Key constraints and opportunities for pastoral development projects engineering and rangeland governance in South Tunisia

Frija A., Sghaier Ma., Sghaier Mo., Dhehibi B., Fetoui M.

in

Capone R. (ed.), Bottalico F. (ed.), El Bilali H. (ed.), Ottomano Palmisano G. (ed.), Cardone G. (ed.), Acquafredda A. (ed.)
Pastoralism and sustainable development: proceedings

Bari : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens ;n. 126

2021
pages 239-249

Key constraints and opportunities for pastoral development projects engineering and rangeland governance in South Tunisia

Aymen Frija[1], Mariem Sghaier[1,2], Mongi Sghaier[2], Boubaker Dhehibi[1], Mondher Fetoui[2]

International Centre for Agricultural Research in the Dry Areas (ICARDA) – Tunis, Tunisia
Institut des Régions Arides (IRA) – Medenine, Tunisia

Abstract. Pastoral development projects engineering in Tunisia has encountered several problems due to the complexity of rangeland resources, territories, societies, and institutional settings. The aim of this paper is to depict some of the current constraints and opportunities faced by three pastoral investment project management units (PMU) in South Tunisia, while characterizing the wider impact of these projects on rangeland governance. We assessed three pastoral development projects in South Tunisia to appreciate their compliance with principle of enhanced development projects engineering including: i) relevance and coherence of the project; ii) effectiveness; iii) efficiency of implementation; and iv) impact orientation and sustainability. The data was gathered using an online questionnaire and focus group discussions with leaders of the three project PMUs. Results emerging from this research show that it is highly important to include infrastructure investments of the projects into a broader perspective of pastoral economic and territorial development. It is further important for pastoral development projects to invest in building enhanced social capital, networks and norms. The impact of the later investments will not be immediate but contributes to building long term resilience and sustainability.

Key words: Inclusive rangeland management, pastoral development, projects engineering, project management units, Southern Tunisia.

Résumé. *L'ingénierie des projets de développement pastoral en Tunisie a rencontré plusieurs problèmes dus à la complexité des ressources des parcours, des territoires, des sociétés et des cadres institutionnels. L'objectif de cet article est de dépeindre certaines des contraintes et opportunités actuelles auxquelles font face trois unités de gestion de projet (UGP) d'investissement pastoral dans le sud de la Tunisie, tout en caractérisant l'impact plus large de ces projets sur la gouvernance des parcours. Nous avons évalué trois projets de développement pastoral dans le Sud de la Tunisie afin d'apprécier leur conformité avec les principes améliorés de l'ingénierie des projets de développement, notamment : i) la pertinence et la cohérence du projet ; ii) l'efficacité ; iii) l'efficience de la mise en œuvre ; et iv) l'orientation et la durabilité de l'impact. Les données ont été recueillies à l'aide d'un questionnaire en ligne et de discussions de groupe avec les responsables des trois UGP du projet. Les résultats de cette recherche montrent qu'il est très important d'inclure les investissements en infrastructures des projets dans une perspective plus large de développement économique et territorial pastoral. Il est également important que les projets de développement pastoral investissent dans le renforcement du capital social, des réseaux et des normes. L'impact de ces derniers investissements ne sera pas immédiat mais contribuera à la construction d'une résilience et d'une durabilité des acquis du projet à long terme.*

Mots clés *: Gestion inclusive des parcours, développement pastoral, ingénierie de projet, unités de gestion de projet, sud de la Tunisie.*

I - Introduction

Governance refers to all the measures, rules, decision-making, information and monitoring bodies that ensure the proper functioning and control of a State, an institution or an organization that it is public or private, regional, national or international (FAO, 2007). Governance is further defined as "…the process of reconciling the priorities and competing interests of different groups". Governance involves formal and informal institutions and arrangements among

stakeholders". It considers the rules (laws and other norms), institutions and processes that determine interaction among and between actors (Herrera et al., 2014). Governing the commons refers to the capability of "community, group of communities or group of people to own, manage and/or use collectively natural resources in support of their food security, livelihoods, and well-being" (Davies et al., 2016). The concept of resource governance is thus highly intricated into larger social, institutional and economics systems, at different levels, with strong relationships and articulations between both resource and territorial concepts (Frija et al., 2019).

Tunisia is predominated by the semi-arid and arid climate on three quarters of its territory. Arid and desert regions occupy about 77.6% of the total area of the country (16,400,000 ha). Rangelands occupy 4.3 million ha, mostly in the arid zones (DGF & Banque Mondiale, 2015). About 14% of the country's population is living in forests or rangelands, most of these households are poor and depend on silvopastoral activities. Forests and rangelands provide 30 to 40% of the income of rural households, 15-25% of food needs for livestock, and 14% of household energy needs. They generate profits of around 1 billion TD per year, representing 14% of agricultural GDP and 1.3% of the country's GDP in 2012 (DGF & Banque Mondiale, 2015). Talking about rural development planning, programs and investments in these arid areas refers necessarily to socioeconomic activities based on arid farming and livestock grazing on common rangeland areas. Rural development programs in the pastoral areas need also to consider rangeland resources in the heart of their objectives and actions.

The Tunisian experience on rangeland and pastoral development during the four last decades shows that pastoral development projects engineering has encountered several problems due to the complexity of rangeland resources, territories, societies, and institutional settings. The performance of these projects has often been explained by the hostility of biophysical conditions, by the scarcity and vulnerability of natural resources and by socio-economic constraints. However, limited attention has been paid to aspects related to projects' engineering and management. Pastoral investment projects in Tunisia are usually divided into different components (each of them is further subdivided into different investment activities). These activities can be of different type ranging from investments in infrastructure to facilitate farmers' access to markets, investments in capacity building, investments in enabling environment for stimulating income generation activities, etc. Furthermore, pastoral investment projects in South Tunisia are also contributing to the restoration of large rangeland areas through different approaches (resting, seedling, reforestation, etc.). This is helping to generate more evidence about the positive impact of such restoration operations on rangeland biomass and incentivize the pastoral communities to further collaborate among themselves and with other actors for collective action and rangeland preservation. Despite their deep correlation, both concepts of rangeland governance and pastoral development investments are currently undertaken by research and development programs in a separate and fragmented way.

Within this framework, the aim of this paper is to depict some of the current constraints and opportunities faced by three pastoral investment project management units (PMU) in South Tunisia, while characterizing the way these projects are considering rangeland governance in their investments. We analyzed three pastoral development projects which are all funded by “International Fund of Agricultural Development” (IFAD) to enhance the pastoral development in South Tunisia (Tataouine, Medenine, and Kebili). The method was based on assessing the projects against four critical principles of development projects engineering including: i) relevance and coherence of the project; ii) effectiveness; iii) efficiency of the projects implementation; and iv) impact orientation and sustainability. The data was gathered using an online questionnaire and focus group discussions (reflecting in detail about the previous criteria and indicators) with leaders of the three project PMUs. The questionnaire included a mix of close ended and open questions to capture the opinions of different PMU leaders about current design, management and monitoring aspects related to pastoral development projects implementation in south Tunisia.

The remaining of this conference paper is divided into 4 sections. The next section is providing an overview of the evolution of pastoral policies and programs (large investment programs) in

the country, and the main achievement. Based on that, we present the paper methodology and results in the third and fourth sections. A last section concludes.

II - Overview of pastoral development programs in Tunisia

Since independence, 4 main periods have marked the evolution of Tunisian policy and experience in terms of rangeland and pastoral development. These are as follows (Abaab et al., 2020):

The period 1956-1970 did not consider the development of rangelands as a specific orientation but was integrated into the overall development policies of watersheds management to reduce water erosion. In this period, policies for the delimitation of the forest/rangeland area and clearance of pending tenure issues were implemented. This aimed at delimiting and clarifying the land tenure status to facilitate access to land for settlers and the sedentarisation and control of pastoral populations.

The period 1971-1989 consisted of the deployment of the policy of clearing collective land and the acceleration of its privatization process, upon their submission to the forestry regime (1974), and the promulgation of the forestry code in 1988. Early pastoral development projects were implemented in that period. These include the "Oglet Merteba" project in Menzel Habib (Governorate of Gabes) which is a pioneering example of rangeland rehabilitation and the fight against desertification in drylands. This project revealed the importance of the socio-economic factors and land tenure systems in the successful implementation of rangeland rehabilitation projects. This experience drew the attention of the public administration on the multidimensional and integrated dimensions of pastoral development which are needed to avoid contradictory actions such as the encouragement of olive plantations at the expense of rangelands. Early awareness about possible conflicts and harmonies between such pastoral territorial development and rangeland management started to arise in this period.

The period 1990-2011 was marked by a deliberate political priority for the development of rangelands and forests materialized by the implementation of two national programs and major pastoral development projects such as PRODESUD1 in the large area of rangelands of the governorate of Tataouine in the south of the country. The most important achievements of these development programs concerns (i) the development of the National Strategy for Reforestation, Water and Soil Conservation (CES) and the fight against desertification; (ii) the financing of forestry and rangeland projects with the support of donors; (iii) the development in 2007 of the national forest program (NFP); (iv) the formulation of an early national rangelands strategy; (v) the development of a national forest protection plan against fires; (vi) carrying out the first national forest and pastoral inventory (IFPN). Thus, the ten-year strategy 1990-2001 was implemented by the Forest Department (which was also mandated to manage rangelands). The second national development strategy for the forestry and pastoral sector (2002-2011) which was further implemented by the Forest department, consolidated the achievements of the first phase by integrating the interventions of other related technical public agencies such as the livestock department, the agency for territorial development of South Tunisia, the soil and water conservation administration, etc. We thus started to see integrated actions and programs, which are partly devoted to rangelands restoration, especially through integrated technical solutions. Both strategies resulted in 423,500 ha of improved rangelands (Abaab et al., 2020).

The post-revolution period (2011) has experienced profound changes where the forest and rangeland areas have suffered from serious infringements which deeply threatened their sustainability given the weakness of the executive state authorities. There was a consensus at that period about the emergency of investing in social, institutional and economic empowerment of local pastoral communities as key factors for the sustainability of resources and of the development programs. New pastoral investments projects have been designed and implemented with a strong focus on participation of local population in the community

[1] "Agropastoral Development and Local Initiatives Promotion Programme for the South-East", phase I (2004-2011)

development programs. Additional focus was lately made on integrating and developing value chains and income generating activities through these projects. Two of the most important projects are PRODESUD (phase II – 2012-2019), and the PRODEFIL[2] (2014-2023). More focus was made on territorial economic development of the pastoral areas through these projects. They also considered targeted investments in empowering rangeland farmers associations and building rangeland infrastructure for pastors. A focus was further made on agro-pastoral diversification (greenhouse vegetables, sheep fattening, etc.) and a cross value chain approach.

III - Conceptual framework and methodology

Pastoral investment projects are usually divided into different components (investments in infrastructure to facilitate farmers' access to markets, investments in capacity building, investments in enabling environment for stimulating income generation activities, capacity building, etc.). The structure of the investment portfolio of the pastoral development projects will re-define the way pastoral communities interact with their common resources and the focus they devote to access, usages, and management of these resources. The analytical framework of this paper is divided into two sequences: 1) identify gaps, constraints and opportunities in terms of pastoral development projects (against enhanced principles of development projects engineering) currently ongoing in Tunisia; and 2) look at how these projects are directly (or indirectly) investing in enhancing rangeland governance and provide, accordingly, recommendations for better inclusion of rangeland protection (and governance).

The methodology of the paper consists of cross comparing three of the largest pastoral development projects in Tunisia (PRODESUD II – Component of Tataouine, PRODESUD II – Component of Kebili, and PRODEFIL). Each of these projects is implemented in a different social and biophysical context and is lead by a different project management unit. This means that these projects have some common characteristics but are also facing different specific challenges in terms of territorial dynamics and needs. The earlier PRODESUD projects started using an approach of participative co-design of development actions and institutional empowerment of farmers associations. The PRODEFIL rather adopted an inclusive cross value chain development approach since its early conceptualization and design phase. These orientations are also partly induced by ongoing donors, approaches and external technical assistance. More description of the structural differences across these three projects will follow in the coming section. In this paper, we used a set of “project engineering indicators” related to the different phases of design phase, implementation, and monitoring, to compare these projects and thus derive gaps in terms of pastoral projects engineering. Figure 1 presents an illustration of the 4 project engineering principles used in this regard. A questionnaire was built based on these pillars and filled up by the leaders of the projects management units (PMU) to explore the gaps, constraints and opportunities faced by these projects. These aspects were also discussed in an open focus group discussion which gathered the leaders and co-leaders of each of these projects. Principles involved in figure 1 include i) relevance and coherence of the project (where the relevance assess the links between the objectives of the project activities and the identified needs); The coherence (is reflected through the existence of coherent linkages between the different components of the investment project); ii) effectiveness (as reflected by the relationship between the activity objectives and the results obtained); iii) efficiency (the relationship between the resources allocated to the activity and respective results) ; and iv) impact orientation and sustainability.

[2] *Le Projet de développement agro-pastoral et des filières associées dans le Gouvernorat de Médenine*

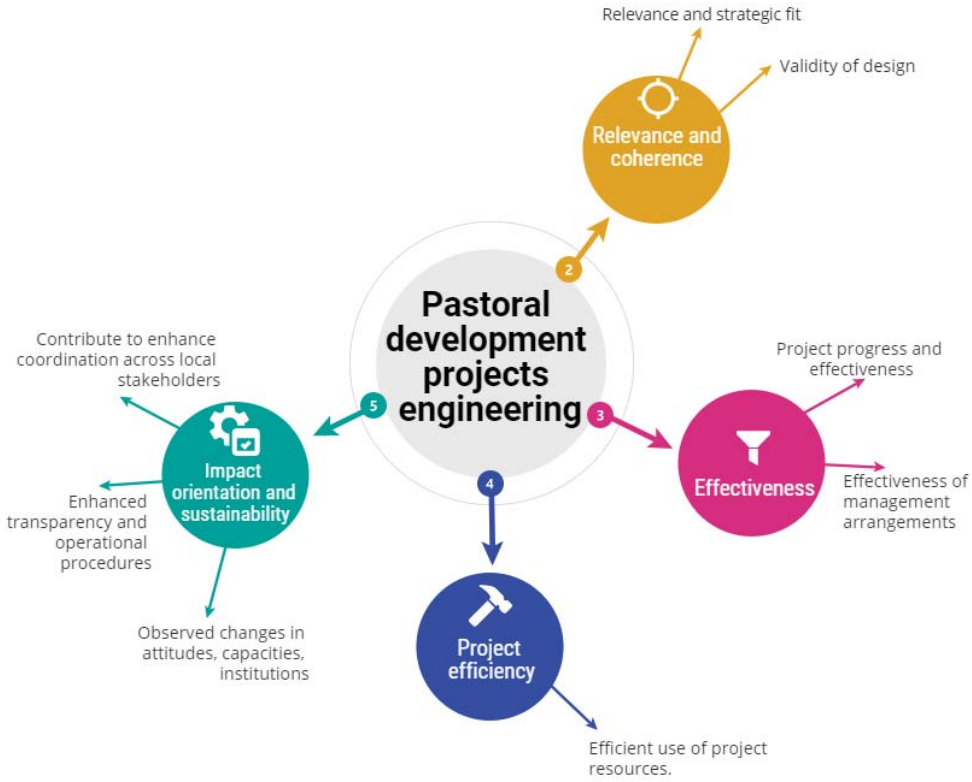

Figure 1. Basic principles for effective engineering of investment projects (Source: Own elaboration, 2021).

IV - Results: main recommendations for enhanced pastoral projects' engineering and rangeland governance

4.1 Characteristics of the considered pastoral development projects

The presentations of the three investment projects revealed many structural differences, yet some similarities ranging from the approaches used for projects implementation to the components and types of investment portfolios undertaken. While the three projects promoted and adopted a participatory and partnership approach centered on local community, the action plans and the institutional settings highlighted major differences across them. One of these major differences is the inclusion and the focus on value chains adopted by PRODEFIL project in Medenine governorate. There were also structural differences related to operational modalities used by these projects to align with national priorities and SDGs. In fact, while PRODEFIL is explicitly committed to deliver for SDG national commitments, the PRODESUD-K remains, for example, less explicit within these regards which means lower potential to map it to higher level national objectives. This fact combined with lower ownership and embeddedness of this project PMU into regional public administrations accentuate this feeling and further limit the project delivery in terms of development impact.

Table 1. Overall characteristics, objectives and cost structure of the selected pastoral development projects.

	PRODESUD-T	PRODESUD-K	PRODEFIL
Objectives	▪ Participative management of rangelands and water ▪ Livestock integration and valorization of territorial assets and services ▪ Gender and youth integration in economic and resources decisions	▪ Improve the productivity of rangelands ▪ Diversification of income activities and employment generation (especially for women and youth) ▪ Devotion of local development and resources management to local population	▪ Improve the overall welfare and livelihoods of local population, ▪ Improve the productivity of rangelands, agricultural systems and associated value chains. ▪ Capacity building and community-based organizations empowerment. ▪ Creation of income and employment opportunities.
Target beneficiaries	66,000 inhabitants; 9,000 households; 6,500 pastoralists.	600 households	15,000 livestock keepers; 19,000 farms; which refers to around 75,000 inhabitants (including 52% women)
Cost and duration	116 Mio TND – 15 years.	23 Mio TND – 7 years	73.9 Mio TND – 6 years
Investment structure	37.9% (of the budget) for system productivity and resilience; 39.6% for infrastructure investments; 6% to support income generating activities; 7.7 institutional and capacity building.	84.2% for systems productivity (including infrastructure investments) 5.35% for promoting income generating activities and other local economic initiatives; 6% institutional and capacity building	32% for systems productivity and resilience; 52.4% for value chain development (including targeted collective infrastructure); 15.6% for institutional and capacity building.
Affiliation and hierarchy of PMU	Embedded (but partly disconnected) into the regional agricultural administration (CRDA). Lack of human resources.	Affiliated to the CRDA but dealing with local administration as the project is focusing on Douz sub-district of Kebili. Lack of human and logistic resources	Strong hierarchy but lack of human resources. Embedded into CRDA of Medenine. Benefited from strong technical assistance to the PMU (EU grant)
Strongest achievements	Large rangeland areas restored (Rested) and change in communities' mindset towards higher acceptance of restoration. Creation, promotion and empowerment of large number of GDAs Wide intervention in terms of pastoral infrastructure (Wells, roads, etc.)	Large rangeland areas restored (Rested) Wide intervention in terms of pastoral infrastructure (Wells, roads, etc.) Improvement of vegetation cover.	High number of SME, SMSA and other forms if income generation for women and youth. Wide intervention in terms of pastoral infrastructure (Wells, roads, etc.) Experimentation of the cross associated value chains with territorial approach (Imada/versus UST)

Source: own elaboration based on focus groups discussions, 2020

Table 1 highlights the most important structural differences across projects, especially in the way the PMUs are embedded into the regional agricultural administrations (also called CRDA in Tunisia). This level of embeddedness would define the level of support the PMU receives from their "mother institutions" to support their various operations. This can be qualified as an important criterion when dealing with other non-agricultural regional administrations for implementing some of the investment activities. Low level of embeddedness is particularly observed for the case of PRODESUD-K as this project is rather focusing on a sub-district and thus dealing with local (rather than regional) agricultural administrations.
The PRODEFIL project has a larger share of its budget devoted to promoting associated value chains, SME's (Small and Medium Enterprises) promotion and income generation investments. This helped the project to even target their collective infrastructure investments to support the good structuring of the local livestock (and other) and local resources valorization value chains. The achievements of this project in terms of number of SME and SMSA (Société Mutuelle de Service Agricole, cooperative) created are beyond the target. It is also important to refer here to the fact that a sub-directorate dealing with value chains development (partly embedded/hosted at the CRDA) was also supporting the project. A similar lesson can be drawn from the PRODESUD-T project where most of the infrastructure investments were undertaken in the framework of the larger component of rangeland restoration (resting), where the success and achievements were very satisfying. A first remark is that investments in infrastructure are usually the largest components of these projects and are related to the overall development-oriented of these projects.

4.2 Constraints and opportunities for enhanced engineering of the pastoral investment projects

The studied projects revealed some good opportunities and highlighted other constraints facing the PMUs responsible for the implementation of different projects' components. From a development engineering perspective, these opportunities and constraints are linked to the four main performance components previously listed. The first principle regarding the relevance of the projects can be discussed from many perspectives (relevance to whom, at which stage of the project implementation, etc.). In fact, all projects started with a participatory demand assessment analysis carried out at the beginning of the project to reflect about the various needs of different stakeholders. Results of the survey reveal that projects design (components and activities portfolio) was based on these assessments, and further affected by the management approach suggested by the donor (IFAD). It is also suggested that objectives and results of the projects are aligned to the real needs of the local population. However, there is sometimes a lack of coherence across the different projects' activities for some projects (such as PRODESUD-K).

Table 2. Main projects engineering constraints and opportunities for the three pastoral development projects.

Project name	Project engineering Constraints	Project engineering opportunities
PRODESUD II – Tataouine	▪ Land tenure system is highly problematic for the success of some investments. ▪ Difficulty to design activities which satisfies all beneficiaries which do sometimes have conflictual interests. ▪ Lack of activities which aims at enhancing the enabling institutional environment (policy dialogues etc.) ▪ Lack of advanced monitoring and evaluation systems which provides feedback for adjusting the project interventions.	▪ Long term collaboration through the different project phases enhanced mutual trust and the acceptance of project approaches. ▪ Strong technical partnership with other technical partners which helped achieving high areas of restored rangelands. ▪ The project generated evidence about benefits for rangeland restoration (resting) which further enhanced communities' acceptance and ownership of these investments
PRODESUD II – Kebili	▪ Moderate engagement of national partners in terms of mandate, influence, capacities, etc. ▪ Lack of coherence of some of the project components/activities. ▪ Lack of appropriate indicators to monitor the progress of the project. ▪ Lack of resources (human) and technical backstopping for implementation of a wide range of investments. ▪ Only a low share of investment is devoted to income generating activities and to farmers' subsidy against rangeland fencing. ▪ The scale of intervention is large compared to the resources available (probably need to rethink/fit the geographical scale).	▪ Benefited from strong support from GDAs and local societies. ▪ Strong impact of capacity development investments for GDA despite their limited number.
PRODEFIL– Medenine	▪ The high number of beneficiaries through the VC, lack of time to change the mindset of different VC actors reduced the success of achieving structural changes for key VCs relevant to the region. ▪ Some communication problems with some GDAs and local community in some areas (mainly in Bengardane) have led to misunderstanding and then slowing down of the implementation rate of project actions and blocking others such as the resting technique. ▪ The delay of value chain infrastructure investments	▪ Elaboration and data collection for gender sensitive monitoring indicators is feasible and extremely helpful for project evaluation and decision making. ▪ Strong achievements in terms of rangeland governance and income generating activities. ▪ Project design enhanced the closeness of the project to the community of the area of intervention. ▪ Project design flexibility (the project was able to take appropriate arrangements (investment or other) according to specific needs / situations.

Common to All	▪ The available financial and human resources are not well embedded and sufficient to achieve projects objectives. ▪ Lack of gender analysis prior to the starting of the project. ▪ Moderate use (and transformation) of project outputs (so far) by the project partners ▪ Projects implementation didn't lead to a change in national (and partners) priorities by inducing a favorable enabling environment capitalizing on the different success. ▪ The project relies on arrangements with GDA and LMCs which is not sufficiently representative of the interests of the whole population. ▪ The legal financial restrictions influenced the delivery of activities in a timely manner	▪ Strong involvement of national partners in the different steps of project design, implementation and evaluation, which stress the participative aspect of the projects. ▪ Strong impact of investments in institutional and capacity development (especially GDAs) ▪ Impact on the communication process between different stakeholders (or at least an initiation of the process)

Source: own elaboration based on focus groups discussions, 2020

it has been revealed from this comparative analysis that some common constraints for the good engineering of pastoral development projects do exist across the three studied projects and may threaten the sustainability of the projects' investments. An overall summary structuring the findings in table 2 according to the projects engineering principles previously stated is as follows:

- There is a strong need to better define the appropriate governance organization and hierarchy of PMUs and strengthen their position (embeddedness) within their mother administrations. This will support the legitimacy of the whole investment portfolio and strengthen the project ownership and impact.
- It is highly important to include infrastructure investments into a broader perspective of pastoral development, depending on the specific objectives and main focus of the projects. This will enhance the effectiveness and achievement.
- The analysis reflects about the importance of adequacy between means and resources (especially human and physical capitals) allocated and projects objectives, which may enhance the overall projects effectiveness.
- In the same line, there is a need for enhanced administrative settings and handholding of the project's PMUs (through trainings, technical assistance, etc.).
- The same highlights are also relevant to enhance projects efficiency as this is also related to the available means and resources in relation to achieved results.
- In terms of pertinence and adequacy, it is important for pastoral projects to effectively investigate the real needs of local populations through in-depth participatory development diagnostics, which should be implemented prior to the development of the log frames of these investments. Pastoral development projects should be fully integrated within the territory development strategies (e.g., territorial planning and regional and local development plans).
- Finally, pastoral investment projects can further enhance their impact orientation and sustainability by being inclusive and investing in building enhanced social capital, networks and norms. The impact of such investments will not be immediate but will certainly contribute to building long term resilience and project sustainability.

4.3 Projects investments in rangeland governance

Pastoral development projects are designed for communities living and using rangelands. Project outcomes in terms of enhanced rangeland management, governance, and sustainability are thus primary. While all projects' activities have been designed and implemented to fit the pastoral community's needs, some activities had however stronger direct and indirect impact on rangelands. There can be listed as below:

- Subsidies in terms of additional feed resources against resting their collective rangelands. This has strongly contributed to change the mindset of pastoralists, especially during rainy years where the biomass production of rangelands increased tremendously, and early signs of ecological recovery appeared.
- Targeted investments in rural infrastructure which can help guiding the mobility of pastoral farmers and reducing its transportation costs.
- Investments in enhancing the technical skills of partners assisting with the implementation of rangeland resting. This was a key element of success.
- Investments in enhancing/upgrading the capacities of pastoral farmers associations, which in some cases highly contributed to the success of local restoration programs implemented by these associations.
- Investments in pastoral plantations and reseeding of some rangeland areas (not significant for the three projects).
- Income generating activities are positive drivers of local development but not enough for reducing significant pressure on rangelands.

The positive impact of many of these investments on rangeland governance was confirmed by studies undertaken by the IRA-ICARDA team about the importance of upgrading GDAs who are key institutions for rangeland governance (Frija et al. 2021; Fetoui et al., 2020). Particularly, enhancing the internal organization of GDAs, their capacity to raise funds and implement collective projects, and the social acceptance of the GDA president are key drivers of farmers' participation to rangeland restoration. The results also confirm the importance of responding to the need of local populations in terms of economic diversification through wider alternatives of income generation activities, employment, and enterprising (Frija et al. 2021).

V - Conclusions

The analysis of pastoral development/investment projects engineering in South Tunisia revealed many interesting lessons which can be taken into consideration for future national debates. While there are common lessons and similarity across the three considered projects, contextuality and specificities of each of these projects remains to be considered. Results emerging from this research show that it is highly important to include infrastructure investments into a broader perspective of pastoral socioecological and territorial development, depending on the specific objectives and the purpose expected from these projects. These suggest that opportunities exist to enhance the effectiveness and achievement initially planned by the projects. In terms of pertinence and adequacy, it is important for pastoral projects to effectively investigate the real needs of local populations through in-depth participatory development diagnostics and consultations, which recommended to be implemented prior to the development of the log frames of these investments. It is imperative that pastoral development projects should be fully integrated within the territory development strategies (e.g., territorial planning and regional and local development plans). Finally, pastoral investment projects can further enhance their impact orientation and sustainability by being more inclusive and becoming increasingly apparent that investing in building enhanced social capital, networks and norms. The impact of such investments will not be immediate but will certainly make an effective contribution to long term sustainability and led to a new socio-ecological impact strategy.

Acknowledgement

This work is carried out as part of research collaboration agreement between ICARDA and IRA de Médenine, Tunisia. It is undertaken in the framework of the CGIAR Consortium Research Program (CRP) on Livestock (Flagship 4 on Livestock & Environment) and the CRP-Policies Institutions & Markets (PIM), under Flagship 5, led by the International Food Policy Research Institute and implemented by ICARDA in Tunisia. Authors express their acknowledgement to the managers of the three CRDAs (Tataouine, Kebili and Medenine) and to the staff of the three pastoral development projects (PRODESUD, Tataouine and Kebili; PRODEFIL in Medenine) for their kind collaboration during the discussions and the data collection.

References

Abaab Ali, Mohamed Neffati, Mongi Sghaier, Touhami Khorchani, Ali Nefzaoui, Aymen Frija, Salma Jalouali, Zine Elabidine Ghoudi, 2020. Synthèse des principaux acquis de l'expérience tunisienne en matière du développement des territoires pastoraux, Revue des Régions Arides- Numéro Spécial- n°47 (2/2020) ; IRA de Medenine, Medenine, Tunisia.

Davies J., Herrera P., Ruiz-Mirazo J., Mohamed-Katerere J., Hannam I, Nuesri E. 2016. Improving governance of pastoral lands Implementing the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security. Governance of tenure technical guide No. 6. FAO, 138 p.

DGF & Banque Mondiale, 2015. Vers une gestion durable des écosystèmes forestiers et pastoraux en Tunisie. Analyse des bénéfices et des coûts de la dégradation des forêts et parcours. Etude a été réalisée par Lelia et Hamed Daly sous la supervision de Taoufiq Bennouna et Youssef Saadani. 101 p.DGF &

FAO. 2017. Valuing land tenure rights. A technical guide on valuing land tenure rights in line with the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security. ISBN 978-92-5-130069-5. 110 pages.

Fetoui M., Frija A., Dhehibi B., Sghaier M., Sghaier M. 2020. Analysis of stakeholders' strategies for rangeland resting under public and private tenure systems in Tataouine South Tunisia. Rangeland Ecology & Management, Vol 74, P 9-20.

Frija A., Sghaier M., Dhehibi B., Fetoui M. 2019. Frameworks, tools, and approaches for the assessment of rangeland governance. ICARDA guidelines and Manuals. https://hdl.handle.net/20.500.11766/10081

Frija A., Dhehibi B., Sghaier M., Fetoui M., Sghaier M. 2021. Towards Sustainable Rangeland Management and Strengthened Governance in South Tunisia. ICARDA Policy Brief. Lebanon: International Center for Agricultural Research in the Dry Areas (ICARDA).

Herrera P., Davies J., & Manzano Baena P., 2014. Principles of pastoralists governance and land management. In Herrera P., Davies J., & Manzano Baena P. (eds), 2014. The Governance of Rangelands: Collective Action for Sustainable Pastoralism. IUCN, ISBN = 978-1138785144. 1-31 pp.