approximately 54% of the workshop attendees (the attendance sheet is provided as Annex-1).



Figure 1. A photo group of the Participants attended the awareness-raising day in Tozeur, Southern Tunisia.

Proceedings

The agenda (Annex 2) includes presentation sessions in the morning and a field visit and works in the afternoon.

The morning presentations focused on highlighting the significance of the Ziziphus tree, emphasizing its crucial role in soil protection, pasture enhancement, and elevating the



standard of living in this vital region. A comprehensive discussion on the pivotal role of the Ziziphus tree in addressing challenges associated with climate change was a key highlight of the event. The following topics were presented and thoroughly discussed:

- Presentation of Ziziphus tree and its environmental importance
- Challenges facing the Ziziphus tree and best conservation methods
- Ziziphus tree health and economic benefits
- Plantation and management of Ziziphus tree.



Figure 2. Participants receiving information on Ziziphus tree trees during the presentation session.

In the afternoon, the participants visited Sidi Ali Bou Lifa in Tozeur where the oldest Ziziphus tree in the Djerid region is located. After that, they were trained in the transplantation of 20 seedlings of *Ziziphus* in a specific forest area. This activity reflects their commitment to preserving this valuable tree due to its environmental and economic importance. The importance of the role of the local community in preserving the tree and contributing to building a sustainable environment was emphasized.





Figure 3. A huge tree of *Z. mauritaniana* visited by the workshop attendees in Sidi Ali Bou Lifa in Tozeur, Tunisia (the oldest tree in the Djerid region).



Figure 4. Participants engaged in the planting of *Ziziphus* seedlings.

Recommendations

Several recommendations have been developed to ensure the continuity of this awareness and the preservation of this important environmental heritage. Below are the main recommendations of the workshop:

1. A study on valuing drainage water in planting Ziziphus tree trees and establishing a green belt:
 - Conducting a comprehensive study on the use of drainage water in the cultivation of the Ziziphus tree tree.
 - Encouraging the creation of a green belt that protects and enhances the growth of the Ziziphus tree tree.
2. A study on forest and pastoral trees in the Djerid region and their characteristics:
 - Conduct a detailed study on the biological diversity of forest and pastoral trees in the Djerid region.
3. Intensifying guidance and awareness-raising about the importance of the Ziziphus tree through developing effective awareness campaigns to disseminate information about the benefits and importance of the Ziziphus tree tree.
4. A study on the characteristics of the Ziziphus tree tree and its industrial, medical, and fodder valuation through conducting a comprehensive study on the physical and chemical properties of the Ziziphus tree tree and how to invest it in industry, medicine, and animal feeding.
5. Establishing experimental platforms and field and research schools:
 - Establishing platforms for research and experiments to support innovation and knowledge exchange.
6. Creating new areas for Ziziphus tree cultivation and encouraging the participation of youth within the framework of agricultural projects support.
7. Special programs for environmental education within environmental clubs to encourage young people to preserve and plant Ziziphus tree .
8. Establishing laws and incentives that encourage farmers to grow Ziziphus tree in the Jreid area.



9. Official request to be addressed to the DGF and municipalities to support the cultivation of Ziziphus tree on the tree day.
10. Support scientific research on rangeland species and orienting the support and encouragement to scientific research specialized in developing Ziziphus tree cultivation.
11. Imposing laws prohibiting the uprooting of the Ziziphus tree tree

Conclusion

The workshop and the meeting with many stakeholders confirmed that we are assisting at a loss of the genetic resources of Ziziphus species and the importance of preserving this diversity both with protection and with planting the seedlings either in the forest and rangeland areas or in the agricultural fields, particularly in the oasis.

Many recommendations have been developed in light of the discussions made after the presentation sessions or in the field which will permit enhanced awareness and preserve the Ziziphus tree as an essential part of the environmental diversity in the Djerid region.

It is noteworthy that this day was not just an awareness-raising event, but rather a comprehensive learning experience among and between the participants.

We expect that these environmental and awareness activities will be the basis for more sustainable events in the future, enhancing awareness of the importance of the Ziziphus tree tree and enhancing community participation in preserving the environment and biodiversity. Development and conservation projects and efforts (protection, planting) can be suggested to allow the expansion of this threatened species. On the other hand, it is necessary to encourage the pharmaceutical and/or cosmetic industry to manufacture products based on the Ziziphus tree.

Such awareness-raising events and the active participation of the local community should continue in the future to enhance awareness of the importance of the Ziziphus tree tree and contribute to preserving its environmental diversity and improving the quality of life in the region.



Annex 1. Agenda of the workshop



INITIATIVE ON
Livestock and Climate

يوم تحسيسي حول

أهمية شجرة السدر والحفاظ عليها

13 ديسمبر 2023 - نوزر

البرنامج

المتحدث	المحور	التوقيت
التسجيل		09 :00-08 :30
د. لمياء الحمروني المعهد الوطني للبحوث في الهندسة الريفية و المياه و الغابات	تقديم البرنامج و المحور	09 :30-09 :00
د. امتنان حمداني المعهد الوطني للبحوث في الهندسة الريفية و المياه و الغابات	مداخلة 1 : أهمية شجرة السدر في البيئة والتعريف بها	10 :00-09 :30
د. سالم بن سلامة رئيس جمعية المنحلة للمواطنة الفاعلة بنوزر	مداخلة 2 : دراسة الاستراتيجيات التشاركية بتطوير سلسلة قيمة عسل النحل بالواحات	10 :30-10 :00
استراحة قهوة		11 :00-10 :30
فادية دربالي المعهد الوطني للبحوث في الهندسة الريفية و المياه و الغابات	مداخلة 3 : زراعة والعناية بشجرة السدر	11 :30-11 :00
مهندس ودرني جمعية المنحلة للمواطنة الفاعلة بنوزر	مداخلة 4: التحديات التي تواجه شجرة السدر وسبل حمايتها	12 :00-11 :30
تبادل ومناقشة أبرز التوصيات.		13 :30-12 :00
الغداء		15 :00-13 :30
زيارة ميدانية و زراعة بعض الشتلات لنبتة السدر		17 :00-15 :00



Annex 2: List of participants

					
<p>Science for resilient livelihoods in dry areas</p> <p>Initiative on Livestock and Climate</p>					
<p>يوم تحسيسي حول</p> <p>أهمية شجرة السدر والحفاظ عليها</p> <p>13 ديسمبر 2023 - توزر</p> <p>ورقة حضور</p>					
الإمضاء	رقم الهاتف	البريد الإلكتروني	الاسم واللقب	الصفة	
			الحاجي سويدي	رئيس بلدية	1
			عنا طيف بوقفة	الادارة الجهوية للتربية	2
		Technicien en Biologie	فرياء هادي		3
			لمياء الصروكي	باحثة	4
		تقني سامي	فادية الدربالي		5
		باحثة	إيمان حمداني		6
		رئيس اتحاد الفلاحين	عادل بعبارة	INRGREF	7
		INRGREF	سفيان بوربيع		8
		تقني سامي	وفاق محواشي		9

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الإمضاء	رقم الهاتف	البريد الإلكتروني	الصفة	الاسم واللقب	
			فلاحه email	برهوي خاضة	10
			مصرر	عبارت حسن	11
			صاحبة مشروع	حوال الحامي	12
			المجمع الوطني للشركاء	ادخامة السريفي	13
			APIA-Tozour	بنة خيرة عا	14
			مربية دمل	لمهي حشف	15
			فلاح	ابراهيم حشف	16
			فلاح	محمد السعيد المهي	17
			استاذة	لمهي لى مودرنى	18
			فلاحه	حليمة وحييت	19
			فلاح	ميلود الخول	20
			فلاح	أمين ملبا	21
			فلاح	رايا في المكنوني	22
			حرفلة	هاجره وحييت	23
			رئيسة صالحة	عبد الحميد الشكمانى	24
			رئيسة مجمع صالحة	محمد جليلي	25

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			م. حامية مشروع	حفيفة الصويحي	26
			م. دقتو أول	الطيب الشاطر	27
			م. دقتو أول	مراد الأسور	28
			م. حامية مشروع	أمينة الزوي	29
			م. حامية مشروع	نصري فقير	30
			La Ruche	أيهاب برحالة	31
			م. دقتو أول	نظام دهن	32
			La Ruche	مروان سامية	33
			م. حامية مشروع	المحمد النواحي	34
			م. حامية مشروع	بالي الرايس	35
			م. حامية مشروع	ثلاثة العزيزي	36
			م. حامية مشروع	لبي سويحي	37
					38
					39
					40

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The **CGIAR Research Initiative on Livestock and Climate** is designed to address the challenges that climate change poses to livestock production, providing livestock-keeping communities with the support they need without accelerating greenhouse gas emissions or degrading land, water, and biodiversity.

It forms part of CGIAR's new Research Portfolio, delivering science and innovation to transform food, land, and water systems in a climate crisis.

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