The Rosemary of the Oriental Region: Toward Sustainable Governance Between Local Participation and Institutional Steering

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Abstract. This article offers an analysis of the dynamics surrounding the management and valorization of rosemary stands in Morocco's Oriental region, based on a documentary review of institutional reports, expert missions, and field studies. The aim is to understand to what extent the governance framework—built on partnership contracts between the forestry administration and local cooperatives—effectively contributes to the construction of a shared territorial project that reconciles ecological sustainability, social resilience, and economic valorization. The analysis highlights the progress achieved as well as the limitations of a model still largely driven from the top down, through three lines of inquiry: the nature of the relationship between forest cooperatives and the administration, the scope of the PGI (Protected Geographical Indication) in a territorial development perspective centered on a specific resource, and the actual pursuit of socio-ecological sustainability of the rosemary stands within this governance framework.

Introduction

Rosemary is among the most extensively harvested aromatic plants in Morocco. It holds a strategic position and represents a true ecological and heritage asset, particularly in the Oriental region, where it covers nearly 500,000 hectares—more than half of the country's total potential.

In a context marked, on one hand, by challenges such as desertification, drought, and climatic hazards, and on the other, by extensive and sometimes illegal overexploitation practices driven by demographic pressure and the socio-economic vulnerability of local populations, this natural resource faces intense pressure in the Oriental region. Such pressure seriously threatens its regeneration and the long-term sustainability of the ecosystem services it provides.

Faced with this situation, the Water and Forestry Administration introduced, beginning in the 2000s, a participatory management approach based on forest management plans and

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partnership agreements established with local populations organized into cooperatives [1, p. 65]. This new approach seeks to strengthen the ecological resilience of the rosemary stands in the Oriental region while enhancing the socio-economic resilience of surrounding communities, following a logic of reconciliation between natural resource conservation and the improvement of local living conditions.

The partnership represents an institutional turning point, aiming to establish a framework of shared responsibility grounded in a “win–win” relationship built around concerted, negotiated, and contractual projects between the State—which ensures the sustainable management of rosemary resources—and the cooperatives, which gain secure access to the resource and new economic opportunities [2, p. 13].

This article offers a critical analysis of the dynamics surrounding rosemary management in the Oriental region, based on a documentary review of institutional reports, expert missions, and field studies related to its exploitation and valorization. The guiding thread of this critical reading is to provide elements for reflection that help understand to what extent this management framework—centered on partnership contracts with forest cooperatives for the protection, exploitation, and valorization of rosemary stands—effectively contributes to the construction of a shared territorial project that reconciles ecological sustainability, social resilience, and economic valorization.

1 Conceptual Framework

1.1 Ecosystem Services

The planet’s ecosystems provide essential benefits for human well-being, known as ecosystem services (ES). This concept, developed within the biological sciences, emphasizes the interdependence between human beings and natural environments. Ecosystem services are increasingly considered in management processes due to their importance for the sustainability of human well-being, as well as for present and future economic and social development. Indeed, Díaz and al. define them as “the benefits provided by ecosystems that contribute to making human life possible and worth living” [3, p. 1301].

In order to operationalize the concept, several typologies have been proposed to distinguish the different types of ecosystem services. Among these, the Millennium Ecosystem Assessment (2005) classification remains the most widely used, distinguishing four main categories: provisioning services, which include material goods such as food, water, wood, fibers or genetic resources; regulating services, relating to the management of climate, floods, diseases, water quality or waste treatment; cultural services, which encompass recreational, aesthetic and spiritual dimensions; and finally supporting services, which include all the ecosystem properties enabling the realization of the other three categories including soil formation, pollination and nutrient cycling[4, p. 39].

Moreover, interactions exist between ecosystem services, which can take the form of trade-offs (the improvement of one service at the expense of another) or synergies (several services improving simultaneously). Understanding these complex relationships—varying across time and space—is essential for informed environmental management. It allows the anticipation of different scenarios (win–win, win–lose, etc.), especially when strategies aim to optimize one service at the expense of others, as in intensive agriculture, which often maximizes provisioning services to the detriment of regulating ones. However, current knowledge about these dynamics remains limited and must be further developed to fully integrate ecosystem services into environmental impact assessments [5, p. 6].

The study of ecosystem services has experienced significant growth since the 1990s, attracting increasing international attention and leading to the development of new methods for data collection and analysis. However, these services remain insufficiently integrated into research and policy decisions in Morocco. According to the Department of the Environment (2014), this is mainly due to a limited understanding of the concept, despite its essential importance for the well-being of Moroccans [6, p. 1].

Indeed, to effectively guide environmental decision-making, it is crucial to understand and assess these services by identifying their interactions and estimating their ecological, social, and economic values. Such evaluation helps to recognize their importance in public policies and to establish incentive mechanisms such as Payments for Ecosystem Services (PES). PES involves compensating stakeholders—particularly farmers and foresters—for practices that promote the preservation or restoration of ecosystems. PES thus becomes a tool for sustainable management, based on the recognition of the value of the services provided by nature. As defined by Mayrand and Paquin [7, p. 242], it is "a mechanism (…) aimed at promoting positive environmental externalities through the transfer of financial resources between the beneficiaries of certain ecological services and the providers or managers of environmental resources". We will retain this definition, as it will serve as a useful reference for linking the discussion to the resource itself and its managers.

1.2 The territorial resource

The Economic and geographical literature distinguishes between two types of resources according to theoretical approaches: given resources—derived from the neoclassical school—considered as pre-existing stocks, independent of social and territorial dynamics; and constructed resources, conceptualized within a dynamic framework by the institutionalist school, which result from a collective and territorial process rooted in social relations, local practices, and shared history [8, p. 8].

From this perspective, the economy of quality, which emerged in the 1970s, can be seen as an alternative model to standardized production. It fully aligns with the institutionalist dynamic, seeking to break away from the logics of standardization, specialization, and intensification that characterize the Fordist model [9].

The processes of product specification based on the construction of territorial resources— notably the framework developed by Colletis and Pecqueur since 1993[10, p. 997], which led to the notion of a specific resource —fall within the continuation of this alternative model.

This analytical framework is generally built on a double distinction: first, between asset and resource; and second, between generic and specific elements. Resources refer to latent potentials to be revealed or organized, while assets are factors already mobilized in economic activity. When assets are generic, their value is independent of the territorial context or production processes. Conversely, specific elements derive their value from their territorial embeddedness and their integration into local processes. It is through these processes of specification that an initially generic asset becomes enriched, acquires specific characteristics, and becomes rooted in a local context—thereby contributing to strengthening the economic value of the territory [11, p. 997].

The challenge of this type of development strategy lies mainly in the ability to identify and enhance the territory's latent potential. This valorization involves revealing often invisible resources, thereby moving beyond the traditional conception of terroir, in which human action is relegated to the background in favor of a soil understood only in its physical and geographical dimensions. From this perspective, nature constitutes the starting point, while human action intervenes only secondarily and relatively. In reality, land and the amenities of a place acquire value only through the human practices that accompany

them. Thus, while a terroir can exist without a project, it is indeed the existence of a development project that defines and gives full meaning to a territory [12].

Indeed, the process of constructing and enhancing this singularization—known as territorial resource—relies on the implementation of a project, for without mobilized resources there is no project, and without a project, no structured territory. This relationship forms a Resource–Project–Territory system, characterized by the multiplicity of intentions and actors' logics [13, p. 133].

As Colletis & Pecqueur (2018) [14, p. 1000] emphasize, "Without a particular context of territorial governance and public policy that is profoundly renewed both in spirit and in substance, the resource cannot become territorialized, and the territory cannot revitalize itself." A resource's mere localization within a territory is not sufficient to generate development effects—it must be activated, structured, and collectively supported by local actors. Only within such a framework can a specification strategy, based on the enhancement of know-how or typical products, yield tangible results. This strategy relies, among other instruments, on quality labels—which are of particular interest here—such as PDOs (Protected Designations of Origin), PGIs (Protected Geographical Indications), or other mechanisms recognizing the origin and identity of products. These labels serve as genuine levers for consolidating territorial development.

In many sectors—especially the agri-food industry—demand is increasingly oriented toward specific products, highlighting labeling processes based on quality and/or geographical origin [15]. However, for a product to become a territorial resource, its specific qualities linked to its place of production must be recognized as non-reproducible elsewhere. This requires a collective dynamic driven by strong territorial governance, capable of building and legitimizing the link between the resource and its territory. Within this framework, Geographical Indication (GI) plays a central role to: identifying the product, promoting its origin, and ensuring its recognition in the market as an expression of rooted local know-how [16].

According to the Food and Agriculture Organization (FAO), the protection of a Geographical Indication (GI) relies on the establishment of a product specification document, which defines the rules for the label's use. This document specifies the product's unique characteristics, the geographical area concerned, and a quality assurance system that integrates environmental and socio-cultural sustainability criteria. Developing such a document requires a structured territorial governance system that brings together all stakeholders in the value chain. This organization is essential not only to ensure coordination, traceability, and compliance, but also to foster innovation and collective responsibility around the product [17].

1.3 Territorial Resilience

Originally, the term resilience comes from the field of mechanics, where it refers to the ability of a material to regain its original shape after experiencing a shock. By extension, it has been applied to various contexts—physical, biological, psychological, economic, and political—to describe the capacity of a system to withstand disturbance and reorganize without losing its essential functions [18, pp. 7–8].

However, the concept of resilience took a significant turn in the 1970s, as a reaction to the classical management of natural resources. It challenged orthodox approaches to economic growth and emphasized the ability of systems to adapt and thrive in the face of disturbances [19]. Moreover, the publication in 1973 by Canadian ecologist Crawford Holling of his article "Resilience and Stability of Ecological Systems" is considered a major milestone in the dissemination of the concept of resilience. Indeed, this work laid one of the foundations for the systemic approach applied to climate and environmental change

[20, p. 170]. It introduced a perspective of evolving systems capable of absorbing shocks, as opposed to stable systems [21, p. 3].

By warning against the dangers of management strategies focused on maximum sustained yield—which assume it is possible to harvest a fixed quantity of resources without compromising an ecosystem's regenerative capacity—Holling emphasized that such approaches can weaken ecosystems by reducing their resilience. He defined resilience as "the capacity of an ecosystem to maintain its coherence despite major disturbances, or the ability of that system to absorb changes in state, controlling variables, and parameters while remaining functional" [22, p. 316].

Holling also distinguished stability from resilience. Stability refers to a system's behavior in the immediate vicinity of its equilibrium state—that is, its ability to remain there or to return quickly after a disturbance. Resilience, by contrast, concerns the dynamics of systems subject to broader fluctuations but still evolving within defined limits. From this perspective, a system is said to be in equilibrium as long as its components (such as population levels or physico-chemical parameters) remain within a tolerable range of variation, delimited by what Holling called a "basin of attraction." In this sense, resilience is defined as the system's capacity to remain within this basin—that is, to maintain its functioning without crossing critical thresholds that would push it toward another equilibrium regime [23].

Holling's work on resilience, by breaking with a conception of nature as separate from human influence, led to a paradigm shift that integrated social and human dimensions into ecological thinking. Ecosystems are now understood as socio-ecological systems, an integrated perspective that profoundly transforms analytical approaches in ecology [24, p. 55].

In this extended framework, resilience no longer concerns only ecological systems but also social systems. According to the United Nations (Inter-Agency Secretariat of the International Strategy for Disaster Reduction, Geneva, 2004), the resilience of a social system is determined by its capacity to organize itself to learn from crises, better protect itself, and more effectively reduce risks [25, p. 48].

This interconnection between ecology and society finds a particular resonance in the thinking of Christian Lévêque, for whom conservation does not consist in excluding humans from natural environments, but rather in ensuring the long-term viability of ecosystems by integrating human activities into management strategies. However, conservation projects based on technocratic approaches, often led by actors external to the territories concerned, have tended to overlook local socio-economic dynamics, traditional management practices, and endogenous knowledge systems. Such approaches have frequently generated conflicts over resource use, tensions surrounding access, and—paradoxically—processes of environmental degradation and social exclusion [26, p. 103].

Furthermore, Lallau (2011) proposes a conceptual framework that leads to a vision of sustainability less centered on ecology than that proposed in socio-ecological systems analyses. Drawing on authors such as McEntire, he even suggests replacing the notion of sustainable development with that of "non-vulnerable development" [27, p. 171], which emphasizes the central role of social factors in any sustainability trajectory.

This observation highlights that ecological resilience cannot be strengthened without strong social resilience. The sustainability of an ecosystem—in this understanding—depends not only on its biophysical properties, but also on the capacity of societies to develop participatory management systems, mobilize local knowledge, and maintain a balanced relationship between human needs and nature conservation. In this sense, social resilience acts as a prerequisite for the emergence and stability of ecological resilience.

2 Oriental rosemary: from ecosystem services to territorial resource

The management of rosemary in the Oriental region combines ecosystem services, participatory governance, and PGI (Protected Geographical Indication) labeling. Understanding the components and interactions of this new management framework thus becomes essential in order to examine, in the following section, whether the attempt to transform rosemary from a natural resource into a territorial resource has truly succeeded, and whether it ensures local resilience in the face of ecological and socio-economic pressures.

2.1 The ecosystem services of rosemary: between ecological functions and local uses

The rosemary plains of the Oriental region cover a mapped area of over 450,000 hectares, with estimates suggesting that the actual surface exceeds 600,000 hectares [28, p. 16]. They form an ecosystem with multiple functions, providing provisioning, regulating, and cultural services.

The rosemary formations in the Oriental region offer a wide range of provisioning services. They constitute a strategic resource for the production of dried leaves and essential oils, with an extraction yield of around 3% of dry matter and a satisfactory quality [29, p. 64]. These formations also serve as a source of woody fuel (wood from dead rosemary shrubs collected by local populations), which is freely available [30, p. 59], and as an excellent forage plant used as pasture for goats and sheep, both by nomadic and sedentary herders, in a region where pastoral plants have become increasingly scarce due to prolonged droughts and an arid climate [31, p. 10; 32, p. 54].

The rosemary fields are also essential to the development of local beekeeping, providing a favorable habitat for bees. Beekeepers and land users are thus encouraged to coordinate their practices to ensure the maintenance of bee populations [33, p. 19]. Moreover, rosemary is classified among the main nectar-producing species, and the honey derived from it is highly valued by consumers in the Oriental region [34, p. 10]. Since 2018, it has even been the object of a PGI label (“Miel du Romarin de l’Oriental”), encompassing 26 communes across three provinces (Taourirt, Jerada, and Figuig).

From an ecological standpoint, rosemary formations play a key role in the protection and regeneration of the region’s fragile environments. By stabilizing calcareous soils and limiting runoff, they help reduce water and wind erosion. Their presence also promotes biodiversity, providing suitable habitats for numerous plant and animal species. Additionally, rosemary improves soil fertility and enhances the hydrological regime by facilitating water infiltration and retention. Their carbon sequestration capacity contributes to climate change mitigation, while their role as permanent vegetation cover helps reduce deforestation and improve local microclimates [35, p. 35]. Thus, the rosemary plains serve as a vital ecological barrier, helping to combat desertification and global warming, while maintaining environmental balance and ecosystem resilience in the semi-arid landscapes of the Oriental region [36, p. 19].

Beyond its economic value, rosemary from the Oriental represents a strong cultural and territorial identity, deeply rooted in local knowledge and traditions. This cultural service is closely linked to the efforts aimed at transforming this natural resource into a territorial resource, symbolizing sustainable development and exemplifying the synergy between nature conservation and local economic activities. The recognition of these multiple ecological, social, and economic functions has prompted public authorities to rethink the

management of rosemary within a more participatory framework, paving the way for collective and coordinated local governance.

2.2 Towards participatory and sustainable governance of rosemary stands

Following a diagnostic that highlighted the negative externalities resulting from the exploitation of rosemary plains by private actors through public auctions—both on the resource itself and on local communities—the High Commission for Water, Forests, and the Fight against Desertification (HCEFLCD) initiated, in 2006, a reform of the exploitation system. This reform aimed to replace private operators with user cooperatives. This institutional reconfiguration, based on the participation of local rights holders, led to the emergence of collective structures composed of local actors, with the goal of strengthening local governance dynamics and promoting a sustainable and participatory management of the resource [37, pp. 11–12].

As part of its national strategy, the forest administration made the sustainable management and valorization of non-wood forest products (NWFPs) a key priority, with special attention to rosemary. This orientation is embedded in an integrated approach to forest ecosystem restoration, seeking to reconcile ecological conservation objectives with the socioeconomic development of forest and peri-forest areas. To operationalize this vision, a participatory forest management approach was implemented, with the objectives of conserving and regenerating rosemary plains, enhancing the value of derived NWFPs (such as dried leaves and essential oils), and structuring the local value chain to optimize value creation and strengthen user organization around this resource [38, p. 7].

Among the key requirements for the sustainable management of rosemary areas is the organization of users into cooperatives or associations, promoting participatory and lasting management of these ecosystems [39, p. 66]. In this regard, cooperatives dedicated to the exploitation and valorization of rosemary—within the framework of partnership agreements with the forest administration—were established. These cooperatives were entrusted with the entire valorization process, from collection to marketing, and in some cases, to product transformation. These collective structures gradually replaced the individual private exploitation model, which had been deemed little benefit for local users and harmful to the resource [40, p. 13].

Within this context, the new regulatory framework governing the exploitation of rosemary plains introduced several major innovations. Among the most significant is the extension of concession periods to nine years, corresponding to nine harvesting campaigns, structured around a three-year rotation system: one year of exploitation followed by two years of vegetative rest, thereby promoting the natural regeneration of rosemary stands. Moreover, the new Special Terms and Conditions (CPS) document, which regulates the technical and environmental modalities of exploitation, prohibits harmful practices such as uprooting shrubs, and requires the use of pruning shears instead of sickles, along with other measures aligned with the principles of sustainability and resource conservation [41, p. 17].

2.3 Rosemary Protected Geographical Indications (PGIs): an attempt at territorial valorization

Following the implementation of a more participatory management system for the rosemary stands, this first phase of cooperation paved the way for a second stage of territorial valorization, marked by the official recognition of two Protected Geographical Indications (PGI): Dried Rosemary Leaves of the Oriental region and Rosemary Essential Oil of the Oriental region, labels intended to enhance its recognition and consolidate the territorial dynamics initiated.

Indeed, these labels, which fall within the framework of the Green Morocco Plan (Ministry of Agriculture), the national strategy for the development of spontaneous aromatic and medicinal plants (HCEFLCD), and Law n°25-06 on distinctive signs of origin and quality (SDOQ), also reflect a desire to transfer research and development results to cooperatives and local industries, given that the socio-economic environment of the Oriental region is highly favorable for such transfer, according to the HCEFLCD [42, p. 4].

Thus, these PGI labels are supposed to consecrate the ecological and cultural typicality specificity of the resource by linking product quality to its geographic origin and to strengthen collective governance of the resource, by regulating production, processing, and marketing practices through a strict specification including sustainability and traceability requirements. This governance framework, in which the cooperative acts as a mediator between market and conservation logics, helps consolidate provisioning ecosystem services (production of leaves and essential oils) while preserving regulatory and socio-cultural services associated with the rosemary stands.

According to their specifications (CDC), these labels aim, among other things, to increase the added value of rosemary by providing access to specialized distribution channels, boosting rural household incomes, promoting good production and processing practices, and creating direct links between producers, distributors, and points of sale, thereby strengthening the local economy. However, this depends on structuring the supply chain around a central actor, namely forest cooperatives responsible for collection and harvesting, with the goal of reducing intermediaries, optimizing packaging and marketing, while ensuring quality in accordance with the CDC [43, p. 6].

It is clear that obtaining a PGI label represents a strategic step, aiming to position this product on national and international markets as a specific, non-reproducible asset. The label enables differentiation based on the recognition of unique, non-replicable characteristics, offering an alternative to price competition for the actors involved, while aligning—with Berriane's words (2025)—with the ideology of sustainable development by integrating social and environmental concerns [44, p. 316].

Indeed, this labeling initiative reflects the intention to construct a specific territorial resource, where nature, local knowledge, and institutional frameworks converge within a dynamic of territorial resilience—economic, ecological, and social—in the face of climatic shocks, market uncertainties, and rural vulnerabilities.

While the evolution of rosemary management in the Oriental region is presented as a participatory dynamic for territorial preservation and valorization, it remains legitimate to question the actual impact of this labeling process, as well as the nature of the forest cooperative's involvement: is it truly a central actor in a collective construction, or rather an operational tool of an institutional agenda for sustainable management?

3 Territorial dynamics around rosemary in the Oriental region: device, labeling and impact

This third axis offers a cross-analysis between the conceptual framework employed and its practical implementation in the Oriental region. Three complementary dimensions will be examined: the role of forest cooperatives, or more broadly the position of social and solidarity economy (SSE) actors within this framework; cultural and identity anchoring the Rosemary PGI and the associated risks of standardization; and finally, the effects in terms of territorial sustainability and resilience.

3.1 The Romarin forestry cooperative: partner or tool

By replacing private operators in the exploitation of rosemary plains, the forest cooperative has emerged as a central actor, serving as an interface between local users, public institutions, and markets.

In this context, the cooperative model ensures that the wealth generated remains largely localized, since membership criteria for forest cooperatives impose strict conditions — including a minimum of 20 members for cooperatives involved in the valorization of aromatic and medicinal plants, as specified by HCEFLCD Circular 2166 (2010). Members must also actively participate in productive activities, particularly through their own labor contribution, and, most importantly, must be resident rights holders [45, pp. 11–12]. This requirement theoretically ensures that economic benefits remain anchored within the local community.

Furthermore, Article 6 of Law 112-12 on cooperatives limits to 30% the share of work that can be carried out by non-members. These individuals, who are primarily local communities with rights to forest resources but excluded from redistribution and decision-making mechanisms, are thus gradually encouraged to formally join the cooperative, given that 30% of the harvesters are women who report rosemary as their sole source of individual income [46, p. 43]. This measure aims to strengthen internal equity, the integration of local rights holders, and consequently, the sustainability of cooperative structures.

However, despite the growing recognition of the role of cooperatives in the sustainable management of natural resources, it is important to question their actual autonomy and their place as actors in the social and solidarity economy (SSE). In the case of forestry cooperatives operating in the rosemary sector, their emergence -with a few exceptions- results less from a bottom-up dynamic driven by the users themselves than from an institutional initiative led by the water and forestry administration. According to an expert report [47, p. 32], the administration acts as the sole contracting authority, thus maintaining these cooperatives in a situation of structural dependence. Consequently, the development of forestry cooperatives appears to be primarily determined by the priorities and constraints of the public sector, rather than by a logic of community empowerment or local initiative.

Another manifestation of this dependency lies in the contractual clauses. For example, when renewing partnership contracts with rosemary cooperatives in the Oriental region, royalties owed to the state were to increase by 10 percent, while the unit value of services provided by members remained unchanged, according to the same report [48, p. 34]. Such a configuration, which fails to account for changes in the cost of living or pay equity requirements, reveals a contractual imbalance. Moreover, the uncertainty surrounding contract renewal periods—sometimes up to a year—weakens the cooperatives and hinders their ability to establish stable partnerships and plan their investments, thus confirming the finding of dependency. To address this instability, the report recommends the automatic renewal of contracts before their expiration, in order to ensure business continuity and strengthen buyer confidence [49, pp. 44–46]. This is a relevant measure, but it is only a technical adjustment, far from a real overhaul of the balance of power to establish a certain institutional equilibrium.

This situation invites reflection beyond the narrow framework of the cooperative–forest administration relationship, raising deeper questions about the actual role granted to SSE actors within the national socio-economic landscape. These concerns echo theoretical debates on the relationship between the SSE and other economic logics, particularly the persistent tensions between market, non-market, and non-monetary systems.

Indeed, the social and solidarity economy (SSE) is often perceived as an economy that compensates for the shortcomings of capitalist enterprises and the state. This perception is rooted in the American approach to the "third sector," which stems from neoclassical

economics. In this view, the SSE is considered complementary—or even corrective—to the deficiencies of the private and public sectors [50, p. 7]. Even in its most favorable interpretations, viewed through the lens of contractual approaches derived from New Public Management, the relationship between the third sector and the state is primarily considered in terms of outsourcing public services focused on efficiency and performance. This instrumental vision reduces these relationships to mere management tools, prioritizing efficiency and performance at the expense of social, political, and relational dimensions [51].

This interpretation gains further relevance given that the HCEFLCD explicitly seeks to transform forest cooperatives into small, competitive enterprises [52, p. 13]. This orientation instrumentalizes cooperatives by aligning them to market-preparation logics, suggesting that the SSE is viewed less as an alternative model promoting reciprocity and collective resource management, and more as a transitional mechanism to compensate for public-sector limits and supplement private-sector operations. This view has clear ideological roots: as noted by Jean-Louis Laville, it echoes the ideas of Friedrich Hayek, who argued that most associative activities should ultimately be transferred to private enterprises, deemed more efficient, leaving only a charitable, non-political third sector [53, p. 27]. From this perspective, the market logic subordinates solidarity, reducing the SSE to an adjustment tool rather than a driver of socio-economic and territorial transformation.

This corresponds with Léa's (2006) analysis, which argues that under the guise of "governance," policymakers sometimes engage in symbolic manipulation of civil society: the stated principles of participation, consultation, and negotiation serve merely to legitimize pre-decided actions [54, p. 99].

However, the actual operation of forestry cooperatives reveals that they partly reproduce market logics. First, the limited number of members—only 1,234 within a large user population—indicates that the majority of local users remain excluded—by the cooperative managers—from participatory management, even though this is theoretically at the heart of the strategy [55, p. 15]. Second, the cooperatives often informally use non-member collectors, issuing them temporary work permits to circumvent regulations [56, pp. 63–64]. Such practices demonstrate that these cooperatives prioritize maximizing production flows and economic returns over promoting reciprocity and solidarity, the founding principles of the social and solidarity economy (SSE). Consequently, the current cooperative model tends to reproduce the market dynamics it was supposed to regulate, thereby compromising collective ownership, social inclusion and the long-term sustainability of forest resources.

3.2 The labels of the Oriental region rosemary, or the territorial development under administrative supervision

The labelling of rosemary from the Oriental region through two Protected Geographical Indications (PGIs) represents a major step forward in the recognition and territorial valorization of this resource. However, it raises several questions regarding its actual scope and impact.

Among the HCEFLCD's objectives is the desire to promote the formation of cooperatives to enable rural communities to benefit from natural resources, while supporting the transition from a sector supplying unprocessed raw materials to a fully developed industrial sector. This orientation, based on modernization and industrialization, aims to develop high-quality, high value-added local products destined for both national and international markets, and to mobilize the significant value-creation potential through partnerships between the HCEFLCD, cooperatives, and the private sector [57, p. 39] ; [58, p. 5]. Yet this orientation reflects a tension between two logics: on the one hand, standardization and economic competitiveness; on the other, territorial specificity and the

valorization of local know-how. In seeking to industrialize the sector, public policy risks weakening the identity-based and heritage dimensions of specific products, thereby contradicting the very purpose of territorial labelling.

More generally, the labelling of local products within the framework of the Green Morocco Plan (Pillar II), which mobilizes rural actors (producers, cooperatives, economic interest groups, and associations), has generated significant momentum in this area. While this dynamic appears effective in structuring value chains, enhancing market valorization (including at the international level), and protecting against imitation and counterfeiting, it also confirms our previous conclusion, as it reveals the limitations of a top-down approach driven mainly by public institutions.

Indeed, the goal of enabling these communities to valorize their diversity and initiate a genuine process of rural renewal—similar to what can be observed today in many rural territories of Northern countries—while curbing further resource degradation and massive rural exodus, which particularly affects this region, is still far from being achieved [59, pp. 319–320].

Thus, the label, intended to anchor the product in a unique local identity, risks losing part of its cultural and symbolic foundation to a top-down approach that tends to standardize products and define the geographical boundaries of the label—which we will discuss later—on administrative rather than socio-territorial grounds. Such a mode of governance often limits the ability of local communities to take ownership of the label, as they find themselves integrated into a process that transcends them and that they have not truly helped to create.

Furthermore, the large geographical area covered by the label, encompassing highly diverse social and cultural territories (see Figure 1 below), tends to dilute the territorial specificity that the PGIs for Oriental rosemary — like many similar labels — are meant to uphold. From the perspective of territorial specification and local embeddedness, this spatial breadth instead risks weakening the connection between the product, the local knowledge that defines it, and the territorial identity it is supposed to embody.

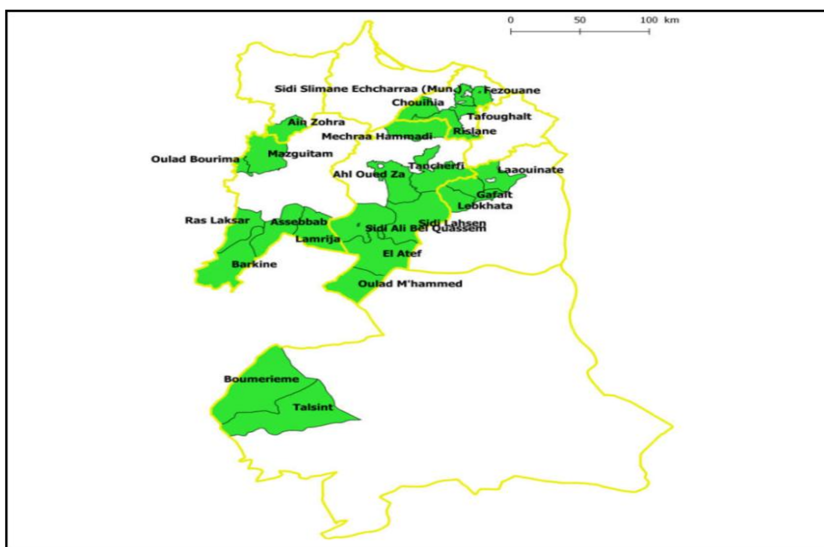

Fig. 1. The geographical area covered by the PGI by rural municipality.

Yet one of the fundamental principles of geographical indication systems is that the terroir must be defined before the product associated with it. This definition must be built in

close connection with the local communities who shape and sustain it, since a terroir product can only exist through its territorial and cultural anchoring. The terroir therefore pre-exists the qualification and valorization of its products: it rests on a biocultural heritage that expresses the unique relationship between a society, a place, and its resources — a relationship that is rarely made explicit in the Moroccan context. Indeed, current policies tend to define the terroir by its products or landscapes, rather than by the practices, know-how, and histories that have shaped them. This leads, in several cases — including that of rosemary — to a gradual dissociation between the product and its territory. In this case, the product loses its cultural and symbolic grounding in favor of a market-oriented logic [60, p. 327].

From this perspective, the National Institute of Origin and Quality (INAO) stresses the importance of preserving the "mystery" that underlies the creation of appellation-of-origin products. It promotes a conception of terroir that goes beyond its natural attributes to encompass the weight of history, customary practices, and traditional know-how transmitted from generation to generation. For this French institution, terroir and tradition are thus inseparable, reflecting an approach that departs from a strictly geographical definition of terroir — as a place defined by specific physical characteristics (slope, soil, exposure, microclimate) — and instead highlights its cultural and heritage dimensions [61, p. 229]. In other words, by moving beyond the narrow notion of agro-terroir to include its socially constructed dimension, the terroir refers to the set of relationships a society maintains with its territory — relationships that must be demonstrated and substantiated — while also encompassing environmental concerns related to biodiversity and ecosystem services [62, p. 320].

Although two ministerial decrees from the Ministry of Agriculture and Maritime Fisheries (MAPM) – Nos. 3579-15 and 3580-15 – legally recognizing the two Protected Geographical Indications (PGIs) for "dried leaves of Oriental rosemary" and "essential oil of Oriental rosemary" designate the *"Béni Yaâla Zkara"* cooperative as the applicant for both labels, discrepancies appear in the documentation, reports, and catalogs of labeled products (comparison of the 2015 and 2019 editions). Some sources attribute the initiative to the cooperative, while others associate it with the Regional Directorate of Water and Forests and Combating Desertification in the Oriental region. This ambiguity is not a mere administrative detail; it reveals a deeper uncertainty regarding the governance of the labeling process for this resource.

One might therefore wonder whether this ambivalence reflects an institutional attempt to give a vertical process the appearance of genuine local roots. By legally (and symbolically) designating the oldest cooperative (since 1962) [63, p. 99] and the one with deep local roots as the official applicant body, the administration seems to want to legitimize a largely vertical approach under the guise of community initiatives. However, while this initiative demonstrates an awareness of the need for local roots in development publics policies, it simultaneously reveals their limitations, since this local facade neither masks the weak appropriation of the process by local actors, nor the inconsistency between the geographical extent of the area covered by the two PGIs – which spans several provinces – and the limited scope of action of the applicant cooperative, confined to the rural commune of El Aouinate, in the province of Jerada.

The awarding of the PGI to this cooperative, however, warrants some explanation. For the Essential Oils PGI, this designation is partially justified, as the cooperative owns a distillation unit and purchases biomass from several other cooperatives, thus playing a central role in distillation [64, p. 47]. Nevertheless, even in this case, the justification remains partial for this label, while for the Dried Leaves PGI, it disappears entirely.

Drawing on the work of researchers, policymakers, and experts, Berriane [65, p. 326] argues that rural tourism can be a powerful lever for promoting local products, particularly

those with a geographical indication (GI), thus fostering synergy between tourism and local products. Several studies have indeed demonstrated that tourists seek a range of local goods and services specific to each area they visit, valuing—through their interactions with local stakeholders—the territory as a valuable resource in its own right. This dynamic creates a virtuous circle where tourism and local products mutually reinforce each other, contributing to a win-win territorial strategy.

However, in the case of oriental rosemary, the vast geographical area of the GI weakens this potential link between tourism and specific products. By diluting the cultural and ecological specificity of the product, it compromises the depth of its territorial roots and limits the emergence of a genuine synergy between tourism, local identity, and the promotion of a coherent territorial offering of goods and services.

3.3 Sustainability of Oriental rosemary and socio-ecological resilience

While being aware that assessing the true added value of the partnership mechanism implemented by the Départment of Waters and Forests in terms of ecological sustainability is not limited to a simple comparison of the condition of rosemary plots managed by these cooperatives, it is necessary to evaluate the condition of rosemary stands managed under cooperative contracts compared to those remaining outside this system. In other words, for a complete assessment of the impact of this mechanism, it is essential to know how the resource would have evolved in the absence of this new management approach.

From this perspective, our analysis in this section aims, firstly, to illustrate – through selected examples – the importance of community and cooperative ownership of the management system, an essential condition for effective sustainability. Secondly, it aims to offer analytical perspectives that allow us to distinguish the relative impact of cooperatives arising from genuine local dynamics from that of cooperatives created primarily to comply with contractual obligations. This distinction is crucial for understanding to what extent cooperation constitutes a true driver of sustainability and not simply a tool for administrative implementation.

Although the rotation system implemented for rosemary harvesting demonstrates a clear commitment to promoting sustainable resource management, its implementation raises several social challenges. Many cooperatives contest the delimitation and layout of harvesting plots, arguing that the current configuration makes it difficult for harvesters from the same douar (village) to access plots open for harvesting. Consequently, these harvesters are often forced to travel long distances or turn to neighboring areas, regardless of their status [66, p. 21], which runs counter to the three-year rotation system requiring strict adherence to harvesting cycles to allow for natural regeneration of the resource. However, these spatial constraints sometimes lead to violations of the rotation rule, with some harvesters favoring easily accessible areas or areas with denser vegetation [67, p. 28]. Nevertheless, most of the technical and temporal restrictions related to harvesting appear to be relatively well respected [68, p. 26].

Such situations highlight that ecological sustainability cannot be guaranteed without genuine social ownership of management practices, as we outlined in our conceptual framework. In other words, the ecological resilience of rosemary stands is closely linked to the social resilience of the communities that depend on them. Without dialogue, trust, and the effective participation of cooperatives, regeneration mechanisms risk being bypassed, thereby jeopardizing the stability of the entire socio-ecological system.

Furthermore, the partnership is based on a service contract (guarding, forestry work, and road maintenance), the value of which is deducted from royalties owed to the state [69, p. 40]. However, the implementation of this system remains limited, as certain actions—such as creating watering points, pruning, or thinning—are considered beyond the technical

capabilities of the cooperative members. Consequently, they wish to be fully involved in defining and prioritizing the actions to be undertaken, favoring those that contribute directly to the preservation, regeneration, and restoration of rosemary stands, and insisting that these interventions be carried out on the plots they manage [70, p. 30]. Thus, a jointly defined framework of priorities and ecosystem services appears essential to strengthening the ecological sustainability and social resilience of local communities.

The action program should therefore prioritize measures directly related to the preservation and regeneration of rosemary stands, such as rejuvenation cuttings, natural or assisted regeneration of degraded areas, planting in gaps, and the maintenance and protection of the forest area (maintenance of paths, marking of boundaries, fire prevention). These interventions, adapted to regional specificities, contribute not only to the restoration of stands, but also to the conservation of soil and water, thus promoting the ecological sustainability of the territories concerned [71, p. 38].

Indeed, by focusing on measures directly related to the plots they operate under partnership contracts, cooperative members develop a genuine sense of belonging and attachment to the resource, reinforced by the awareness that the preservation and regeneration efforts they undertake today will benefit their own community in the future – a logic fully aligned with the philosophy of sustainable development.

Such a territorial project can only succeed if local actors truly take ownership of its issues, because even institutionally legitimate practices can be rejected if they are perceived as illegitimate by the population. Participation thus becomes a means of appropriation and legitimation, making it possible to "humanize" conservation and the inclusion of the weakest actors – those who have limited resources to defend their interests, their choices and their moral values – in the construction of the socio-environmental project [72, p. 104].

In this context, the case of the cooperative already mentioned, the only existing forestry cooperative before the implementation of the partnership system for rosemary harvesting in 2006 [73, p. 16], illustrates the importance of endogenous dynamics in the sustainable management of rosemary. Its plot exhibits the lowest mortality rate (12%), compared to 15–19% for the plots of other cooperatives. This observation is confirmed by the fact that 90% of the recorded mortality is attributed to natural causes, meaning that only 10% of the dying plants are due to poor harvesting practices and unsuitable tools, compared to 40–60% in the plots of other cooperatives. Similarly, it is distinguished by a better respect for harvesting standards, in particular the rule stipulating that the cutting height should not exceed 50% of the total height of the clump, a standard which has been respected, at least in part, only in the lot managed by this cooperative, while in the lots of cooperatives created by administrative initiative, severe cutting and destructive practices are frequent [74, pp. 57–59].

One could assume a learning effect linked to the duration of the partnership, which dates back to February 2006 for this cooperative, while contracts with other cooperatives only began between 2011 and 2016 [75, p. 18]. One could also assume that this performance reflects a local appropriation of management rules and a cooperative whose governance is truly rooted in the territory. This suggests that the sustainability of the resource depends more on community autonomy and local commitment than on vertical institutional mechanisms.

This autonomy and community engagement also seem to foster a spirit of innovation in the valorization of rosemary, since this cooperative has indeed planned to diversify its activities by producing rosemary-based soaps, herbal teas, and shampoos, thus seeking to generate greater added value [76, p. 16]. This initiative illustrates how an endogenous dynamic can simultaneously stimulate ecological sustainability and local economic development.

However, field data reveal that, despite these good practices, ecological sustainability remains fragile on all the plots studied by Benmessaoud, indicating an imbalance between losses and natural regeneration, even on the high-performing cooperative's plot where the regeneration rate (7%) remains lower than the mortality rate (12%). This imbalance is further exacerbated by the high proportion of old-growth stands (35%) and the near absence of rejuvenation operations, demonstrating that improvements in social and technical practices alone are insufficient to halt ecological decline [77, p. 61]. The main difference lies in the fact that the cooperatives created through administrative initiatives appear to operate according to a yield-driven logic close to the "maximum sustainable yield" model criticized by Holling, while the other cooperative—resulting from an endogenous dynamic—seems to operate in a more stable "basin of attraction," helping to delay the crossing of ecological tipping points.

These results demonstrate that while local embeddedness and community governance are necessary conditions for sustainability, they remain insufficient without structured ecological and institutional support. In other words, endogenous dynamics strengthen local resilience but cannot, on their own, reverse the processes of structural degradation induced by human pressure, vegetation aging, and the effects of climate change.

Conclusion

The analysis of the dynamics surrounding the management of rosemary in the Oriental region highlights both the progress achieved and the tensions inherent in a territorial valorization model that remains largely top-down. While forest cooperatives have enhanced the visibility of social and solidarity economy actors, their dependency on the forestry administration—combined with their own internal weaknesses—continues to limit their capacity to foster genuinely endogenous development dynamics.

It is nevertheless important to acknowledge the efforts undertaken by the Department of Waters and Forests to promote sustainable management of rosemary stands through the experimentation of new, more inclusive forms of contractual governance. These initiatives reflect a genuine institutional willingness to link natural resource conservation with local development, even though their implementation faces persistent structural and territorial constraints.

Furthermore, although it is still too early to fully assess the effectiveness of the labeling strategy aimed at conferring a territorial identity on forest and agri-food products, the case of oriental rosemary—like other similar experiences—shows that such approaches sometimes dilute this identity under the influence of standardization and industrialization. This phenomenon occurs to the detriment of local know-how and the biocultural link between the resource and its territory. From this perspective, the Protected Geographical Indications (PGIs) for rosemary are far from fully playing their role as locomotive of local development, or even as elements of a “basket of specific goods and services” capable, in the sense of Pecqueur and Campagne, of generating integrated conglomerate territorial development within the Oriental region.

In this context, the pursuit of sustainability and resilience emerges as both an ecological and social challenge: the preservation of rosemary stands, which provide essential ecosystem services, cannot be separated from the effective involvement of the communities that depend on them. The sustainability of these management schemes thus relies on genuine local ownership of the rules, participatory decision-making in setting action priorities, and recognition of the role of social and solidarity economy actors as co-managers of resources rather than mere executors of public policies.

The reflection developed in this article lies, to use Léa's words [78, p. 90], at the crossroads of an ecocentric approach to sustainable development—which places the

preservation of ecosystems and all forms of life at the heart of action—and an anthropocentric approach, focused solely on human well-being. The aim here is to argue for defends a situated rationality, adapted to territories with low economic diversification, where rosemary cultivation often constitutes the main, or even the only, source of income, sometimes representing up to 100% of household income, according to Benmessaoud [79, p. 92]. In such contexts, a reflection focused on access to a "socially acceptable level of satisfaction of basic needs" can offer a middle ground between these two approaches, particularly in marginalized areas such as those studied here.

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