Strengthening governance for sustainable silvopastoral restoration and enhanced livelihood

21 July 2023

Mounir Louhaichi & Sawsan Hassan
The International Center for Agricultural Research in the Dry Areas (ICARDA), Tunisia
About Livestock and Climate Initiative
The CGIAR Research Initiative on Livestock and Climate addresses the challenges that climate change poses to livestock production, supporting livestock-dependent communities without accelerating greenhouse gas emissions or degrading land, water, and biodiversity.

To cite this baseline report

Disclaimer: This report has not been peer-reviewed. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies or opinions of the CGIAR, ICARDA, donor agencies, or partners. All images remain the sole property of their source and may not be used for any purpose without written permission of the source.
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBO</td>
<td>Community-Based Organization</td>
</tr>
<tr>
<td>CGIAR</td>
<td>The Consortium of International Agricultural Research Centers</td>
</tr>
<tr>
<td>CRDA</td>
<td>Regional Commissary for Agricultural Development</td>
</tr>
<tr>
<td>DGF</td>
<td>the General Directorate of Forests</td>
</tr>
<tr>
<td>GDA</td>
<td>Groupement de Développement Agricole “Agricultural Development Groups”</td>
</tr>
<tr>
<td>ICARDA</td>
<td>The International Center for Agricultural Research in the Dry Areas</td>
</tr>
<tr>
<td>LCSR</td>
<td>The Livestock and Climate OneCGIAR initiative</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
</tbody>
</table>
Strengthening governance for sustainable silvopastoral restoration and enhanced livelihood

Introduction
One of the primary advantages of silvopastoral systems in dry areas lies in their ability to enhance land productivity and resilience. The integration of trees with forage and livestock provides a diversified and stable production system that can withstand the harsh conditions prevalent in arid regions. Trees act as windbreaks, reducing soil erosion and evaporation, while also providing shade and shelter for livestock. The combination of various plant components contributes to improved forage quality and availability, ensuring a more reliable feed source for grazing animals, particularly during periods of drought.
Furthermore, the presence of trees in silvopastoral systems offers environmental benefits. Their deep-rooted systems contribute to soil conservation, preventing desertification and promoting water infiltration. This is especially crucial in regions prone to land degradation and desert encroachment. Additionally, the increased vegetation cover aids in carbon sequestration, mitigating the impact of climate change and fostering a more sustainable carbon balance. Silvopastoral systems also have social implications, positively influencing the livelihoods of communities in the dry areas. By diversifying income sources through agroforestry practices and integrating livestock management, these systems contribute to increased economic stability for local communities. The availability of wood and non-wood forest products further enhances the economic value of silvopastoral systems. In terms of biodiversity conservation, silvopastoral systems can serve as valuable habitats for various plant and animal species. The diverse structure of these systems, with trees, shrubs, and forage plants, provides niches for different organisms, contributing to increased overall biodiversity. This aspect is particularly relevant in regions where conventional agricultural practices may lead to habitat loss and fragmentation. Despite their numerous benefits, the establishment and successful management of silvopastoral systems in dry areas pose challenges. Selecting tree species that are well-adapted to the local climate and ensuring proper management practices are essential for achieving optimal outcomes. Community engagement, capacity building, and the integration of traditional knowledge into modern practices are vital components for the successful implementation of silvopastoral systems. In the Tunisian context, the successful implementation of silvopastoral systems in dry areas is closely tied to effective governance mechanisms. The governance structure plays a pivotal role in guiding land-use policies, fostering community participation, and ensuring sustainable practices. Collaborative efforts involving government agencies, local communities, and non-governmental organizations (NGO) are essential for developing and enforcing policies that promote the integration of trees, forage, and livestock in a manner that aligns with ecological and socio-economic objectives. Community-based governance models empower local stakeholders, encouraging their active involvement in decision-making processes and enhancing the resilience of silvopastoral systems. Establishing clear frameworks for land tenure, resource access, and benefit-sharing is crucial for addressing potential conflicts and ensuring the equitable distribution of the advantages provided by these systems. Effective governance, rooted in transparency, including everyone, and following ecological principles, is crucial for successfully adopting and long-term sustainability of silvopastoral systems in Tunisia's dry areas. Sbaihia Site, situated in the Jimla sector of the Zaghouan governorate, faces challenges associated with a variable and limited rainfall regime. The region, characterized by agriculture, features a mix of crops and forests/rangelands. The site, managed by the Forestry Department, spans 4,700 hectares and plays a crucial role in the agrosilvopastoral production system, supporting the livelihoods of farming communities in the Near East and North Africa region. With climate change impacts and a growing population, the need for sustainable land use practices is imperative Figure 1.
The site has faced challenges such as insufficient feed resources for livestock herds, leading to the potential for overgrazing. Agricultural and topographic configurations present opportunities for pastoral practices. With support from the Livestock and Climate Initiative of the One CGIAR, the International Center for Agricultural Research in the Dry Areas (ICARDA) and in partnership with the Direction General des Forêts de Tunisie (DGF) established a pilot site aimed at enhancing the productivity and resilience of the silvopastoral system. Sustainable practices, including reseeding with sulla (*Hedysarum coronarium*), have shown positive impacts on soil and water conservation, shrub regeneration, and livestock feeding costs (Figure 2).

**Figure 1.** Geographical location of the study area (Sbaihia) in the Zaghouan Governorate, Tunisia (SDAD 2018)

**Figure 2.** General view of the Sabihia site.

---

1 Schéma directeur d'aménagement et de développement du gouvernorat de Zaghouan. Phase 3: Stratégie d'aménagement et de développement du gouvernorat et plan-programme à l'horizon 2030 Tunisia 81–125
Reseeding plots demonstrated significant improvements in parameters like dry matter yield compared to conventional free-range practices. The achievements are closely linked to the effective implementation of well-designed silvopastoral systems, resulting in notable outcomes such as better forage availability, improved livestock productivity, diminished erosion, and enriched biodiversity (Figure 3). The site plays a pivotal role in advancing sustainable practices and showcasing substantial benefits for both the environment and the local community. Hence, the establishment of a well-managed Community-Based Organization (CBO) was found to be crucial for sustained success, ensuring the implementation of a management plan, sustainable site use, and community involvement. This collaborative approach, including controlled grazing agreements and a nominal grazing fee fosters trust and a sense of ownership, vital for the ongoing success of restoration efforts.

In Tunisia, the Groupement de Développement Agricole (GDA) serves as a democratically legitimized local structure of CBO, encompassing owners and users tasked with the state-managed administration of specific natural resources. This non-profit entity functions as a vital intermediary, fostering connections between the community and other stakeholders regarding governance, resource utilization, and management. Playing a pivotal role, GDAs bear the responsibility for overseeing certain natural resources, including water, forests, and pastures, against a framework of severe overexploitation made worse by the escalating impacts of climate change, posing the imminent threat of irreversible damage. Despite their crucial mandate, these groups face challenges. Members encounter difficulties navigating democratic consultation processes, and their technical and administrative skills remain constrained. The lack of a clear legal framework further compounds these obstacles. A well-organized and participatory management system, involving both men and women, is
crucial to tackle challenges and ensure effective governance of natural resources becomes apparent to address these challenges and facilitate the effective governance of natural resources.

To initiate the establishment of the GDA in the Sbaihia Site, a series of workshops has been implemented. The primary aim of these workshops has two aspects: firstly, to facilitate the smooth formation of the GDA, and secondly, to empower the local community with the essential knowledge relating to their rights and responsibilities in the legalised creation of this group.

These workshops are strategically designed to serve as a comprehensive guide for not only community members but also for policy makers and development agencies involved in the process. The principal goal is to provide a clear and holistic understanding of the procedures and steps involved in legally forming a GDA. The workshops serve as a platform for policymakers to communicate the regulatory landscape, ensuring that development agencies are well-informed about the legal aspects surrounding group formation.

The first workshop
On the pivotal day of June 20, 2023, an important and purpose-driven working session took place at the Forest Fire Protection Center in Zaghouan, Tunisia, attended by the Director General of the Regional Commission for Agricultural Development (CRDA). The workshop drew together representatives from different backgrounds, including the Direction Générale des Forêts (DGF), Rural Women Empowerment Department and ICARDA’s scientists. In addition, a delegation from the local silvopastoral community in Sbaihia provided a crucial voice to the proceedings, representing the essential principle of community involvement in decision-making processes.

The shared mission aimed to highlight the importance of the Sbaihia pilot site and showcase its potential success. The focal point of the discussion centered around the significance of initiating a new GDA in the silvopastoral site, explaining the strategic requirement of forming these collaborative agricultural groups. At the heart of the discourse lay the implementation of the pasture improvement program in the Shihada region throughout the upcoming 2023-2024 season.

Figure 4. Active collaborative discussions and contribute to the exchange of ideas and engagement of participants during the first workshop.
Workshop Proceedings

Mr. Faisal Qatta, the DG of CRDA, extended a warm and gracious welcome to all attendees, setting the tone for an important gathering. In his opening remarks, he highlighted the vital importance of the ongoing excellent experience in pasture improvement within the Shihada region. Mr. Qatta expressed a compelling vision, emphasizing the need for steadfast and collaborative efforts to advance and build upon this pioneering initiative.

Dr. Louhaichi, team leader of the Rangeland Ecology and Forages Unit at ICARDA, took the floor and delivered an overview that shed light on the important role of the International Center for Agricultural Research in Dry Areas (ICARDA). Dr. Louhaichi provided invaluable insights into ICARDA's overarching objectives and strategic interventions specifically tailored for dry and semi-arid regions. Drawing attention to the organization's successful track record in the restoration and management of degraded silvopastoral systems, he highlighted various development projects that have had a transformative impact on landscapes and communities (Figure 4).

Of particular note was the mention of the Sbaihia region in Zaghouan, where ICARDA's interventions have led to a conceptual shift. This region now stands as an exemplar, not only for Tunisia but also for the broader Middle East and North Africa. Dr. Louhaichi clearly demonstrated the substantial outcomes of ICARDA’s involvement, showcasing the region's journey from challenges to accomplishments in sustainable pasture improvement. The Sbaihia experience serves as a compelling model, demonstrating the potential for positive change and sustainable development in arid and semi-arid landscapes. Dr. Louhaichi's presentation deeply connected with the audience, introducing a sense of optimism and inspiration as the Shahda region initiates its own journey of pasture improvement.

The focus of attention then went to Mr. Jamal Kailene, the Director of Forest and Pastoral Development, who took the stage to deliver a presentation titled "Sustainable Rehabilitation of Forest Pastures to Enhance Ecological and Environmental Services in Tunisia." Mr. Kailene's presentation unfolded as a narrative, highlighting the significant progress made through a spectrum of activities within the above-mentioned region (Figure 5).

Figure 5. Mr. Kailene highlighting achievements in sustainable silvopastoral rehabilitation efforts.
In his presentation, Mr. Kailene highlighted the significant achievements made in the pursuit of sustainable forest pasture rehabilitation. He featured the core principles guiding these accomplishments, placing particular emphasis on ecological restoration and the conservation of the environment. The audience was guided through a exploration of the success stories and transformative impacts resulting from dedicated efforts in the specified region.

Mr. Kailan explained how sustainable rehabilitation not only brings back forest pastures but also improves the overall environment in Tunisia. He talked about creating a healthier environment where plants and animals can grow well, and ecosystems can flourish. This means making sure that the land is in good shape, supporting a variety of plants and animals, and maintaining a balance in nature.

As the session extended, Mr. Faisal Qatta and Dr. Mounir Louhaichi collectively conveyed a powerful message of collaboration, innovation, and the potential for positive transformation. Their insights set the stage for robust discussions, fostering an environment where stakeholders could collectively explore strategies to replicate and adapt the success witnessed in Sbaihia to the unique context of the Shahda region. This gathering stands as evidence of a commitment to shared knowledge, sustainable development, and the pursuit of excellence in agricultural practices.

Following the engaging discussions among the participants, several pivotal points emerged, enriching the collective understanding and laying the foundation for actionable insights. The following key topics were raised, capturing the varied concerns and considerations of the participants:

A) Intervention Approach in Improving Forest Pastures:

The discussions brought to light the critical need for a well-defined and comprehensive intervention approach in the ongoing efforts to improve forest pastures. Participants emphasized the importance of strategic planning, sustainable practices, and the incorporation of ecological restoration principles. The discussion highlighted the significance of adopting a holistic framework that not only rehabilitate forest pastures but also ensures their long-term sustainability and resilience.

B) Methods and Governance of Pasture Utilization:

Another significant point of discussion centered around the methods and governance structures related to pasture utilization. Participants recognized the need for robust frameworks that balance the economic benefits of pasture use with ecological sustainability. The conversation investigated the best practices for managing and regulating pasture resources, emphasizing the importance of community involvement and stakeholder collaboration in shaping effective governance models.

C) Current Illegal Status of the Women’s Agricultural group in Sbaihia:

A notable issue that emerged was the illegal status of the Women’s Agricultural Group in Sbaihia. Participants emphasized the urgency of addressing this concern, highlighting the pivotal role of proper financial records and accounting practices. The discussion underscored that without transparent financial management, the group’s legal standing will not be rectified, hindering its rightful recognition and impeding progress toward the empowerment of women in agriculture.
Following a dynamic exchange of ideas and insights, the session yielded rich recommendations that showed potential future success. These pivotal recommendations include a diverse range of considerations aimed at adopting sustainable development and holistic empowerment within the Shahda region:

1. **Development of a Comprehensive Program for Optimal Pasture Utilization:**

   Recognizing the importance of sustainable land use, participants advocated for the creation of a comprehensive program designed to optimize pasture utilization. This initiative aims to strike a balance between economic benefits and ecological sustainability.

2. **Establishment of GDA in the Shahda Region:**

   Participants proposed the deliberate establishment of GDA in the Shahda region. The objectives and activities of this group would be meticulously defined to complement the existing Women’s Group, ensuring synergy and avoiding any potential overlap. Mr. Faisal Qatta expressed total support, swiftly navigating through the legal procedures as soon as they are initiated. He emphasized the adherence to legal steps, underscoring the need to clarify each step to the local community. This approach is key to strengthening their capacity and providing them with all the necessary information to successfully form this GDA.

3. **Scheduling a Working Session on July 13, 2023:**

   To foster community engagement and inclusive decision-making, a working session involving the silvopastoral community of the Shahda region and all stakeholders has been scheduled for July 13, 2023. This collaborative effort aims to collectively establish a roadmap, reflecting the aspirations and needs of the local community.

4. **Conducting Specialized Training Courses for Pasture Restoration:**

   Recognizing the significance of knowledge transfer, participants recommended the implementation of specialized training courses for pasture restoration and improvement. These courses are designed to empower local communities with the skills and techniques required for sustainable land management. This initiative will be carried out in conjunction with the integration of Indigenous Silvopastoral Species.

5. **Promoting Local and Adaptive Plant Indigenous Silvopastoral Species:**

   In light of climate change, it was advised to promote the cultivation of local and adaptive Indigenous Silvopastoral Species. This forward-thinking approach acknowledges the dynamic environmental changes and seeks to adapt agricultural practices accordingly.

6. **Empowering the Local Community through Participatory Governance:**

   Participants emphasized the importance of participatory governance, advocating for the active engagement of the local community in decision-making processes—from planning to implementation and utilization. This approach ensures a sense of ownership and community-driven initiatives.

7. **Significance of Scientific Research in Assessing Environmental Impacts:**
Acknowledging the importance of evidence-based decision-making, there was emphasis on the significance of scientific research. Specifically, assessing environmental and productivity impacts arising from pasture improvements is crucial to inform and benefit all stakeholders.

8. Fostering Continuous Collaboration Between Institutions:

To ensure a consistent and synergistic approach, participants recommended fostering continuous collaboration between institutions and individuals involved in pastoral activities. This collaborative effort seeks to combine resources, expertise, and insights for the sustainable growth of the pastoral area.

At the conclusion of the workshop, Mr. Faisal Qatta expressed his gratitude to all participants for their dedicated efforts and the successful achievements accomplished. He emphasized the importance of sustaining momentum at the site, highlighting the need for ongoing collaboration to transform it into a beacon of success. Dr. Mounir extended his thanks to all participants and highlighted the pivotal role of collaboration among stakeholders in ensuring continued success. Additionally, Mr. Kailene conveyed his appreciation and underscored the importance of actively working on the formulation of the GDA, emphasizing the essential participation of local community members in the upcoming workshop.

In a collective confirmation, all participants assured their commitment to collaborative efforts and the dedicated actions of sustainable practices. They recognized that, through their combined dedication, they have planted the seeds of prosperity for the entire community, fostering a vision of enduring success in the Shahda region.

**Second workshop**

In an effort to enhance the governance of the silvopastoral site in Sbaihia, a workshop was convened during the second week of July. The participants included representatives from the local community, various policy makers, civil society, silvopastoral community and our key partner, the DGF. The primary objective of this workshop was to strengthen the capacity of local communities, establish a clear roadmap, and facilitate the legal formation of the GDA. This group is considered to act as a vital link between the community and other stakeholders, facilitating the governance of resource use and management. The workshop aimed to empower participants with the knowledge and tools necessary for effective and sustainable management of the silvopastoral site.
Workshop Proceedings
The workshop organized distinguished representatives from various entities, including the General Directorate of Forestry (GDF), the International Center for Agricultural Research in the Dry Areas (ICARDA), the Regional Commission for Agricultural Development (CRDA), the Department of Finance and Encouragements, and a representative from the local community in Sbaihia. Mr. Jamal Kailene, the Director of Forest and Pastoral Development, launched the session by extending a warm welcome to the participants and providing context to the discussions (Figure 6).

In his opening remarks, Mr. Kailan presented a comprehensive overview of the remarkable steps made in pasture improvement. The focus was on sustainable rehabilitation, including afforestation, planting forage shrubs, introducing Carob trees, and sowing sulla across an estimated area of 70 hectares. This significant initiative is designed to increase fodder availability for livestock breeders and is implemented in collaboration with the International Center for Agricultural Research in Dry Areas.

Mr. Kailan highlighted the pivotal role of partnership in this initiative. He emphasized the significance of collaborative efforts between the General Directorate of Forests, the Regional Commission for Agricultural Development (CRDA) in Zaghouan, and the local community of the Shahda region. This collaboration is instrumental in governing the sustainable utilization of the pastures, ensuring a balanced and mutually beneficial approach.

The platform was then opened to attendees to delve into collaborative strategies and partnerships, with a particular focus on the establishment of the GDA.

Figure 6. Engaged participants contributing valuable insights during the second workshop discussion.
Discussion Points

1) Introduction and Benefits of GDA:

The session commenced with an exploration of the introduction and benefits associated with GDA, explaining their objectives in the context of agricultural development.

2) Phases of Establishing the GDA:

Participants engaged in a discussion regarding the phased approach to establishing the GDA. A proposed working session among community was highlighted to define the intervention area, suggest a name for the GDA, and outline its activities. An essential consideration was to ensure these activities align harmoniously with those of the existing Women’s Development GDA in Wadi Sabahia.

3) Model Basic Regulations for GDA:

Considerations centered around formulating model regulations for the GDA, establishing a framework that aligns with best practices in the area, and ensures effective governance. The agreement reached was to establish one of the first Silvopastoral GDAs in the country.

4) Components of the File Required for Establishment:

The discussion extended to identifying the components essential for compiling a comprehensive file for the establishment of an agricultural development complex. The representative of the Department of Finance and Encouragements Mrs. Fawzia Al Ryes emphasized the importance of presenting this file to the appointed representative of the DGF and the technical departments of the CRDA in Zaghouan. Subsequently, the file would be forwarded to the Governor for review and approval (Figure 7).

Figure 7. Mrs. Fawzia Al Ryes explaining the legal steps necessary to initiate the Groupement de Développement Agricole (GDA).
5) General Founding Session of the GDA:

Following the extensive discussion, the participants unanimously agreed upon the following recommendations:

a) Formation of a Specialized GDA in Silvopastoral Systems, with 40 Percent Representation of Women:

A innovative decision was made to establish a GDA specializing in Agrosilvopastoral systems, ensuring inclusivity with a significant representation of 40 percent women. This pioneering GDA is one of the first of its kind in Tunisia.

b) Delegation of Two Representatives to Initiate the Establishment of the GDA:

In a practical move, two representatives from the Shahda region were delegated with the responsibility to kickstart the establishment of the GDA within the upcoming week.

c) Designation of Wednesday, July 19, 2023, as the Founding Date:

The participants collectively agreed to designate Wednesday, July 19, 2023, as the founding date for the GDA. On this day, the two representatives will accompany the appointed persons of the General Directorate of Forests and the technical departments of the Regional Agricultural Development Delegation in Zaghouan to compile and submit the necessary files to the regional authorities.

d) Implementation of Training Courses for GDA Members:

Recognizing the importance of capacity-building, the group recommended the implementation of training courses for the members of the complex. These courses are intended to equip participants with the requisite skills and knowledge for effective involvement in agricultural development initiatives.

e) Establishment of a Committee for the GDA:

To streamline operations and enhance organizational efficiency, the decision was made to establish a committee for the GDA. This committee will play a pivotal role in overseeing and guiding the GDA's activities.

Towards the conclusion, Mr. Kailene expressed his sincere gratitude to all participants for their valuable contributions and collaborative spirit. He emphasized the critical importance of close follow-up to ensure the effective implementation of all the recommendations. Mr. Kailene underscored the need for ongoing communication, cooperation, and proactive engagement among the stakeholders involved.

In his closing remarks, he highlighted the shared responsibility in turning the agreed-upon recommendations into tangible actions that positively impact the agricultural development initiatives in the Shahda region. The call for a close follow-up was not merely a formality but a commitment to collective success and sustained progress.

Mr. Kailene's encouragement for a determined approach resonated with the participants, adopting a sense of shared ownership and dedication to seeing through the projected goals. The emphasis on close follow-up serves as a catalyst for continuous collaboration, ensuring that the drive generated during the workshop translates into meaningful advancements and lasting positive change in the agricultural landscape of the Shahda region.
Conclusion

The journey towards sustainable silvopastoral development in the Shahda region has witnessed a significant steps forward, forced by the collaborative efforts and visionary commitment of diverse stakeholders. The workshops held on June 20, 2023, and in the second week of July stand as transformative milestones, shaping the narrative of the Shahda region’s silvopastoral systems.

The foundation of success lies in the recognition of silvopastoral systems as instrumental tools in enhancing land productivity and resilience, especially in the challenging context of dry areas. The integration of trees with forage and livestock not only ensures a diversified and stable production system but also secures the region against the difficulties of arid conditions. As discussed in the workshops, the positive impact of silvopastoral systems extends beyond economic benefits, encompassing environmental conservation, social well-being, and biodiversity.

The Sbaihia site, a lighthouse of sustainable practices, has been a living testament to the potential transformative power of silvopastoral systems. Initiatives such as reseeding with native forage legume, sulla, and collaborative efforts involving ICARDA, local authority and the DGF have showcased concrete benefits, from soil and water conservation to improved livestock productivity and enriched biodiversity.

However, the road to success is not without its challenges. The illegal status of the Women's Agricultural Group in Sbaihia highlighted the necessity to establish an active GDA in the area; however, it is imperative to make the local community aware of the process involved in forming such groups. The workshops' discussions, recommendations, and decisions reflect a concerted effort to navigate these challenges by promoting community engagement, ensuring legal compliance, and emphasizing participatory governance.

The commitment of the participants to practical steps highlights a shared vision for sustainable development in the Shahda region. The proposed comprehensive program for optimal pasture utilization, the establishment of the GDA, specialized training courses for pasture restoration, and the promotion of local and adaptive Indigenous Silvopastoral Species collectively form a roadmap for future success.

The emphasis on participatory governance, scientific research, and continuous collaboration between institutions reinforces the commitment to evidence-based decision-making and holistic development. The pivotal decision to designate Wednesday, July 19, 2023, as the founding date for the GDA is a significant step towards translating discussions into tangible actions.

As the participants expressed their gratitude and commitment, the workshops concluded with a resonating call for ongoing collaboration, vigilance, and proactive engagement. The importance of a close follow-up was not merely a procedural formality but a shared commitment to nurturing the seeds of prosperity planted in the Shahda region. The projected goals, from establishing the GDA to implementing training courses, now await the diligent efforts of all stakeholders to turn aspirations into enduring success.

In closing, the workshops have set the stage for a promising chapter in the agricultural development of the Shahda region. The collaborative spirit, dedication to sustainable practices, and the shared vision of prosperity bode well for the transformative journey that lies ahead. The Shahda region stands poised at the crossroads of progress, and with collective efforts, it is destined to blossom into a model of sustainable silvopastoral development, inspiring not only Tunisia but also regions facing similar challenges around the world.
List of Participants
Workshop on Participatory Governance of Silvopastoral Systems:
case study of Ouled Sbaiha, Zaghouan CRDA Zaghouan
20 June 2023
List of participants

<table>
<thead>
<tr>
<th>* *</th>
<th>التوقيع /Signature</th>
<th>البريد الإلكتروني / Email</th>
<th>المؤسسة /Institute</th>
<th>الاسم / Name</th>
<th>الرقم</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*By checking the box, I am granting the International Centre for Agricultural Research in the Dry Areas (ICARDA) to use, reuse, publish, and/or republish in whole or in part, in any medium (including the ICARDA website, social media, and publication) the photographs (individually or in a group in which I am included) of me that are taken during this field day without restrictions as to changes or alteration, as they are used in conjunction with the representation and promotion of the Centre. I understand that all such recordings, in whatever medium, shall remain solely the property of ICARDA, and I shall have no right or interest in them. I permit ICARDA and its authorized agents to use my image, name and/or business title, as they are used in conjunction with the representation and promotion of the ICARDA.
### Workshop on Participatory Governance of Silvopastoral Systems:
case study of Ouled Sbaiha, Zaghouan CRDA Zaghouan
13 July 2023
List of participants

<table>
<thead>
<tr>
<th>*</th>
<th>التوقيع /Signature</th>
<th>البريد الإلكتروني / Email</th>
<th>المؤسسة /Institute</th>
<th>الاسم / Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✅</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*By checking the box, I am granting the International Centre for Agricultural Research in the Dry Areas (ICARDA) to use, reuse, publish, and/or republish in whole or in part, in any medium (including the ICARDA website, social media, and publication) the photographs (individually or in a group in which I am included) of me that are taken during this field day without restrictions as to changes or alteration, as they are used in conjunction with the representation and promotion of the Centre. I understand that all such recordings, in whatever medium, shall remain solely the property of ICARDA, and I shall have no right or interest in them. I permit ICARDA and its authorized agents to use my image, name and/or business title, as they are used in conjunction with the representation and promotion of the ICARDA.*
## List of participants

<table>
<thead>
<tr>
<th>Signature</th>
<th>Email</th>
<th>Institute</th>
<th>Name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><a href="mailto:s.hassan@cgiar.org">s.hassan@cgiar.org</a></td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

*By checking the box, I am granting the International Centre for Agricultural Research in the Dry Areas (ICARDA) to use, reuse, publish, and/or republish in whole or in part, in any medium (including the ICARDA website, social media, and publication) the photographs (individually or in a group in which I am included) of me that are taken during this field day without restrictions as to changes or alteration, as they are used in conjunction with the representation and promotion of the Centre. I understand that all such recordings, in whatever medium, shall remain solely the property of ICARDA, and I shall have no right or interest in them. I permit ICARDA and its authorized agents to use my image, name and/or business title, as they are used in conjunction with the representation and promotion of the ICARDA.
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.

*This report was produced as part of the CGIAR initiative on Livestock and Climate which is supported by contributors to the CGIAR Trust Fund. [cgiar.org/funders]*

This document is licensed for use under the Creative Commons Attribution 4.0 International License July 2023.