



*PASTINNOVA – Innovative models for sustainable
future of Mediterranean pastoral systems*

**Deliverable Title: “Living Lab” on public policies and development strategies
to be implemented in Algeria**

Agropastoralism on the High Plains of the Sétif region

Contributions from the meeting - debate of November 6th at INRAA in Sétif

Responsible partners: INRAE- INRAA -Coopssel

Date: 25/11/2024

Version: Draft/Final



DOCUMENT INFORMATION

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<i>Date of delivery</i>	<i>11/25/2024</i>

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The prices quoted in this report are expressed in Algerian Dinars and converted into € at the official rate of the day of 0.0069 €/DA

The principle and objective of the Living Lab is to bring out credible proposals for agro-pastoral revival in the Sétif region based on a documented exchange between the various stakeholders in livestock farming in the region. Before reporting on the various points discussed during this day, it is useful to recall the characteristics and situation of agro-pastoral activities in the region and the diversity of pastoral forms in Algeria.

Evolution of agropastoralism in the Sétif region and trends in animal production

As in other North African countries, traditional pastoral lifestyles and activities were based on the judicious exploitation of a diversity of territories and resources through the mobility and nomadism of herds. They were dominant until the colonization of the country by the French who gradually destroyed or modified most of their characteristics by for example prohibiting access of nomadic herds from the southern steppes to the agricultural lands of the north (common pasture on stubble) in the north, appropriated by the colonists in addition to the

disruptive conditions of the war of independence and more recent political events. At independence, pastoral development policies and political choices were mainly based on modernist paradigms, ignoring the logic of traditional practices and the reality of power relations and local organizations. Initially, the government encouraged the reconstitution of the national herd, its concentration in the hands of a minority of commercial and permanently sedentary breeders, which led to an overpopulation of pastures and a dualism between these systems and the "traditional" pastoral systems. Imported feed was largely subsidized and the contribution of pastures to covering the needs of the livestock decreased considerably (less than 20% for example for sheep). Another consequence was the regression of collective organizations and rules, concomitant with the development of individualism and sedentarization.

Pastoralism in Algeria is very diverse. We can distinguish 4 main types: pastoralism based on grazing natural meadows in the far northeast of the country, agro-pastoralism in the high subhumid plains, steppe pastoralism in semi-arid areas and Saharan pastoralism in arid and desert areas dominated by camel breeding.

Concerning agro-pastoralism in subhumid areas, as in the Sétif region, new forms of animal production systems have emerged that have profoundly modified its footprint.

Dairy cattle breeding, favored by national policy, has developed strongly with either a significant reduction in the pastoral components of the system limited to increasingly reduced seasonal grazing due to the fragmentation of the plot and a reduction in pastoral areas, or a completely off-ground orientation. In all cases, a strong dependence on feed distributed at the trough often purchased (hay, silage, and supplements often in complete ration). We are dealing here with intensive or semi-intensive systems.

In addition, a large number of dairy farmers always have a flock of medium-sized sheep (60% of them have between 40 and 60 ewes, 30% less than 30, and 10% more than 60 to more than 600 ewes). These farmers also have variable areas in cereals. Their sheep graze on annual fallow land in autumn and spring as well as on communal rangelands mainly in spring, green barley plots in autumn as well as stubble after the harvest during the summer season. They also receive concentrated feed (4500 DA - €31/q.). Many farmers also only have a flock of sheep - goats. Agropastoralism in the subhumid areas of northern Algeria therefore mainly concerns sheep and goat farming. Due to a lack of motivation among breeders, climate change and the reduction in agricultural areas and competition from heavily subsidised speculation (wheat, milk), this agro-pastoralism is in decline while demand for sheep meat is increasing and prices are high (offset by imports and fattening at the trough). The reflection on improving agropastoralism in the high plains aims precisely to respond to its recovery challenges.

The El Anfel Multipurpose Agricultural Cooperative (formerly Coopssel): An integrating function as a breeding ground for innovation

Initially, COOPSEL was created in 1980 to ensure the supply of production resources essential to the agricultural and livestock activities provided for in the PNDA. After several changes of status, it became the multipurpose cooperative "El Anfel" in 2020. It has 1,330 members but also works with non-member breeders. COOPSEL has focused on milk production and collects 19 million liters of milk from 700 producers of varying sizes (some units have up to 300 heads). The challenge is to produce quality fresh thermized milk capable of competing with reconstituted milk from powdered milk produced by the central dairy, as well as Lben, but also to diversify, for example, with the manufacture of cheese (uncooked pressed cheese, Gouda type). The price paid to the producer is 60 DA per litre (0.4€/l) variable by 5 DA/l depending on the quality of the milk.



Picture n°1 : The entrance of the cooperative with his President and the cheese manufacturer manager



Picture n°2 : The manufacturer workshop



Picture n°3 : Some diversified products

COOPSEL has developed a significant expertise in animal production thanks to a long-term team of 90 motivated and involved people and several innovative initiatives in addition to the dairy:

-A complete MASH feed production unit (300 qx/day)



- The “Aïn Lahdjar” school farm with 150 VL, 80 heifers, a germinator for producing hydroponic barley of 20 qx/day and a cheese dairy with a processing capacity of 2000 l/day

Coopssel has succeeded so far thanks to the creation of a close-knit team based on detachment, humility, understanding and knowledge according to the principles of its founder, Kharshi Muhammad Al-Hawas.



Picture n° 4 : The buildings of the « Aïn Lahdjar » farm before its re establishment

Although its activity was not initially oriented towards pastoral farming, COOPSEL is now developing a strategy to revive pastoralism based on its experience and know-how to ensure a future for member farmers and to face the challenges they encounter.



Pictures n°5 et 6 : Ripening and Stocking rooms for the cheeses

Coopssel has greatly developed the dairy sector, but to promote its activity, they have adopted a new vision for guaranteeing sustainability, which implies support for all sectors while promoting systems that guarantee this sustainability, in particular the pastoral system (pathways, selection, innovation, training). Coopssel has thus created a group of around twenty shepherds to develop their activity, intended to become a real agro-pastoral

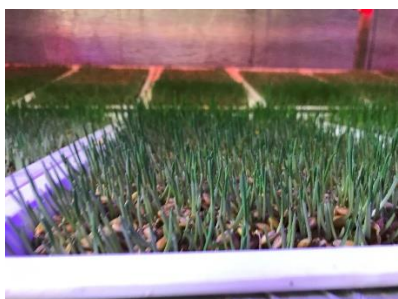
association. The farm school is a very relevant tool for developing innovations that can also be disseminated to pastoral farmers:

- Installation of natural windbreak hedges (alfalfa trees, acacia and Atriplex species).
- Development of hydroponic barley crops (see below)

A technical innovation useful for the revival of agropastoralism: hydroponic barley cultivation.

Hydroponic production of germinated barley provides green fodder with 20% dry matter and 0.8UFL/kg that is highly assimilable and effective for feeding ruminants. If hydroponic barley is included in the complete ration of dairy cows, it can be easily produced and distributed to sheep.

The different steps of hydroponic barley production:



This is barley soaked for one hour in a sanitized solution of water at 20 degrees. Germination occurs under red and blue light for 24 hours and then develops for 7 days with drip irrigation (1 mm/day) with air mixing by extractor and fan. 1 kg of dry barley thus produces 7 kg of green plant matter. The process is carried out automatically in an insulated building (3 million DA). Barley costs 4500 DA/q. The other operations have a negligible cost.



Visit to two agro-pastoral farms in Djemila

The Algerian agro-pastoral system is illustrated by the presentation of two livestock farms in a douar in the commune of Djemila, 45 km northeast of Sétif in a hilly region. The two young livestock farmers introduce us to their community and their herd. The douar brings together an extended family within which there is strong solidarity. The douar is represented by an elected official on the communal council of the commune of Djemila. Thus, the two livestock farmers are themselves cousins and the brother of one of them is the representative of the douar. In addition to the livestock farming activity, one of the two livestock farmers is a horse dealer in the surrounding souks.

The two livestock farms consist of two herds of 40 and 30 sheep respectively with a few goats from local populations or the Shammy breed. The goats are milked for family consumption of milk. The goats are also used to guide the rest of the herd. One of the herds is of the more productive Ouldjedal breed of the plains, the other herd of the more rustic Berber breed. The two farms have 5 and 3 ha of cereals respectively but also have access to the communal rangelands above the douar. One of the breeders also has a small chicken workshop.

The Ouldjedal breed herd



The Berber breed herd



Location of the farms



Discussion with a breeder



A view of rangelands



The ewes have a purchase value of around 130,000 (€900) each and lambs over 6 months old are sold for 8,000 DA (€550). They do not own a tractor but rent one for cereal sowing operations.

These farms are characteristic of the agro-pastoral systems of this region of Algeria. The herds graze the rangelands in the spring as well as green cereals and on stubble after the harvest. A shepherd on the rangelands is essential due to the presence of wolves. Barley is purchased for 4,500 DA per quintal by the farmer who does not benefit from aid from the CCLS (only 14 municipalities benefit from this support). The farmers would like to benefit from aid to expand their herd. They currently receive no support. They are also members of the local agricultural mutual fund.

Report of the plenary meeting of stakeholders on pastoralism policies and concluding proposals

The meeting at COOPSEL, at the school farm and then the visit to the two farms are fully part of the “Living Lab” approach through the ideas that emerged from the discussions they generated. The plenary meeting allowed all the parties present to express their point of view. After a presentation by Jean-Paul Dubeuf of the White Paper approach on Mediterranean pastoralism implemented within the framework of Pastinnova, Khaled Abbas recalled the objective of the meeting which is to bring out how in Algeria and in the face of the challenges of global change, public policies can take into account pastoral issues and encourage a revival of pastoralism and more particularly of agro-pastoralism in the Algerian High Plains. To document and support the debate between the different stakeholders, representing the different bodies of political orientation and decision-making. Khaled Abbas first recalls that the different phases of agricultural policy in Algeria since independence all had the objective of improving agricultural productivity, food and social security (see Appendix 1). The sector approach is always preferred by politicians because it allows them to rely on clear numerical indicators. He then calls for a new complementary and transversal vision that takes into account the issues of sustainability and biodiversity, which is integrated into state policy without abandoning production priorities, for example by promoting local products. When we talk about pastoralism in Algeria, we often talk first about pastoralism on the steppe in semi-arid and arid areas, which concerns a vast territory but which has experienced a sharp decline. As stated in the introduction, and without losing sight of the challenges of steppe pastoralism,

pastoralism in Algeria is also agro-pastoralism or sylvopastoralism in the high sub-humid plains as in the region of Sétif for which the mobility of herds is less important. This agro-pastoralism is based on the grazing of rangelands, fallow land and temporary grazed meadows. Khaled Abbas also recalls that two interconnected innovations (Innovation Business Models) were selected within the framework of PASTINNOVA:

- *Hydroponic agriculture*: production of green fodder from germinated barley using a simple and inexpensive device developed in dairy production, dissemination and training for agropastoral sheep farmers
- *The creation of an agro-pastoral group* of around twenty agro-pastoral breeders by COOPSEL for their training and technical supervision in terms of use of the rangelands and promotion of the products

Rachida Amri (DSA) then presents the main measures taken which concern pastoralism and in particular (see appendix no. 2)

- The 1975 pastoral law, which contains a large number of very relevant articles and provisions but which has not been really implemented or applied. However, it constitutes an administrative base on which we can rely for the future.
- The 1984 forestry law
- The repeal of the Azara system which encouraged the indebtedness of small farmers in an unfair manner
- The 2008 agricultural orientation law which encouraged the elimination of the axe; its articles 14/07 and 14/08 relating to the preservation of biological resources and social support measures to support farmers (rural housing, subsidies for animal and human food)
- The establishment of the National Agricultural Development Fund in 2014,
- The milk subsidy system
- Protection of the pastoral ecosystem
- Support for professional agricultural organizations. Throughout this period, Algeria created or supported a large number of institutions, technical institutes or systems likely to contribute to pastoralism.

Then Whalida Riahii presents in detail the measures relating to the protection of the forest (see appendix no. 3)

The Algerian forest is a public forest. The forest law of 23/11/2023 provides for the reforestation of many areas and in particular the steppe. It contains at least 4 articles in favor of pastoralism considered as a form of valorization of the forest. Several articles, in particular articles 76 and 77, specify the restrictions on grazing under forest (for reforestation, degraded areas, protected areas, areas subject to fire, etc.) and the methods of administrative control and possible sanctions. By this law, recent and not yet implemented, breeders are supposed to be subject to fees (25,000 to 35,000 DA)

Amal Djaout, INRAA then presents the importance of training breeders to enable quality pastoralism to improve control of animal health, reproduction, and the development of rangelands (see appendix no. 4). She recalls in this regard that "*without shepherds there is no*

herd" (Russian proverb). New digital technologies must make it possible to offer new tools and new methods. Several speakers react to point out that there are already training systems but that the demand for pastoralism professions remains very low or even non-existent.

From these presentations, a shared diagnosis emerges that Algeria offers a coherent political framework. This framework has focused on the country's food security and social support for the populations. At the same time, many laws, declarations, institutions consider that today pastoralism is important to address the country's environmental and climatic challenges.

But at the same time, pastoralism is in sharp decline, including agropastoralism as in the region of Sétif. Farmers are increasingly turning to dairy farming, often practically off-ground, and are abandoning sheep farming, which is the animal supporting agropastoralism, while prices and demand for sheep meat are at their highest.

This is why the group, with its varied skills has a legitimacy from an institutional point of view and through its knowledge of the situation, suggests proposals so that beyond major measures and declarations, agro-pastoralism can be given priority in the same way as food security and social priority. It thus proposes that a medium-term strategy with precise objectives over 10 or 20 years be developed that mobilizes real political engineering. It will particularly concern the training of breeders, which must be central to this strategy with a communication plan to change farmers' perception of pastoralism by giving a large place to innovation, or even support for installations. These discussions could allow, following the publication of the white paper on Mediterranean pastoralism, to produce a version adapted to pastoral policy in Algeria based on the example of Sétif.

Appendix n°1 - pastoral policy in Algeria: overview of the legal framework and sustainable development strategies

Khaled Abbas

The question of whether we can speak of a genuine pastoral policy in Algeria is complex and requires consideration of recent developments in the agricultural and forestry sectors. Although initiatives and reforms have been put in place to regulate pastoralism, they are often part of broader rural development, agricultural, or forest management policies, rather than a specific and distinct pastoral policy. Here is an analysis in light of developments in the agricultural sector

Background and Importance of Pastoralism

- Pastoralism is a key economic pillar, especially in the steppe and Saharan areas of Algeria. It provides employment and food security to local communities while contributing to biodiversity.
- About 80% of pastoral lands are in drylands.
- These rangelands are home to biodiversity what is crucial for ecological balance.

Legal Framework - The Pastoral Code

The Pastoral Code is a central element (1975) of the legal framework for regulating pastoral activities in Algeria. This code aims to ensure sustainable management of pastoral rangelands in steppe and Saharan areas, and to organize land use by pastoral communities. The code specifies access rights to pastoral lands, grazing rights, and the regulation of herd mobility. It protects pastoral areas against overexploitation, desertification, and competition with other land uses, such as intensive agriculture. This code was designed as part of the second phase of the agrarian revolution, itself designed around pastoral cooperatives that were later dissolved.

Although the Pastoral Code has a crucial role, its application remains a challenge, particularly due to the lack of strong implementation mechanisms at local and regional levels and the absence of pastoral cooperatives.

Agricultural and Rural Renewal Policy (PRAR)

Objectives of the PRAR in favor of pastoralism:

- Rehabilitating of steppe and Saharan rangelands.
- Support for livestock infrastructure and aid for sustainable productivity.
- Water resource management for rangelands.
- Obstacles : Institutional coordination and limited resources.

Investments have served agricultural activities instead of pastoralism

APFA Law and Access to Land Property

The law No. 87-19 provides access to property for breeders:

- Objective: Promote land security for breeders.
- Limitations: Settling reduces pastoral mobility.
- Challenges: Preserving ecosystems in the face of fragmentation.

The Forest Law of December 2023

1. Strengthening the Protection and Conservation of Forests and Rangelands
2. Sustainable Management and Development of Forest and Pastoral Resources:
3. Regulatory Framework for Pastoralism
4. Measures for the Rehabilitation of Pastoral Lands
5. Provisions Relating to the Fight against Desertification and Climate Change
6. Strengthened sanctions and regulations.

Role of Key Institutions.

Several institutions collaborate in supporting pastoralism:

- - MADR and DGF: Supervision of agricultural policies and forest rangelands.
- - HCDS: Development of steppe areas and sustainable management.
- - INRAA, CRSTRA, ITDAS, schools, universities, professional training institutes: Research and development of techniques for the resilience of pastoral practices.

Development Strategies and Programs

The main strategies to support sustainable pastoralism are under the aegis of the HCDS and forests.

The agricultural subsidy policy primarily supports strategic crops, Subsidies are intended for dairy cattle farmers while other aid affects small farmers as part of rural development and many of whose measures are part of the country's social policy.

Development strategies advocated by the HCDS include:

- Planting fodder shrubs for resilience in the event of drought
- Protecting and sustainably managing rangelands.
- The National Green Dam Rehabilitation Program by the DGF (new approach based on taking into account local specificities and the needs of populations)

Key challenges include:

- Desertification due to climate change.
- Conflicts over use and fragmentation of pastoral lands.

- The absence of a specific pastoral policy for mobility and sustainability.
- Focus of pastoralism efforts on the steppe and neglect of high cereal plains, mountains and wetlands.
- Lack of texts to protect pastoral areas in the north against heavily subsidized crops,

A wrong approach to the “resorption of fallow lands” which neglects the pastoral role of these temporary pastures

International Cooperation Initiatives and Partnerships for Sustainable Rangeland Management:

- FAO, UNDP, GIZ: Support for reforestation projects and rangeland management.
- Training of agents and technology transfers for sustainability.
- Progressive integration of climate change into policies and the forest sector (adaptation and communities)

Conclusion and Perspectives

Efforts for sustainable pastoralism in Algeria require:

- Integrated, multi-sectoral and locally concerted management of pastoral rangelands and areas to strengthen the resilience of pastoral and agro-pastoral systems.
- Strengthening climate change adaptation programs.
- Increased institutional support for the development of pastoral areas.

An essential reference : « L'Algérie pastorale, ses origines, sa formation, son passé, son présent, son avenir » (J.P Sagne, 1950)

Appendix No. 2 - Pastoral policy in Algeria: Legislation and efficiency; Resurrecting the pastoral code and the profession of pastor

Rachida AMRI, DSA Sétif

In Algeria, pastoralism is an essential livestock activity, based on the use of natural rangelands for feeding animals. This practice, particularly adapted to the arid and semi-arid ecosystems of the country, is deeply rooted in the regions of the High Plateaus and the Sahara, particularly in the steppe. Wikipedia emphasizes that pastoralism involves the mobility of herds to exploit natural grazing areas, thus constituting a way of life and a traditional economic practice.

The Legislative Framework of Pastoralism:

The Pastoral Code (Law No. 43-1975)

Enacted as part of Algeria's land reform, it aimed to establish a sustainable framework for pastoral land management, particularly in the harsh steppic environments. This law took important steps to support rural pastoral populations and mitigate environmental degradation in these arid regions.

The key provisions and objectives of the Pastoral Code:

Land ownership and livestock management: The law declared pastoral lands to be state property, but pastoralists retain ownership of their livestock, allowing a balance between state management and pastoralist autonomy, with regulated grazing rights for local communities.

Sustainable Limits on Livestock: The law imposed restrictions on herd stocking rates to protect the fragile steppe ecosystem. By limiting livestock, it aims to prevent overgrazing, preserve vegetation and reduce soil erosion, in order to combat desertification.

Abolition of the Azala System: The code abolished the Azala labor system, where herders accrued debts to livestock owners. This eased the burden on herders and encouraged more equitable economic practices in pastoral communities.

Support for vulnerable populations: Special measures have been implemented to protect the rights of vulnerable pastoralists, such as elderly pastoralists, widows and war veterans, in order to protect them from marginalization during economic transitions.

Training in cooperatives: To strengthen community resilience and improve resource management. However, these pastoralist cooperatives have encountered obstacles, including resistance from large landowners and the absence of some pastoralists, which has limited their initial success.

Environmental protection initiatives: Strict regulations have restricted some agricultural activities to protect soils, in parallel with the “Green Barrier” reforestation initiative against desertification. However, the success of this initiative has been limited due to ecological and technical constraints.

Overall, the Pastoral Code has a multidimensional approach to steppe management, combining economic support for herders with essential environmental management. However, the long-term effectiveness of the policy has encountered obstacles, particularly with regard to the success of cooperatives and sustainable environmental improvements.

The Agricultural Orientation Law (n° 08-16 of August 3, 2008)

It defines rangelands as state property, regulates the exploitation of pastoral resources and supports rural populations living from livestock. Adopted in 2008 in Algeria, it aims to structure and boost the agricultural sector, with a particular focus on sustainability, modernization, and natural resource management. It defines the strategic orientations and priorities for the development of agriculture, taking into account local specificities and the needs of different sub-sectors, including pastoralism.

Main measures and guidelines of this law regarding pastoralism:

- Preservation of Natural Resources
- Supervision and Modernization of Pastoralism
- Land Organization and Security
- Support for Training and Research
- Integration of Pastoral Practices in Local Development

Impact and challenges

Although the law provides support for pastoralism, challenges persist, such as inadequate water management infrastructure, climate change and scarcity of pastures. Implementation of the law often faces financial and logistical constraints, limiting often the effectiveness of initiatives.

Pastoral development is also hampered by the need to reconcile traditional practices with new sustainable development orientations, while taking into account modern productivity requirements.

In summary,

The Agricultural Orientation Law in Algeria attempts to meet the specific needs of pastoralism by proposing measures to protect the environment and supervise pastoral practices. However, its implementation depends on the capacity of local institutions to support breeders and invest in suitable infrastructure.

- *The National Agricultural Development Fund (FNDA): Law 14-07 of August 9th, 2014*

It provides a general framework for agricultural and pastoral activities, aimed at protecting land, preventing soil degradation and regulating access to natural resources.

To modernize the agricultural sector, as part of Algeria's economic reforms, the law aims to strengthen food security, improve the living conditions of farmers, and promote sustainable and integrated development of the agricultural sector.

The key points are:

Promotion of food security: It encourages in particular the production of basic crops such as wheat, milk and vegetables.

Protection of agricultural land: in particular the prohibition of the use of agricultural land for non-agricultural projects.

Modernization and productivity

Rural development and inclusion

Encouragement of private and public investments

Sustainable management of natural resources: The law promotes sustainable management of water, soil and biodiversity in the agricultural sector, taking into account the climatic and geographical specificities of Algeria.

This 2014 law represents an ambitious legal framework to transform Algerian agriculture and make it a more productive, sustainable sector, to meet the food needs of the population.

The National Rural Development Fund 2018

To strengthen food security, improve the living conditions of farmers, and promote sustainable and integrated development of the agricultural sector

Application of the Agricultural Policy: Specific Ministerial decrees.

They complete the legislative framework by regulating grazing periods and areas, herd mobility and rights to use pastoral lands.

In the form of various specific ministerial orders and decrees; the State applies all support programs as a social transfer mechanism for the **protection of the vulnerable population** of which small agro-pastoralists are a part (unemployment benefit, rural housing, subsidy of food intended for human consumption, etc.), mainly to ensure the **survival of the agro-pastoral profession**.

By direct support: Subsidies for the acquisition of livestock feed; in particular barley and wheat by-products, the production and processing of raw milk, and zoo-sanitary and vaccination measures, etc.

By indirect support: Subsidies for various agricultural activities such as cereal growing, rustic arboriculture (FNDR), agricultural inputs, irrigation equipment (decision No. 886) and energy resources.

Tax exemptions: VAT exemption on the sale of barley, corn and products for feeding livestock and poultry and under certain conditions.

The Dairy Subsidy Scheme

Why supporting mainly milk? Because raw milk is the main animal product in Algeria.

The State subsidy for the milk sector in Algeria aims to support national milk production and guarantee the supply of milk at affordable prices for consumers. These subsidies can take several forms, including direct financial aid to farmers producing raw milk (dairy cows, goats, sheep and camels), subsidies on inputs such as animal feed, and investments in milk collection and processing infrastructure.

The main objective of these subsidies is to strengthen milk self-sufficiency, reduce dependence on imports, and improve the quality of locally produced milk. However, the sector faces challenges such as fluctuating commodity prices, management and distribution issues, as well as the need to improve agricultural practices and livestock productivity. In summary, state subsidies play a crucial role in supporting the dairy sector in Algeria, but their effectiveness depends on the implementation of appropriate policies and the resolution of the sector's structural challenges.

Protection of the Pastoral Ecosystem (MADR, HCDS, DGF)

Reforestation: Reforestation and restoration programs for degraded rangelands to combat desertification.

Awareness-raising: Actions to raise awareness among livestock farmers about sustainable management practices

Pastoral resources.

Protected areas: Establishment of pastoral rest areas with temporarily limited access for herds

Protection of basins: Measures for the protection of watersheds and the maintenance of steppe and pastoral areas.

Support institutions and organizations

The Ministry of Agriculture and Rural Development: Main authority in charge of implementing pastoral policies and managing natural resources.

Specialized services:

Forestry services and rangeland and livestock services ensuring the control and protection of pastoral areas (e.g. High Commission for Steppe Development – HCDS, Agro-pastoralism Research Center, National Bureau of Studies specializing in Agricultural and Rural Development).

Professional organizations: Associations, cooperatives, chambers of agriculture and collective interest groups supporting breeders and farmers.

The characteristics and challenges of Algerian Pastoralism under the prism of the case of Sétif

Why Sétif ?

The wilaya (province) of Sétif is a concrete example of the situation of Algerian pastoralism; It is a part of an agricultural region called the high Sétif plains on an altitude of 1000 m on average; but it also includes a more or less rugged Northern zone as a Southern zone with semi-arid fragile plains, and characterized by a superficial soil and a dominance of rainfed

crops. Also, the main crops in Sétif are cereals linked to sheep farming, conducted by two populations under different systems:

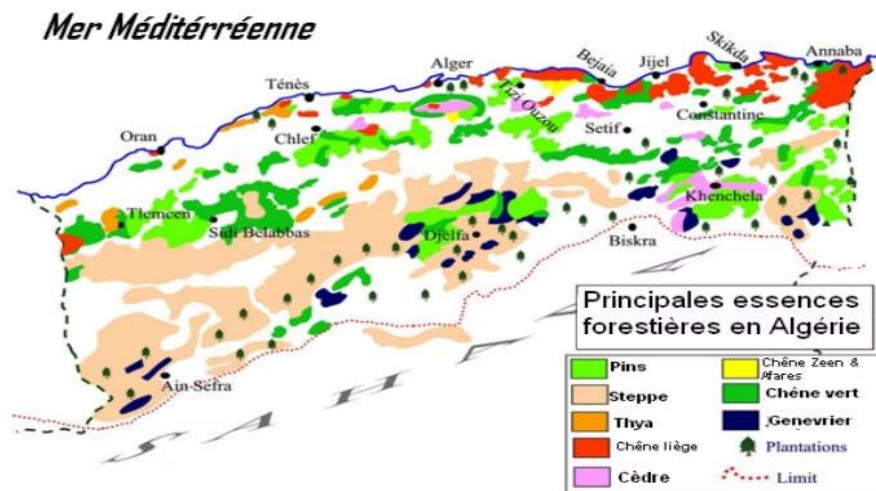
- Local inhabitants who practice agro-pastoralism using fallow land, meadows and rangelands on rough terrain not accessible to agriculture;
- Transhumant shepherds from the steppe who bring their herds to graze on wheat stubble during the summer; in return the herders of the High Plains graze in the steppe rich in pastoral vegetation during winter. These relations between the south and the north have declined sharply due to several socio-economic factors and pressure on pastoral lands has increased. This pressure is not alleviated by a clear agricultural policy, but state aid has been increased for cereals, despite the presence of a political provision for livestock farming, linked to fodder (barley, baled fodder, silage) but it remains insufficient. For all these reasons, the number of sheep livestock is in decline, and in addition, it has been replaced by state aid for the milk sector, by dairy cattle (ANSEJ) (A system where the state provided the means to buy dairy cows, but without follow-up.

Characterized by extensive livestock farming, this region faces major challenges such as overgrazing, competition for pastures and the effects of climate change.

Distribution of pastoral areas in Algeria

Distribution map of the steppe and high plateaus between the Telian Atlas and the Saharan Atlas in Algeria (HCDS 2017)





Distribution map of forest and steppe vegetation (DGF 2015)

The wilaya of Sétif currently benefits from significant support for the pastoralism and agriculture sector, as part of a national program to strengthen agricultural productivity and resilience. This support is manifested through various mechanisms, including the mechanism (N°866), which finances hydraulic equipment for farms, including irrigation systems, in order to support production in arid and semi-arid areas. In addition to subsidies for irrigation and equipment, a large water transfer project is underway, aimed at channeling water from nearby dams to the Sétif region. This project is expected to allow the irrigation of 30,000 hectares of agricultural land, thus significantly improving local production. Investments are also being made in the creation of silos and storage centers to increase the storage capacity of crops, a crucial measure to ensure food security and stabilize prices (AgriAlgerie.com and Sétif Info2024)

These initiatives are part of a global effort to improve agricultural yields and support the development of pastoral sectors in the region, including:

- Strengthening grazing on stubble;
- Strengthening green fodder crops (green barley, fodder legumes);
- Ensuring the supply of livestock feed (barley, cereal by-products).

Conclusions et perspectives

Pastoralism plays a crucial role in Algerian agriculture, which faces significant challenges such as overgrazing, soil degradation and climate change.

The priority on cereal farming and the development of pastoral rangelands for arboriculture disadvantage pastoralism.

Government support measures aim to improve the living conditions of herders, promote sustainable economic activities and integrate rural areas into national development.

*The success of these initiatives will depend on collaboration between authorities, professional organisations and pastoral communities through the **establishment of a pastoral code that meets current challenges** to ensure a sustainable future for this ancestral practice.*

Appendix No. 3 – Grazing under forests, Regulations and strategies

INTRODUCTION :

Considering the importance of forest heritage, the Algerian Constitution stipulates in its articles 18 and 19 that:

- "the forest is a common good of the national community and therefore falls under public property"
- "The State guarantees the rational use of natural resources as well as their preservation for the benefit of future generations".

Law No. 23-21 of December 23rd, 2023 on the management of forests and forest resources

The sustainable management of forests, woods and forest-related land is "a fundamental priority" of the national economic and social development policy and is integrated into the regional planning process.

In this context, the new law introduces the obligation to implement an inventory of national forest resources, established "every ten years" and updated periodically. This inventory should make it possible to develop the national plan and guide the national forest strategy.

This law considers to be of national interest:

- the protection, development and rational use of forests, other forest formations and lands dedicated to forestry;
- the preservation and fight against fires and all other alterations and degradations of the forest environment;
- the protection and rational use of lands subject to erosion and desertification

This law is a regulatory framework for pastoralism in forests and forest-related lands.

14 articles of the new law are in favor of pastoralism and included in the main orientations:

- Sustainable management of forests and forestry lands
- Forest grazing
- Protection of national forest heritage
- Valorization of forests and forest resources
- Sustainable management of forests and forestry lands

Articles on the protection of national forest heritage

- Art.75 (Art.26 Law 84-152 of june 16th 1984)

Le pâturage dans le domaine public forestier est réglementé conformément aux plans d'aménagement forestiers.

Grazing in the public forest domain is regulated in accordance with forest management plans.

However, grazing is prohibited in:

- Natural habitats containing protected species;

- Burnt areas;
 - Young plantations with trees less than five metres high;
 - Plots of land undergoing natural regeneration;
 - Plots of land subject to public sylvo-pastoral development programmes that are not yet defensible;
 - Dune cordons, whether or not developed, covered with plants and shrubs;
 - Plots of pastoral land improved by planting shrubs and fodder plants, not yet deferred

- Art.76

The forestry administration ensures the protection and development of rangelands belonging to the public forest domain and the pastoral resources they contain or those placed under its authority, and pays particular attention to the restoration of agro-sylvo-pastoral balances.

- Art.77

Forests, woods and land intended for forestry and rangeland whose state of degradation requires a prolonged period of rest, essential for their reconstitution, may be placed under protection and reserved from grazing.

- Art.78

The forestry administration shall draw up, after investigation and establishment of a detailed inventory, the list of areas mentioned in Article 77 above and set the duration necessary for their protection.

Protection is decided, on the proposal of the forestry administration, by decree of the territorially competent wali. It may be extended in the event that the objectives are not achieved.

The protection order determines the nature, location and limits of the lands protected as well as the duration issued.

Protection ends similarly as its declaration.

- Art.79

During the period of protection, the administration responsible for forests may carry out on the protected land, the work deemed necessary for the consolidation and regeneration of soils and plants, without this work changing their nature and purpose.

- Art.104 Valorization of forests and forest resources

The valorization of the public forest domain can be done through:

- The exploitation of wood and non-wood forest products;
- Uses in the public forest domain;
- Grazing;
- Hunting, in accordance with the legislation in force

- Art.105

Any exploitation of products, grazing and use of the public forest domain are subject to the payment of royalties, the amounts of which are fixed by the provisions of the finance law.

- Art.106

The administrative and technical rules for exploitation, transfer of wood and non-wood forest products, granting of authorization for use and management of grazing activities in the public forest domain are set by regulation.

- Art.107

The exploitation of timber and non-timber forest products falling within the public forest domain is carried out in accordance with the requirements of the development or management plans provided for in Article 36.

- Art.109 (Art. 35 Law 84-152 of June 16th 1984)

Authorizations for use may be granted to individuals or legal entities in the public forest domain, on portions of land provided for by the forest management plan, for:

- The development of bare land by rustic, paraforest and forestry tree plantations;
- The cultivation of aromatic and medicinal plants;
- The development and use of forests or portions of forests for recreational, ecotourism and leisure purposes;
- The establishment of nurseries specializing in the production of forest and paraforest plants or aromatic and medicinal plants;
- Game breeding and beekeeping;
- The development of forestry equipment and infrastructure

- Art.110

Grazing on public forest land is authorized, in accordance with the requirements of the forest, woodland or forestry land development or management plan, by the forestry administration. When the plant cover or soil of a rangeland is in a state of degradation, the forestry administration may postpone or prohibit grazing.

The protection of rangeland in the public forest land is exercised in accordance with the rules defined by the provisions of Articles 77, 78 and 79 of this law.

- Art.111

Grazing and harvesting carried out on rangeland falling within the public forest domain may only be carried out by the holder of an authorization issued by the administration responsible for forests.

- Art.119 (Art.34 Law 84-152 June, 16th 1984)

Residents living near forests have the right to use, for their domestic needs, products from forests, woods and forestry lands in the public forest domain, which are accessible on foot from their homes.

The usage rights are strictly limited to the personal needs of the resident and members of his family living with him, without being able to have a commercial or industrial character.

Penal provisions

- Art.144 (Art 81, 82 Law 84-152 June 16th 1984)

Anyone who commits the offence of illegal grazing in the prohibited areas referred to in Articles 75 and 77 shall be punished with a fine of:

5,000 DA to 10,000 for wool animals or calves

15,000 to 20,000 DA for cattle, beasts of burden or camels

25,000 to 30,000 DA for goats

Without prejudice to the fines applied, compensation for the damage caused is added.

Pastoral land rehabilitation measures

- The National Reforestation Plan (PNR)

Adopted in 1999, it aimed to increase the afforestation rate from 11 to 14% by planting more than 1.2 Mha (60,000 ha/year) for northern Algeria.

It also aimed to consolidate the green dam, protect 30 watersheds, improve soils, strengthen the forest fire prevention and control system, and promote fruit plantations as part of the concession policy.

Over the period 2000-2022, the PNR contributed to the reforestation of 520,000 ha of forest land, the rehabilitation of 34,000 ha of pastoral land and 301,000 ha of agricultural land for fruit production (DRTR, 2022).

For the period 2023-2030, an action program for the rehabilitation, extension and development of the green dam

- The National Green Dam Rehabilitation Program

In 1972, the Algerian state announced the construction of the Green Dam, whose initial design was essentially forestry, aiming to afforest 3 million hectares to stop the advance of the desert.

Currently, this project contributes to mitigating the effects of climate change, and to ecological and social balance through an integrated approach with the aim of promoting the economic and social development of the local population living in the areas located in this green strip.

The actions included in the Green Dam program in the forestry sector consist of fodder planting and protection.

The objective was none other than the development of rangelands that had suffered atrocious degradation caused by overgrazing. This development focused on increasing fodder capacity through plantations and limiting grazing pressure in the forest, especially in young reforestation. This type of plantation was mainly based on a few species such as atriplex, opuntia and acacia.

CONCLUSION

Fodder resources in the forest are important but not evaluated.

However, pressure is exerted on this resource, the protection and development of which are unavailable.

Populations are regaining their role as conservators of natural resources. It is a question of ensuring that this role is well understood and that it is effectively fulfilled for a more judicious use of resources.

Appendix No. 4 - The Shepherd's Guide, Guardian of the Environment

Shepherd is above all a profession

The "shepherd" takes care of the herd. He is responsible for the management and care of the herds and his role goes well beyond the simple management of the animals.

The technical skills of the shepherds represent the main guarantee of the success of the exercise of breeding or the limitation of damage in an irregular environment.

Generally, mastering this know-how requires learning, from a young age, the profession of guarding.

The shepherd of transhumant herds is often called upon to make decisions of a zootechnical, veterinary, pastoral and even ecological nature.

The technicality of the shepherd not only affects the performance of the herds but also buffers or accentuates the threats of desertification of rangelands with fragile ecological systems.

The role of the shepherd

- **Herd management:** The shepherd plans routes, observes, analyzes situations and adapts his progress in order to best satisfy the herd by making the best use, from his point of view, of pastoral resources. Therefore, he provides the animals with good quality fodder, while maintaining the quality of the pasture.
- **Pasture management:** the shepherd can lead the herds to the best grazing areas, avoid flooded areas, he can optimize the nutritional value of the pastures by making them consume double what is scientifically planned based on the nutritional qualities of the plants.
- **Animal protection:** Guarding is essential for several reasons, in particular to avoid conflicts with other breeders due to the absence of fences for fallow land, meadows and cultivated fields, as well as to protect the animals from predators (wild boar, fox) and theft.
- **Herding:** Herding and the know-how associated with it can be one of the conditions for the sustainability of pastoral and agropastoral livestock systems and the natural fodder resources on which they depend.
- **Fire prevention:** By grazing grassy areas, sheep reduce the risk of accumulation of combustible materials, which contributes to the prevention of forest fires.
- **Natural fertilization:** Sheep droppings enrich the soil with nutrients, thus promoting plant growth and the health of ecosystems.
- **Biodiversity:** Regardless of the method of herding, herding is a way of maintaining pastoral areas and safeguarding a diversity of flora and fauna.

Training? Where and how?

In the absence of a training school for shepherds at the regional and national levels, we recommend, within the framework of PATINNOVA, that stakeholders in livestock farming in the wilaya, as well as at the national level (chamber of agriculture, ITMAS, chambers of crafts and trades), take into consideration the need to create training programs such as PRCHAT to ensure sustainable livestock practices and improve productivity. This training

also makes it possible to transmit key skills in herd management and environmental protection, thus contributing to rural development.

How to successfully train shepherds?

Assessing the needs of shepherds

- Identify the existing knowledge and skills of shepherds (traditional know-how, pastoral practices).
- Analyze the specific challenges faced by shepherds in each region (e.g. pasture management, animal diseases, accessibility to water, climate change).
- Involve shepherds in defining training objectives, so that they feel concerned and motivated by the training offered.

Schedule training adapted to shepherds

- On animal health and care: Prevention and management of animal diseases (vaccination, deworming) and first veterinary emergencies.
- On pasture and feed management: Pasture rotation techniques, prevention of overgrazing, selection of fodder plants adapted to local conditions, and water management.
- On sustainable agro-pastoralism techniques: Integration of crops and livestock to improve profitability while preserving the environment.
- On animal reproduction and genetics: Artificial insemination, selection of the best animal breeds).
- On economic and commercial management: Financial management, valorization of derived products (meat, milk, cheese, wool), marketing and access to local and regional markets.

Propose teaching methods

- Practical demonstrations in the field: on pasture management, animal care.
- Use of experienced shepherds as trainers: in order to strengthen the practical aspect and to rely on local knowledge while integrating new methods.
- Organization of practical workshops and demonstrations: Construction of shelters for animals, basic veterinary care, etc.).
- Use of visual aids: Due to the low school enrollment rate of some shepherds, use videos, illustrations and visual demonstrations.
- Creation of exchange networks: between shepherds and experts (veterinarians, agronomists, etc.) to facilitate the emergence of concrete solutions to local problems.

Provide long-term continuing education

- Organize regular field visits to assess the application of acquired skills, answer questions and make adjustments.
- Encourage groups of shepherds to form cooperatives or associations. This allows them to help each other, share resources, and have a stronger economic and social weight.
- Establish a support platform, information, veterinary, or agricultural advisors for constant support.



Develop partnerships with local stakeholders

- Local authorities: The Ministries of Agriculture, Environment, Health, and local authorities can support training initiatives, particularly in setting up infrastructure, financing programs or tax incentives.
- Universities and research centers: Collaboration with specialized institutes to introduce modern agricultural and veterinary techniques adapted to the Algerian context.
- Private companies (especially those specializing in agricultural or veterinary products): They can provide resources, equipment, and even finance training programs.

Use technology

- Mobile applications and online platforms: Use mobile applications to provide distance training, share information on animal health, markets or pasture management.
- Video supports: Create educational videos on good practices to share via mobile platforms
- Mapping technologies: To train shepherds in pasture management and assessment of available natural resources.

Conclusion

The shepherd is a key stake holder to preserve our environment. His know-how and commitment to sustainable practices contribute to a greener and more balanced future. His training must be designed as a global process, taking into account both technical needs, local realities and the involvement of field stakeholders. By combining practical training, ongoing support and encouragement of innovation, shepherds will be able to improve their practices, increase productivity and develop sustainable breeding methods, while preserving their traditional know-how.