ResAlliance

Type of solution: Governance Sector: Agroforestry
Good practice(s): Management alternatives, Ecosystems services, Community engagement

The Agdal pastoral system in Morocco: community-based natural resource management for socio-ecological resilience

Agdal system exemplifies a holistic approach to natural resources conservation, sustainable development, participatory governance, conflict resolution and social justice.

Sheep grazing in the High Atlas.
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Beginning of the transhumance journey near the Jebel Saghrou mountains, along the road leading to the agdal.
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/// Context ///

Socio-ecological landscapes in the Mediterranean area have evolved over long periods through the balanced interaction between humans and nature. These landscapes have been shaped and maintained by generations of farmers and herders using diverse natural resources and locally adapted management practices. These systems have resulted in the preservation of outstanding landscapes, indigenous knowledge systems, and resilient ecosystems.

A prime example of these socio-ecological landscapes is the pastoral Agdals in Morocco. Found in North Africa, especially in the High Atlas Mountains in Morocco, Agdals are community-based natural resource management systems where people have developed effective cultural and governance practices. The functioning of Agdals is based on the seasonal closure of pasturelands to protect and conserve natural resources, particularly grasslands. This practice ensures sustainable resource use by controlling grazing periods and allowing the land to regenerate. Agdals are managed by local communities through customary rules and agreements.

The benefits provided by the agdal system include:

- Empowerment of community members through participatory decision-making processes.

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- Conflict resolution and cooperation among community members.
- Preservation of vegetation cover and biodiversity, ensuring ecological health and resilience.
- Creation of ecological mosaics through diverse land uses.
- Provision of fodder, especially critical during periods of scarcity.
- Social cohesion, strengthening communal bonds and a sense of belonging.
- More equitable distribution of benefits, ensuring most community members have access to resources.
- Increased economic activities through sustainable practices.

Most importantly, agdals enhance the socio-ecological landscape's resilience and adaptive capacity in the face of the natural hazards, such as recurrent droughts, extreme cold, and floods, that have historically affected this region and that are intensifying due to climate change. This is achieved through flexible management strategies, informed by the use of traditional ecological knowledge, that respond to environmental constraints and social dynamics.

/// Solution for a Resilient Future ///

Moroccan agdals represent a sophisticated and time-tested form of community-based management of natural resources, significantly contributing to both social and ecological resilience.

1. Participatory Decision-Making and Conflict Resolution

Agdals are managed through a participatory decision-making process that involves the entire community; however, men typically assume a central role due to cultural traditions. The tribal assembly, or jmaa, composed of heads of households, is the political body that establishes the rules and supervises the implementation of agdal practices. By engaging all stakeholders, agdals empower citizens and foster a sense of ownership and responsibility towards local resources. This participatory approach not only improves resource productivity but also ensures its sustainable use and fair distribution among users, thus enhancing community resilience.

This system plays also a crucial role in resolving conflicts and promoting cooperation within and between communities. Customary assemblies are the place for negotiating and exercising rights collectively, while a system of monitoring and sanctions ensures compliance with agreed rules. Exclusive village control over agdals helps manage inter-community conflicts by establishing clear territorial and social boundaries (Auclair et al., 2011).

2. Conservation of Natural Resources and Diversification of Land Uses

Agdals enhance ecological resilience through the conservation of natural resources and the diversification of land uses. One of the key aspects of agdal management is the strategic prohibition of herding during critical periods of the vegetation cycle. For example, the Yagour agdal is closed from the end of March for three months, encompassing the crucial month of May when pastoral plants undergo significant growth. This seasonal prohibition allows plants to flower, reproduce, and germinate without the pressure of grazing. Consequently, the vegetation within agdals can regenerate more robustly compared to non-protected areas, leading to higher plant diversity and denser vegetation cover.

In addition, the system creates an ecological mosaic across the landscape by implementing different agdals with staggered opening and closing times. This mosaic approach encourages the growth and regeneration of various species at different times and places, promoting a diverse range of habitats and microclimates. This ecological mosaic effect is critical to maintaining the genetic diversity of plant populations (Dominguez, 2012).

Finally, they have usually provided vital support for livestock by ensuring a reliable supply of fodder during critical times such as summer droughts. Furthermore, the manure from agdal-fed animals enriches agricultural lands, improving soil fertility and crop productivity.

3. Resources and Equity

The collective nature of agdals ensures that all community members have equal access to pastures and other resources, promoting social justice among herders. Agdal prohibitions are negotiated and agreed upon by the community, and rules for resource exploitation, such as quotas for harvesting leaf fodder, are established on the basis of egalitarian values. In this way, the system embodies and reflects the intricate values of social justice and equity, which contribute to the social sustainability and resilience of rural communities (Dominguez, 2012).

4. Adaptive Capacity

Herders' extensive knowledge of grazing plant growth cycles and local climate patterns inform agdal resource

Mobile pastoralism in the High Atlas.
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> **The flexible and adaptive nature of agdal governance enables communities to respond effectively to social and ecological disturbances, maintaining ecosystem integrity and resource availability.**

Traditional fodder gathering.
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management, allowing communities to adjust grazing intensity and time restrictions based on ecological feedback. The flexible and adaptive nature of agdal governance allows communities to respond effectively to social and ecological disturbances, while maintaining ecosystem integrity and resource availability (Plieninger et al., 2022).

5. Contribution to the Local Economy

Agdals significantly contribute to the local economy by providing essential fodder during critical periods, enriching agricultural lands with manure, and generating income through ecotourism. The system brings in a substantial portion of annual fodder, particularly when other pastures are unproductive, thereby stabilizing the local economy and supporting community livelihoods.

In conclusion, Moroccan agdals exemplify a robust and adaptive system of collective land management that enhances both social and ecological landscape resilience. Through participatory governance, conflict resolution, resource conservation, and equitable resource distribution, agdals empower communities, foster social cohesion, and ensure the sustainable use of natural resources, making them a vital tool for addressing the challenges posed by climate change and socio-economic crises.

/// Always Moving Forward ///

Agdals play a crucial role in preserving biodiversity, maintaining resilient ecosystems, and supporting the livelihoods of local communities. However, these systems are currently facing numerous threats that jeopardize their sustainability.

A major threat to the agdals is the exodus of young people to urban areas due to the lack of socioeconomic opportunities and harsh living conditions in the High Atlas. This migration leads to the loss of traditional knowledge and practices essential to the management of these systems. The abandonment of transhumance, a traditional practice where pastoralists move their herds seasonally, leads to the neglect of temporal grazing restrictions essential for agdal sustainability. This results in overgrazing, plant degradation, and biodiversity loss. Climate change further exacerbates the situation, with harsher summer droughts increasing conflicts over agdal governance and access to water. The unpredictability of rainfall and extreme temperatures strain the delicate balance needed to maintain these systems. Finally, despite their contributions to biodiversity conservation and sustainable land use, agdals suffer from insufficient recognition and support from governmental and international bodies. Policies often favor privatization and agribusiness, marginalizing local resource users and undermining traditions of collective land management. Global market forces that favor intensive agriculture over sustainable practices also put immense pressure on the agdals.

Therefore, to protect and support agdals, several measures should be undertaken. Firstly, it is key to strengthen the legal recognition and protection of agdals within national legislation, ensuring that policies acknowledge and safeguard customary land rights and governance practices. Raising awareness about the importance of agdals through educational campaigns and public outreach initiatives can help highlight their role in biodiversity conservation, cultural preservation, and sustainable development, fostering greater public support. Increased collaboration among communities, government agencies, nongovernmental organizations, and international bodies is critical to securing financial resources and technical support; funding mechanisms should be designed to meet the needs and priorities of local communities, ensuring the sustainability of agdal systems. Socioeconomic development in the High Atlas region is pivotal to reduce youth migration and retain traditional knowledge; programs that create jobs, improve living conditions, and provide essential services can make rural life more sustainable and attractive. In addition, it is essential to integrate agdals into national

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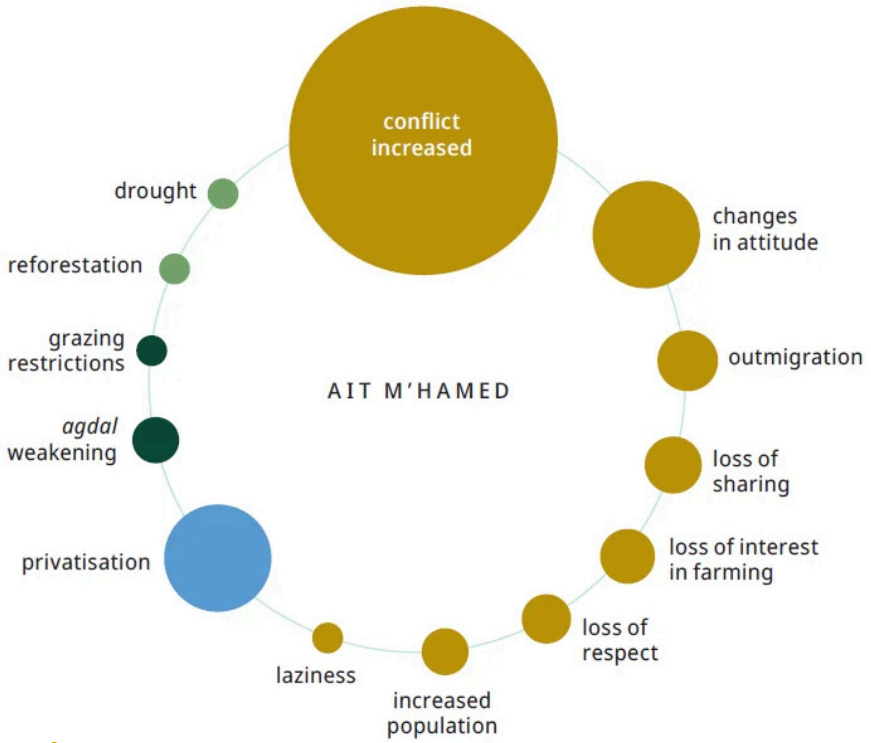
Challenges identified by inhabitants from the commune of Ait M'hamed.
Author: Global Diversity Foundation & Moroccan Biodiversity and Livelihoods Association



Protecting and further developing these systems is essential to maintaining the environmental sustainability, cultural heritage, and local livelihoods of the High Atlas region.

strategies, such as the Moroccan government's Green Generation Strategy 2020-2030, which aims to modernize agriculture. Measures to support agdals include building water infrastructure, providing mobile schools and health services, and restoring vegetation in pastoral areas.

In conclusion, community management of agdals is a socio-culturally resilient, economically sustainable and ecologically enriching land use approach. Protecting and further developing these systems is essential to maintaining the environmental sustainability, cultural heritage, and local livelihoods of the High Atlas region. It is critical to design effective strategies so that the Agdal will continue to thrive and adapt, offering valuable lessons on sustainable resource management and community resilience.

Further information

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