Building the ecologic and socio-economic resilience of the Shouf Mountain Landscape by restoring and strengthening the socio-cultural fabric which sustains its biodiversity and cultural values

Mountain Pastures' Restoration in Lebanon: A review

S. K. Hamadeh

Environment and Sustainable Development Unit (ESDU)

American University of Beirut

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I. Introduction

The MAVA funded Project "Building the ecologic and socio-economic resilience of the Shouf Mountain Landscape by restoring and strengthening the socio-cultural fabric which sustains its biodiversity and cultural values" is implemented by ACS – Al Shouf Cedar Society in partnership with SPNL - Society for the Protection of Nature of Lebanon and aims to: (i) increase the understanding and recognition of the links between the traditional practices that constitute the cultural heritage of the landscape and its biodiversity; (ii) stop and reverse the major threats impacting the landscape, and adapt the cultural practices to current socio-economic context and environmental constraints – with special focus to climate change trends –through innovations in sustainable management and the restoration of optimal conditions; (iii) ensure the economic sustainability of the goods and services resulting from the cultural practices, by supporting the greening of the economy; and (iv) create enabling conditions through the improvement of policy, governance, and the capacity of all concerned stakeholders, so as to secure the upscaling and replication of best practices in Mount Lebanon and in the other cultural landscapes; and includes a pilot action focusing on The Shouf Mountain Landscape comprising the southern half of Mount Lebanon and the adjacent West Beqaa foothills.

"Strategy 2", under the project, addresses the design and implementation of restoration plans for mountain pastures and wildlife. Activities under this component are not the first ones tackling issues related to pastures and rangelands management in Lebanon and more specifically in the West Bekaa.

The objective of this report is to provide a review of previous programmes, initiatives and studies related to rangelands and pastures management and restoration in Lebanon from 2008 till today. It also summarizes the gaps for pastures management and highlights measures that were suggested for a strengthened rangelands management. This report is based on a desk review of available literature, projects and initiatives on projects targeting rangelands in Lebanon in addition to consultation meetings with experts in the field (from the UNDP and MoA).

I. Projects targeting Lebanese Rangelands

Data on rangeland management in Lebanon is limited to scientific research conducted by academics, as well as reports developed in the framework of development projects.

According to Darwich and Faour (2008) who assessed the impact of environmental and social factors on Lebanese mountains' rangelands degradation, 38% of the total Lebanese area can be considered as rangelands. Their use of remote sensing in the studied areas of Arsal and Kfarselwane, revealed 388,200 ha of marginal lands suitable for grazing out of which only 10 to 20% can be considered as rangelands. These lands are mainly situated on mountain slopes where grazing period varies from 3 to 6 months depending on altitude, climate and lands carrying capacity. Even though animal grazing is not allowed in Kfarselouane's protected forest but relies on dry herbs and plant residues in this region, small ruminants' rangelands grazing is carried out essentially during summer and fall periods and is the main cause of declination in the green vegetation cover in both studied areas. In fact, overgrazing and other landuse constraints in Arsal are the causes of the said rangeland degradation.

In their report entitled "Grazing in Lebanon, Syria and Jordan" submitted in 2014 within the Med consortium on "Assessing and supporting cultural conservation practices in the Mediterranean Phase 2", SPNL mentions that only 16,000 ha from the Lebanese territory are permanent pastures which represents almost 15% of the country's land cover. These pastures are not regulated by any governmental policy because the grazing policies in Lebanon are few articles within the forest law, adding to it the lack of data, research and studies which prevents the Ministry from developing sustainable management policies. Moreover, social, economic and political conflicts are also factors hindering the establishment of a sustainable rangelands management policy. "Policy makers are not aware of the importance of pastoralists in being able to manage rangelands properly and be best used for the development of efficient governmental programs for rangeland management".

In 2014, Sattout stated in the 8th chapter of "The Governance of Rangelands, Collective Action for Sustainable Pastoralism" book, that the Bekaa valley as well as its adjacent steppic areas host most of small ruminants found in Lebanon. She described local herds semi nomadic

movement as being seasonal directed mainly to Syria in winter and to Lebanese rangelands in addition to local migration from low to high altitudes mainly in the western mountain chain in summer although these transhumance activities decreased drastically several years ago with the reliance on feed supplementation shifting to a sedentary ruminant's production. She insists on the fact that rangelands management improvement relies on building capacity of local governance and pastoralists communities and the increase of local awareness about this subject will improve the relationship between local/national governance and pastoralists despite political challenges. This could be achieved through the *Hima* system where herders are given the opportunity to voice for rangelands management operational processes. This *Hima* system was revived by SPNL first in Ebel El Saqi, South Lebanon, a system relying on a community based management system where local authorities collaborate with pastoralists to manage communal rangelands. *Himas* do not only sustainably preserve rangelands by insuring vegetation protection during regeneration season hence improving carrying capacity of pastures through flocks' size definition, but also empower women in rural areas.

In 2016, SPNL acknowledged through their website their active efforts to promote the principles of *Himas* throughout Lebanon where 17 *Himas* got established since 2004 with local municipalities. A special emphasis is given to the *Hima* of El Fekha since this *Hima* provides the basis for organizing the grazing system in El Fekha, whereby methods for sustainable grazing are promoted by SPNL in coordination with the local herders themselves.

In his assessment and evaluation of grazing activities at the Shouf Cedar Biosphere Reserve (Phase II) report (November 2018), Dr. Mounir Abi Said acknowledged rangelands sustainability to be dependent on the structure and dynamics of their plant and animal communities; this is the reason why overgrazing would lead to ecosystem degradation and diversity loss. To avoid this latter consequence, stocking rate should be estimated, and a clean water source should be provided (key factor to consider when managing livestock within rangelands). He then exposed 4 types of grazing systems (continuous grazing, deferred grazing, rotational grazing, deferred rotation grazing) used in rangelands grazing management to avoid overgrazing and

overexploitation of the resources, in addition to allowing plants to re-grow to assure their continuity. However and in order to insure the management plan success and sustainability, flora, domestic and wild fauna and human resources should be assessed as well as factors affecting them and grazing efficiency improvement methods provided.

In its five-year management plan (2013-2018), the Shouf Cedar Reserve in collaboration with the Ministry of Environment, highlighted the importance of the portfolio of projects and programs, in addition to five schemes: a rural products marketing strategy, an ecotourism strategy, an integrated monitoring plan that shows the state of the site and environmental trends, a risk assessment plan and a grazing plan. In the framework of this latter, pastoral areas were defined according to their altitude from 800m to 1300m. Due to the importance of grazing and its direct link to the reintroduction of the mountain Ibis that can reproduce with Lebanese local goats, the reserve has updated the information related to pastoralists and their movements in pastoral areas of the Shouf and West Bekaa as preliminary step for the subsequent developed agenda focusing on reviewing pastoral areas and aiming at increasing the technical and financial capacity of pastoralists and making them part of the ecosystem rehabilitation plan, specifically contributing to biomass management and pasture rehabilitation, which are very important areas of biodiversity.

The Shouf Biosphere Reserve, in their Forest and Landscape Restoration (FLR) guidelines published in 2019, defines the Forest and Landscape Restoration (FLR) as “a planned process to restore ecological integrity and enhance human well-being in degraded forest landscapes so that their ecological and social resilience is strengthened and their ecosystem services are enhanced to support the societal needs”. Falling under the seventh FLR principle: Maintains and Enhances Natural Ecosystems within the Landscape, SBR dedicated a whole chapter to the sustainable grazing as a further step after grasslands protection through temporary enclosures and thinning and pruning operations in forests. Indeed, the livestock grazing according to the principles of rotation and resting under a well-managed scheme will prevent grasses from ageing thus avoiding land degradation and loss of biodiversity. “Controlled grazing allows for more even distribution of dung and urine that can enhance soil organic matter and nutrients for

plant productivity thus regenerating grasslands and improving livestock production simultaneously". Also according to SBR, the temporary exclusion of animal grazing in degraded landscapes represents a very successful approach in FLR projects resulting in a very fast recovery of the former vegetation and the quality of soil. Under this principle, the *Hima* approach promoted by SPNL has been re-established in the West Bekaa for managing grazing on communal territories used by several shepherds. One more approach involving herds is the Livestock grazing as a fire prevention technique which helps reduce fire intensity as well as fire extinguishing services access facilitation by controlling the growth of the forest understory in high fire-risk areas.

In their baseline socio-economic assessment and monitoring & evaluation guidelines report for the districts of Zahle, Rachaya and West Bekaa for the sustainable land management in the Qaraoun catchment (SLMQ) project published in 2018, UNDP exposed the designation of special zones in Ammiq, West Bekaa project implemented by SPNL in collaboration with the Union of Municipalities of the Lake as one pilot project that yielded good results and better management of rangelands and forest areas.. UNDP hopes that by replicating this zoning experience in their project implementation sites, overgrazing will be significantly reduced and local authorities will have better control and management of the endangered rangelands and forests. This improved rangelands management is expected to give results in 2020.

On another hand, Chedid *et al*. (2018) who investigated the main constraints affecting small ruminant production in the West Bekaa of Lebanon as perceived by the farmers, and their reported adaptive strategies, identified four semi-sedentary systems. Among perceived constraints, 25% of shepherds reported pasture access and quality as the major challenge; indeed, shepherds acknowledged a serious change in pastures quality when it comes to green coverage density and diversification. Some desired plants such as the white and red clovers (*Trifolium sp*.) and wild lentils species (*Lens sp.)* are classified as declining. As measures to overcome challenges, shepherds have resolved to decrease their herds' size along with feed supplementation and to a lesser extent - because of local policies and presence of protected

areas -, changing herd movement. The most adopted coping strategy was the increased herd/pastures contact time; in fact herds spent 11–12 months on the pasture. All the identified production systems fully relied on natural pastures in the mountainous forests of pine, oak and beech, between October and March, and on crop residues in the plain starting late summer. However, access to pastures was hindered by municipal policies and the land tenure system which does not delineate the role of local authorities in managing common lands, and by the inheritance laws that prevents the efficient use of lands.

The UNDP which is currently implementing a project on "Sustainable Land Management in the Qaraoun Catchment", implemented a Technical Training on the Proposed National Rangeland Management Guidelines in September 2019 in which Dr. Kyriazopoulos acknowledged the fact that small ruminants grazing happens mainly in rangelands specially that rangelands contribute importantly to animal feeding; particularly in transhumance. Dr. Kyriazopoulos also tackled the development of rangeland management plans as being a multi-dimensional exercise combining local flora as well as local socio-economical and legal frameworks. In fact, these locally customized criteria should greatly influence the plans content, in a time where rangeland plans are limited to overgrazing and erosion control. Indeed and since rangelands management main goals are to "Maximize the production and utilization of rangelands" along with achieving "maximum animal production together with the conservation of vegetation, soil, water and the other natural resources" , principles guiding grazing in rangelands include limiting the livestock numbers, setting forage plants grazing period, and effectively distributing livestock use across rangelands. Thus a rangeland management plan is either maintaining or restoring rangelands. Restoration is necessary in reversing the negative effect of overgrazing, abandonment and fires on land degradation as well as increase forage productivity and quality.

II. Observations

Subsequent to their assessment, Darwich and Faour (2008) observed a decline in rangeland availability due to agricultural expansion, erosion and urbanization combined to the low rangelands productivity (Lebanese rangeland carrying capacity may reach a maximum of

800000 small ruminant heads); these were previously reported by Hamadeh et al in several studies which assessed grazing in the Bekaa valley. The authors also attested the mountain rangelands overgrazed status through grazing pattern and vegetation index comparison and acknowledged Arsal for suffering from higher rate of rangeland degradation due to additional factors (lack of capacity build farmers and conservation measures) despite the fact that land abandonment has an increased pressure on Kfarselouane lands.

Sattout and Caligari (2011) stated that the very first nature reserve managerial schemes focused only on conservation measures affecting subsequently not only the ecological evolutionary processes but also disrupting the existing relationship between humans and their environment. Sattout (2014) noted that the shift to a sedentary production system had an indirect impact on the local flora. Indeed an improved vegetation formation as well as green cover quality was witnessed in villages where grazing practices has decreased.

The role of rangelands in improving rural livelihoods is quite important and acknowledged by scientists all over the world. However, in Lebanon, similarly to other countries around the word, SPNL (2014) observed that pastoralism stands as a surviving lifestyle in time of multi-levels conflicts. Native traditional knowledge used in pasture management is best used as a tool for conserving the ecosystems; however, according to Chedid et al. (2018), pastoralists' experiences and lifestyles are not taken into consideration in decision making and are still considered a weak approach of a national strategy. Despite the fact that all these points are extremely crucial for the sustainable management of rangelands, nothing has been implemented till today. Sattout (2014) observed that Himas being based on a community participatory approach can be the platform towards a better rangelands management, specially the marginal communal lands, and subsequently safeguard the pastoral system. Concurrently, Abi Said (2018) observed that sustainable management is essential for rangelands conservation while providing the pastoral community a low ruminant's production cost through low cost feed and water. Sustainable rangelands management could be achieved by "coordinated and

managed grazing practices within protected areas, which benefits livestock production and, at the same time, protect natural resources and landscapes".

UNDP reported that rangeland management decisions focus mainly on ecological issues "such as soil health, vegetation, wildlife, and water quality" and lead to overgrazing and erosion control since "livestock grazing is the most widespread and important use of rangelands" thus the proper management of livestock grazing influence greatly the long-term sustainability of the soil-plant-animal resource base and the key to a sustainable rangeland management is moderate livestock forage utilization leading to species composition, biodiversity and productivity maintenance.

According to Chedid *et al*. (2018), even though the West Bekaa region hosts a large proportion of the small ruminant farmers in Lebanon, this region still faces multitude of challenges (environmental pressures and market constraints) in the absence of governmental support. In response, farmers developed uncoordinated adaptive strategies mainly shifting to sedentary production systems and increasing feed supplementation. Moreover, it was observed that the decline in pastoral fodder biodiversity may be the result of a combination of overgrazing and early droughts as explained by the shepherds.

III. Recommendations

Regarding the issue of overgrazing in summer, Darwich and Faour (2008) recommendations came as follow: "A controlled grazing within silvi-pastoral and silvi-horticultural systems can sustain the interest of new generation to implement and sustain land conservation measures"; as well as "improving the income of local population from agriculture, rainwater harvesting and the production of export fruits can enhance population involvement in rangeland management as a part of the ecosystem". In parallel, Sattout (2014) recommends a holistic approach for pastoralism preservation; indeed rangelands management should be institutionalized while mobilizing human resources, building capacities of stakeholders, studying rangelands ecosystem as well as vegetation carriage and protecting cultural aspects of landscapes through

empowering herders in the lands. The involvement of stakeholders, especially the shepherds, is highlighted by

SPNL's recommendations which support a participatory approach for the promotion of community-based range management. And for this aim, SPNL came up with several technical solutions among which the pressure reduction on pastures where herd size is reduced and herd management and health is improved, the degraded pastures improvement by reseeding grass lands with native species thus ameliorating pastures quantitatively and qualitatively thus reducing feed supplementation needs, the fodder shrubs plantation and the organization of pastoralists in cooperatives.

There is a need to update grazing policies and establishing new rangeland management laws based on mapping grazing routes all over Lebanon. In addition, well defined land tenure systems will enable to delineate the roles of the different stakeholders in rangeland use and will consequently enable the shepherds to efficiently benefit from rangelands pastures without harming the landscape. In addition to previous recommendations, building capacities of shepherds is of high relevance in order to identify specific responsibilities for the grazing practice, capacities, programming, and protection.

Rangelands management plans need to include grazing rotations, stocking rate, duration, monitoring of vegetation cover and water availability (Abi Said, 2018). In addition, coordinating grazing lands allocation to shepherds' herds will "resolve the conflict among them, release the tension among them and give them more access to rangelands".

UNDP (2019) in their workshop recommend taking into consideration "the multiple uses of rangelands including livestock production, recreation opportunities, wildlife habitat or secondary products of rangelands (medicinal and aromatic plants, mushrooms, honey, edible greens, fruits etc.)" when managing rangelands. And to reach a sustainable grazing, it is proposed to adopt a moderate grazing scheme with the forage consumption of around 40-60 % of total production. Chedid *et al*. (2018) support the idea of integrating farmers and pastoralists

in management plans since their perception would have advantageous implications when it comes to sustainable rangelands use. But for this strategy to succeed and be sustainable, governmental policies covering land tenure and pasture management, market and border regulations should be enhanced as well as financial and animal health services improved. Moreover, as stated in their SQML report (2018), UNDP propose zoning as a strategy to address overgrazing issues where the definition of special zones will be allocated to grazing flocks to feed upon without destroying the biodiversity of the land's plant fauna.

IV. Conclusion

Based on all of the above, and in according to Chedid *et al*. (2018), the small ruminants sector is largely understudied in the West Bekaa, especially in the rangelands management sector where a wide range of practices could be implemented in order to maintain rangeland health and productivity or restore degraded rangelands (Bailey *et al*., 2019). Within this context, this report constitutes a basis for discussions and consultation with all concerned stakeholders in view of implementing the Strategy 2 of the "Building the ecologic and socio-economic resilience of the Shouf Mountain Landscape by restoring and strengthening the socio-cultural fabric which sustains its biodiversity and cultural values" MAVA funded Project .

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