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Biosphere Reserves in Lebanon: Rifts between Conservation Discourse and Practice

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Abstract: Protected areas (PA), especially biosphere reserves (BR), are considered effective instruments for nature conservation and rural development. However, their impact on rural communities constitutes the most controversial debate in conservation policy and practice. This study aims to reveal the perceptions of local communities towards conservation, the extent of the inclusion of local communities in the establishment and management of a BR and the impact of BRs on local livelihoods by exploring a case study while reflecting on major debates in the conservation and rural development paradigms. Mixed research methods focusing on qualitative methodology are used. By exploring a BR in Lebanon, this research highlights how the allocation and management of the BRs have not always reflected participatory, sustainable and community-based approaches. This study stresses the importance of the locals' engagement in the whole conservation process. By putting people, their needs and perceptions at the center of decision-making, conservation agencies would shift the main objective of BRs from conservation to poverty reduction.

Keywords: protected areas; biosphere reserves; rural development; participation; rural livelihoods



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1. Introduction

Protected areas (PA) play a significant role in the conservation of the world's habitats and the protection of biodiversity that have become highly threatened by devastating anthropocentric practices. According to the International Union for Conservation of Nature (IUCN), a protected area is "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" [1,2]. There is no single approach to conservation; instead, the more than 100,000 PAs that now exist worldwide reflect a great variety of management objectives. They vary from firmly controlled reserves where only scientists are allowed to enter to cultural landscapes where biodiversity conservation is integrated with socioeconomic and cultural activities [2,3].

1.1. Debates over Protected Areas

PAs can increase the social capital, empower communities and enhance the social cohesion and self-esteem of locals through their participatory and collaborative approaches [4,5]. A protected area can offer local communities important economic benefits as it can endorse tourism, supply economic services and improve infrastructure in remote areas [6,7]. By engaging rural communities, PAs provide opportunities for local citizens to raise their concerns and be represented in decision-making bodies [5].

On the other hand, critics argue that modernization processes and tourism development in conservation result in wrapping PAs and people in a modern market economy with capitalist relations, where profit-making and biodiversity conservation are prioritized over the concerns, needs and cultures of marginal displaced local people [8–11]. By affecting land use and land tenure, PAs impose considerable changes to local livelihood strategies, especially through confining agricultural development and exploitation of natural resources, which might further intensify rural poverty [12,13]. PAs in Nepal, for example, restricted traditional land access and land use rights, hence threatening the economic and social status of rural dwellers [14]. In many cases, poverty and the dependence on nature for survival led local communities to continue their gathering and hunting practices in areas designated for conservation which resulted in serious conflicts between the local communities and the management units of the PAs [12,13].

In the 1970s, the social impact of PAs on local communities began to be acknowledged, and the socioeconomic inclusiveness of PAs became part of the mainstream conservation discourse [6,15,16]. Aiming to foster socioeconomic inclusiveness, the United Nations Educational, Scientific and Cultural Organization (UNESCO) launched the Man and the Biosphere Program from which the “biosphere reserve” concept emerged in 1970, and now more than 700 biosphere reserves have been established in 131 countries [3]. Biosphere reserves are unique types of PAs aiming at conserving species and ecosystems, monitoring and conducting scientific research and fostering sustainable development in the surrounding region. They do not have a single management model; instead, management systems are encouraged to be open to community concerns and flexible to changing environments [2,17]. Their management is based on a zoning pattern consisting of a strictly protected core where only scientists are allowed and a surrounding buffer zone where specific appropriate socioeconomic activities are endorsed. BR’s management regime is associated with “sustainable development”, “participatory” and “community-based” approaches—core paradigms in the rural development discourse. However, these principles on which BRs are based have been highly contentious, as described below.

Despite the tendency to shift towards local participation in BRs, the redistribution of power among stakeholders has been limited. Indeed, many critics point out the limited degree of allocation of real power and authority to the indigenous and local communities in such conservation practices [18–21]. Lack of political representativeness prevents indigenous communities from having an effective voice in land management and decision-making and prevents them from effectively addressing problems of corruption that limit the benefits they receive from such reserves [22]. In Pakistan, for example, the efforts of non-governmental organizations (NGOs) to assign a monetary value to the ibex for the sake of conservation removed the ibex from local management and placed it within the control of national and international organizations [23]. Community-based conservation is regarded by its advocates as a more equitable and more efficient alternative to the various types of PAs, in addition to being perceived as a way to ensure environmental conservation beyond the boundaries of PAs [24]. However, Brockington et al. (2008) argue that community-based conservation also ends up supporting a small group of people benefiting from conservation-oriented market opportunities, while the local communities, especially the most vulnerable, suffer the consequences of conservation initiatives without realizing any significant benefit, which further introduces different sets of power inequalities within PAs [23].

1.2. Protected Areas in Lebanon

Protected areas in the Middle East are on the rise. There are more than 230 PAs in the Arabian Peninsula region covering around 15% of the land area [25]. However, research on political ecology and the impact of conservation on local communities—their livelihoods, perceptions, socioeconomic growth and decision-making power—in the Middle East is limited, lacking exploration of the impact of conservation on local livelihoods and the locals’ perceptions.

Lebanon's topography, its altitudinal diversity and its location at the far eastern end of the Mediterranean Sea have resulted in unique ecosystems and rich biological diversity [26]. Despite its small area covering 0.007% of the world's land surface, Lebanon hosts about 0.8% of the world's recorded species and includes a high percentage of endemic terrestrial and marine plant species (12%) [27,28]. However, this diversity has been highly threatened; forests currently constitute 13% of the country's area as opposed to 70% a hundred years ago [29,30]. Economic development and political and social instability have been pushing for unsustainable exploitation of natural resources [29]. As a response to these environmental threats, PAs have been allocated throughout Lebanon since the 1930s for the aim of conserving what is left of Lebanon's biodiversity [31]. Many of the natural sites in Lebanon are protected by Lebanese laws, decrees, ministerial decisions and resolutions. These sites are classified and protected as nature reserves, protected forests, natural sites and Himas (local community-based conservation practice) [32]. Today, Lebanon features at least 15 nature reserves, 18 protected natural sites, 15 protected forests, 14 protected touristic sites, eight protected natural sites and monuments, seven Himas and 42 sites of natural and ecological importance in need of protection [32–34]. Nature reserves alone occupy around 2.4% of the country's area [34]. The national biodiversity targets developed as part of the ongoing NBSAP (National Biodiversity Strategies and Action Plans) state that "by 2030, the total area of nature reserves is increased to reach at least 5% of Lebanon's area." [35,36].

The Department of Ecosystems at the Ministry of Environment (MoE) is accountable for everything related to PAs, nature reserves and nature sites; it develops the policies, regulations and governance's structure related to the nature reserves and nature sites under the MoE's protection. The Protected Area Project (1996–2002) established the framework for the management of PAs in Lebanon. The management of the PAs involves three main entities: (1) the Ministry of Environment (MoE), (2) a government-appointed committee (GAC) and (3) the management team (MT). This MoE–GAC–MT model has a vertical structure since the MoE holds the major decision-making power by approving the management plans, the budget, the annual work plans and the major activities on sites. Annual reports on management development must be presented to the MoE. The MT implements management plans under the supervision of the GAC [37]. According to a graduate study [38] on stakeholder involvement in the collaborative management of two PAs in Lebanon, this MoE–GAC–MT model removes some stakeholders from the decision-making platform, specifically resource users such as herders, fishermen and farmers. Hence, this model permits powerful holders to impose control over sites.

Studies exploring conservation dynamics and policies in Lebanon in particular and the Middle East in general are scant. Although conservation in Lebanon has witnessed a growing trend, the perception of people towards conservation and the socioeconomic impact of PAs on rural livelihoods have been poorly investigated. Considering the contentious character of the establishment of PAs in the Global South and the contrasting analytical perspectives which have underpinned the analyses of these and other conservation initiatives, this study interrogates: (a) the perceptions of rural communities about conservation practices and about the making of Jabal Moussa in Lebanon into a protected area, (b) the extent and form of their involvement and participation in this conservation and rural development project and (c) the implications for reproduction of the existing rural livelihoods.

2. Materials and Methods

2.1. Study Site

Jabal Moussa Biosphere Reserve (JMBR) is located in the Kesrouan District at an altitude ranging between 350 m in the northwest and 1700 m to the southeast. It covers an area of 6500 ha with a core area of 1250 ha (Figure 1). Jabal Moussa is located within or surrounded by seven main villages: Yahchouch, Amez, Jouret el Thermos, Nahr ed Dahab, Ghbale, Aabri and Chouwan. According to Abi Habib Khoury (2009), the main economic ac-

tivities in the villages surrounding Jabal Moussa included services (commercial/industrial) (57%), construction (20%), agriculture and charcoaling (12%) and intellectual services (education, art) (10%). In 2008, Jabal Moussa and the surrounding villages became part of the UNESCO Network of Biosphere Reserves under the Man and Biosphere (MAB) program. JMBR addresses nature conservation as well as rural community development through integrating natural sciences with education and social sciences [39]. Jabal Moussa is different from other PAs delineated in Lebanon by being mostly Waqf land. The Lebanese legislation recognizes nature reserves on public lands only. However, through funding lease contracts with Church endowments to rent a large area of the mountain and by turning to various international organizations, the Jabal Moussa management team was capable of convincing the Lebanese Government of the importance of the site which was then protected under legislative laws for natural sites, protected forests, and protected natural sites. Jabal Moussa became a UNESCO Biosphere Reserve in 2008 and a Global Important Bird Area (acc. to the BirdLife International criteria) and a member of the IUCN in 2009 [40].

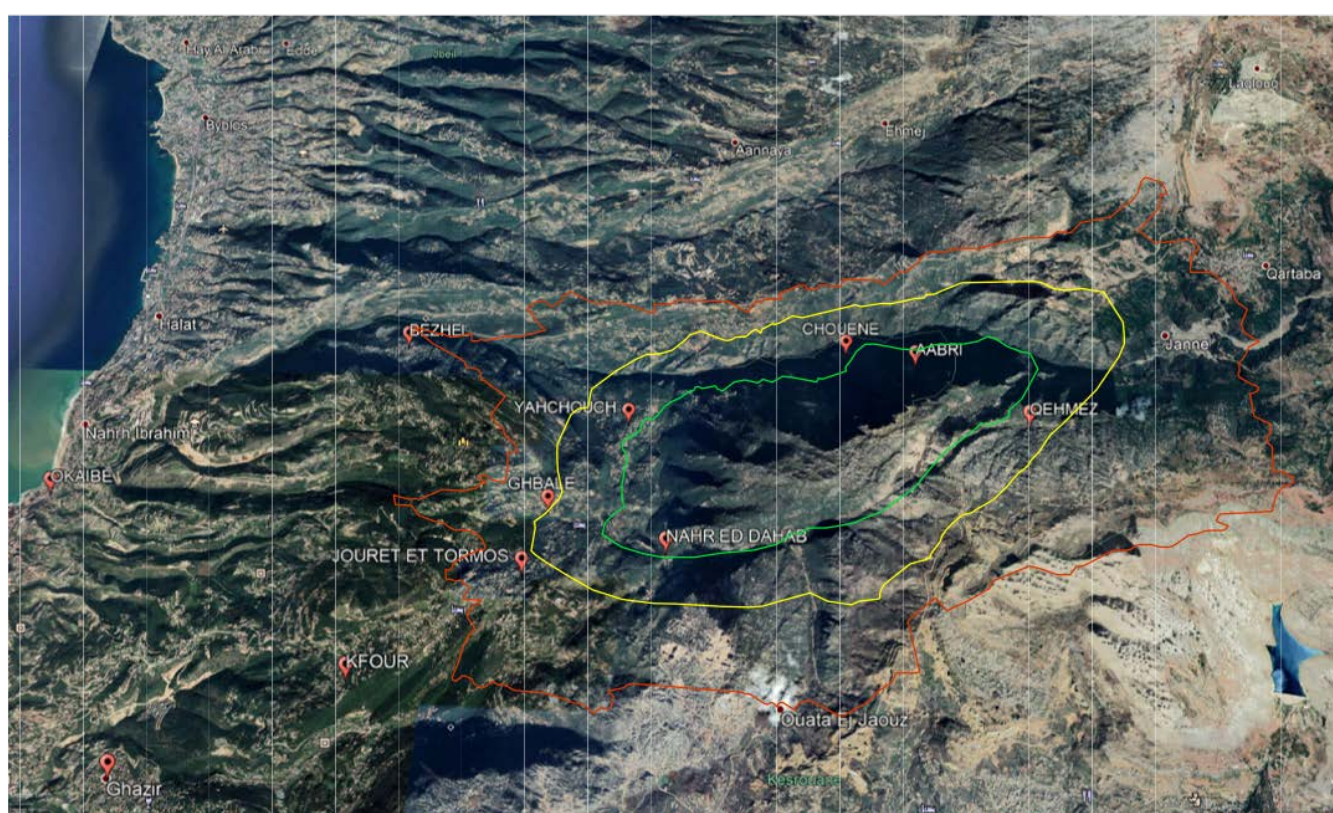


Figure 1. Jabal Moussa Biosphere Reserve’s boundaries (green: core area; yellow: buffer zone; red: development zone). The map was sketched using Google Maps. The coordinates of the reserve’s boundaries were adopted from <https://www.spnl.org/jabal-moussa-2/> (accessed on 5 November 2021).

2.2. Research Methodology and Case Study

Jabal Moussa being a biosphere reserve, its management system is supposed to be affected by the increasing trends of local participation and local empowerment. Jabal Moussa was chosen for this study in order to check the usefulness of such integration.

The methodology adopted for this study was influenced by the Sustainable Livelihood Framework (SLF) which allows for place-based, context-specific empirical inquiry. The SLF is an instrument used for the investigation of poor people’s livelihoods by exploring the main factors of influence. The SLF displays local communities as living in a vulnerable context within which they have access to livelihood assets (human, natural, social, physical and financial capital). The values of these assets are determined by transforming structures and processes (social/institutional/governmental factors) that influence the livelihood

strategies that are sought by people for the sake of achieving livelihood outcomes [40]. However, this study differs from the SLF as it explores the historical dynamics which have shaped the change of livelihoods along with the transformations that occurred after the establishment of the BR [41]. Qualitative research methodologies were used to explore the views and perspectives of different social actors involved in the establishment of the BR and the following changes in land use and livelihoods experienced by the existing rural communities.

The data were collected from different actors (a total of 65 respondents) through personal interviews or focus group discussions, people perceptions, experiences and narratives [42,43]. The Ministry of Environment, the JMBR management unit and the local people were addressed:

- A relevant respondent from the Ministry of Environment was interviewed in order to understand the process of allocation of protected areas in Lebanon and the management systems of such protected areas in general. A semi-standardized interview was conducted to identify the process of the allocation of protected areas in Lebanon and the relationship between the protected areas and rural communities and the integration of rural communities in the declaration process of protected areas.
- A relevant member of the management team of Jabal Moussa was addressed to understand the process of allocating Jabal Moussa Biosphere Reserve, the challenges that were faced during its allocation and the challenges still faced today in addition to the management approach followed in this reserve. A semi-standardized interview was conducted with the respondent in order to understand the perception of the management team towards the efficiency of the protected area, the relationship of the management unit with the local people and how the rural communities help or hinder the conservation process.
- A total of 60 respondents from the local communities were addressed. These respondents included the key informants, farmers, women and youth. The local respondents' selection was area-based. The area was divided into three zones (Figure 2) from where the respondents were targeted: (i) Zone A included 30 respondents residing close to the JMBR (mainly in Yahchouch, Chouan and Amez), (ii) Zone B included 15 respondents residing in the villages surrounding JMBR but distant from the JMBR (mainly in Ghbele and Jouret el Termos) and (iii) Zone C included 15 respondents living within the Keserwan district but far from JMBR (including Ghazir, Bazhel, Okeibe and Kfour). Out of the 60 respondents, 30 were interviewed through semi-standardized personal interviews to collect individual experiences and detailed personal perceptions towards conservation and PAs, and 30 were approached through focus group discussions (FGDs). Three FGDs were held targeting a total of 30 young locals to discuss youth's perceptions of conservation, especially because the young generation plays a significant role in the sustainability of environmental conservation. The focus group discussion method was considered to reveal the general collective perception of the young generation towards protected areas. Interviews and FGDs with the local communities were conducted for the sake of understanding their perceptions towards nature and conservation in general and protected areas in particular, their extent of dependence on natural resources for their livelihoods, the socioeconomic changes that occurred due to the allocation of Jabal Moussa a biosphere reserve, the relationship between the rural people and the management team and the ways in which Jabal Moussa altered space materially and discursively. The aspects that were considered during interviews comprised economic impact, sociocultural impact and political impact.

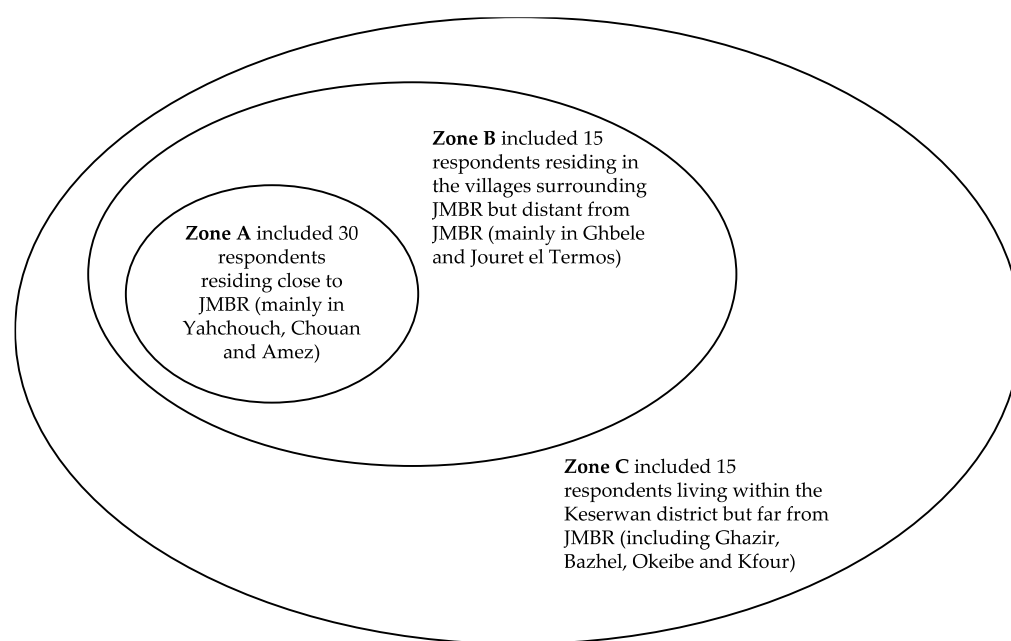


Figure 2. The area-based selection of participants according to the three zones delineated based on the proximity of the villages to JMBR.

In this research, data analysis was sequential starting at the onset of data collection. The data were explored inductively using content analysis and categories, and explanations were generated accordingly. The data were categorized according to (1) the extent of harm or beneficence posed by the protected area on the different aspects of local communities (economic, social, psychological, cultural and political) and (2) the people's perceptions towards nature, conservation and protected areas. The data relevant to each category were identified and examined through the “constant comparison” process; each datum was compared with the rest of the data to form analytical categories. Then, the analysis was taken forward beyond the basic descriptive process towards a more analytic induction; the investigator provided propositions and recommendations.

Quantitative data on demographic and social characteristics were collected and analyzed based on semi-structured interviews with the local respondents. The respondents were asked about their age, gender, marital status, working status and educational background. Direct questions targeting family income were not raised, but the respondents were divided into three categories (Categories I, II and III, with Category III being the wealthiest) based on the predictions made out of other indicators (school or university attended, profession, assets owned, etc.).

2.3. Characteristics of the Respondents

The age range distribution of the respondents participating in the personal interviews showed that 10 of the respondents were in the 18–30 age group, four—in the 31–40 age group, six—in the 41–50 age group, and 10 respondents were above 50. The average age of the respondents was within the range of 31–40 years. The respondents were equally divided between single and married, and 20 of the interviewed respondents were males. Most of the respondents (10 respondents) attended university, followed by eight respondents who were illiterate; six could read and write; five reached the secondary level (Table 1).

Focus group discussions were conducted with 30 young people aged between 18 and 30, of which 14 were males. Almost all the respondents were not married, and most were studying or looking for a job. All the participants were educated; 15 reached the secondary level, and 15 of them attended university.

Table 1. Distribution of the respondents of the personal interviews by age, gender, education status and income.

Age Group	Number of Respondents
18–30	10
31–40	4
41–50	6
Above 50	10
Gender	
Male	20
Female	9
Educational level	
Illiterate	8
Read and write	6
Secondary level	5
University level	10
Income category	
Category I	8
Category II	15
Category III	7

The households' livelihood strategies of all the respondents showed that 14 households out of the 60 relied on the environment in their livelihood strategies (small ruminants, farming, herb collection, camping sites). Only one household relied completely on the environment for its livelihood by raising small ruminants. Most of the respondents in this study were engaged in the services sector (47 respondents). A total of nine households were engaged in agricultural practices, three were engaged in construction, one—in intellectual services. Inquiries on the households' wealth status revealed that 15 respondents belonged to Category I (low wealth status), 30—to Category II (mid-wealth status), 15—to Category III (high wealth status).

3. Results

3.1. Rural Communities' Perceptions towards Conservation

The personal interviews conducted showed that the respondents found difficulties in explaining their perceptions of nature revealing that they seldom discuss or think of their attitude to the environment. They found difficulties in answering questions like “What does nature mean to you/how do you perceive nature?”. The semi-structured interviews made them think of the values they have not thought of before and helped them express their perceptions, feelings and thoughts. By asking facilitatory questions and aiding the respondents express their thoughts, the interviews and FGDs revealed the significance of discussing people's perceptions as it leads to conscious reflection about environmental values and threats. This was reflected in the respondents' feedback pointing out “we never thought of this before/this discussion made me aware of this issue/in fact, after asking me this, you made me think of . . . ”. Engaging the local communities in discussions relevant to nature conservation and local livelihoods was missing in JMBR. “We never discussed conservation-related issues with JMBR. I am sure we lack a lot of information and awareness about this reserve. Discussing such matters would help us better understand the importance of conservation practices and maybe help us see the impact of the reserve from a different perspective.”

Almost all the respondents appreciate nature's values: "nature is essential for the survival of all living things including us, humans", "it is significant on different fronts: beauty and landscape, psychological and physical health and the financial sustainability of many households". Most of the respondents appreciate the recreational services that nature offers citizens: "the most enjoyable activities are done in nature", "if we wish to relieve our anger, stress, sadness, we rely on nature". Around half of the respondents stated that nature is essential for the livelihoods of rural citizens: "especially the poorest, and the ones who reside in the village all year long"; some expressed the significance of nature in securing humans' health through the ecological services it provides: "nature purifies the air, provides us with water and healthy soil".

Three themes emerged describing the positive perceptions the residents have towards conservation: recreation and esthetics, environmental preservation, and economic benefits. Most of the respondents prize the role of JMBR in preserving landscapes and green areas further highlighting the prevailing environmental degradation in Lebanon. "We need such protected areas to preserve what is left from Lebanon's environment; these few green spaces are all what is of value in this country, and conserving them is a must", mentioned the local respondents. A few of the respondents value its role in creating new job opportunities: "I encourage any project that would create new income generating activities for the locals. I am not sure how many locals benefit economically from the BR, but I am aware of few". Five respondents pointed out the significant role of ecotourism in the BR: "JMBR made our village famous among foreigners; I feel proud when I mention that I reside near the reserve since all people know it". On the other hand, four themes emerged describing negative perceptions: negative economic impacts, negative impact imposed on culture, negative impact on the wildlife and limited recreational activities. Some of the respondents highlighted the negative impact the BR has on the cultural aspect of their village through increasing waste and increasing numbers of visitors, hence destructing the authentic "rural values" of their region: "what characterizes a "village" is its calmness and neatness, and these characteristics were lost with the allocation of the BR. Thousands of visitors pass by our village distracting the authentic values of our region and exerting extra pressure on our infrastructure". The respondents noted that the infrastructure in their villages is not accommodated to receive such a large number of tourists. In addition, twenty-five respondents noted that protected areas, through their strict limitations and regulations, limit access to livelihoods and free recreational activities: "I never visited the mountain after its allocation as a BR as I cannot accept the idea of having to pay to enter the mountain with some friends. And I do not understand why camping is not allowed. The impact that is being currently imposed on the environment by the many visitors and hikers is definitely larger than the impact that we, the locals, used to impose when camping prior to the allocation of the reserve", pointed out one young respondent. Some of the respondents pointed out the negative impact wild animals have on rural communities: (i) the locals are encountering wild animals more often, which scares some of the respondents; (ii) some animals destroy agricultural fields, hence further imposing extra challenges on vulnerable farmers. Most of the respondents who claimed the uselessness of conservation or the harm conservation imposes on livelihoods live close to the reserve (25 out of the 28 respondents), while almost all the participants living in Zones B and C believe that conservation is needed. Besides, an association between the respondents' employment and their perception towards conservation was observed. The respondents whose livelihood strategies depend on natural resources (e.g., farming, collection of herbs) and most of whom belong to the older generation had more negative perceptions towards conservation practices.

According to the management team, JMBR does execute environmental awareness activities such as conducting awareness sessions at schools. However, only few participants (3) indicated attending an awareness session by JMBR when they were kids, but they did not recall receiving information on wild animals except the hyraxes—the JMBR's charismatic species. None of the respondents expressed environmental awareness; none

of them recognized the importance of wild species. Many of the respondents referred to wild mammals as “beasts”. When asked about wild species (hyenas in particular), all the respondents considered this wild species as dangerous to humans. The respondents were asked about the hyenas in particular due to the bad reputation this species has and the misconceptions about it [44]. The respondents from villages further away from Jabal Moussa (Zone C) revealed their ignorance about everything related to Jabal Moussa; they had never been targeted in any of the JMBR’s activities. These results reveal the low impact the BR has on awareness raising. The lack of awareness further hinders the locals’ appreciation of the reserve. If the locals understood the importance of biodiversity and wild species, they would accept and value more the practices employed for the conservation of this biodiversity.

3.2. Local Participation

Based on the interview conducted with the member from the JMBR management team, the land where Jabal Moussa is situated is owned by the Maronite (Roman Catholic) Patriarchate and several Church endowments and was used by neighboring villages for forestry, charcoaling and small-scale pastoral and agricultural activity. The land was accessible to all people and was rented by charcoaling practitioners. After realizing that there were efforts to construct a road on the mountain near the famous Roman Road to facilitate charcoal extraction, a group of local nature lovers and their urban friends became worried about the health and the future of the mountain and therefore formed the Not-For-Profit Association for the Protection of Jabal Moussa (APJM) NGO in 2007. APJM aims at conserving the cultural and natural heritage of the mountain. Since most of the land is privately owned by the Church, turning it into a nature reserve was not possible according to the Lebanese legislation that states that nature reserves are allocated on public lands. The only solution was to rent the land. APJM negotiated and funded a 10-year lease contract with Church endowments to rent large areas of the mountain. APJM then turned to various international organizations to convince the Lebanese Government of the importance of the site, becoming a UNESCO Biosphere Reserve in 2009, a Global Important Bird Area (according to the BirdLife International criteria), a member of the IUCN, an Important Plant Area and a Key Biodiversity Area. APJM currently manages the reserve. The team is composed of members from the surrounding villages ensuring inclusion of the local communities in the management of the reserve.

According to the local respondents, the local communities never had a say in the allocation of the BR. They were neither consulted nor included in the allocation process. Besides, they were never engaged in decision-making throughout and after the allocation of the BR. “I guess JMBR sought the opinion of some focal points, such as the head of the municipality, the mayor and the priest in the village; but their opinions are not inclusive enough and do not reflect the views of the locals. The perceptions of locals were never sought”, mentioned a local dweller. The participatory approach on which BRs are based was not implemented throughout the allocation of JMBR.

Besides their feeling of exclusion, the respondents in Zone A considered the management unit of the reserve as outsiders although the team is composed of people from the surrounding villages. All the respondents from Zone A expressed a sense of ownership towards the JMBR’s land. The respondents who used to practice certain activities in the land (12 out of the 60 respondents) expressed a stronger sense of ownership. Although the Roman road and Roman stairs have been famous in the reserve and were investigated by experts, one of the respondents claimed that “My grandparents lived on this mountain and they, among others, built the stairs and the house that the management team calls “Roman” just to gather more visitors hence more money”. The respondents in zone A expressed their disappointment in having an external party involved in the protection of “their own land”: “we have been the main custodians of the mountain for so long. No need to protect the mountain from us”. Three of the respondents highlighted that the environment should be protected from large businesses and companies seeking economic development and

personal growth at the expense of the environment: “local practices have been practiced in rural areas for so long; our practices—such as herding and tree trimming for household use—have become part of the ecological cycle”.

According to the MoE representative, MoE’s regulations related to establishing a PA do not engage rural communities in the allocation, management and sustainability of PAs. According to the MoE representative, rural communities are not involved in any phase of the PA allocation and management except that the management team is composed of the local members. The locals’ participation in the PA allocation and management is very minimal as the local communities do not have control over the decision-making processes or structures. According to some local interviewees, local communities do not even rely on the MoE to object against the PAs’ policies and practices as they are aware of the MoE’s neglect towards their needs and perceptions: “Why bother raising our concerns? It is useless; no one cares about the local vulnerable communities”.

Lebanon lacks specific legislation related to biosphere reserves. The core areas of BRs in Lebanon are allocated by the MoE as natural reserves (e.g., Shouf Biosphere Reserve) or natural sites (e.g., JMBR). The core area of JMBR is composed of a protected forest—by a Decision of the Ministry of Agriculture. In 2012, JMBR was proclaimed a natural site through a Decree issued by the MoE. This nomination allows the MoE to regulate the conditions of quarries and investments within Jabal Moussa. In addition, being rich in historical and cultural sites, Jabal Moussa was given some local protection status by the Ministry of Culture (e.g., Roman Stairs). APJM endorses the same regulations as for nature reserves (e.g., no hunting, limited grazing activities, limited activities held in the core and buffer zones). Biosphere reserves are designated by the International Coordinating Council of the Man and Biosphere (MAB) program which is responsible for the following tasks: guiding, supervising and reviewing the progress made by the MAB program, recommending research projects to countries and making proposals on the organization of regional or international cooperation, assessing priorities among projects and MAB activities, coordinating the international cooperation of the member states participating in the MAB program, deciding on new designations of BRs, giving feedback and recommendations on progress reports, etc. [3,45]. The functioning mechanism of the MAB program gives the managing authorities of the participating countries full responsibility for translating its BR objectives. While this flexibility ensures customization of BR management to the local needs and contexts, implementation of social and livelihood perspectives at the local level suffers from serious deficits. This has been reflected in JMBR through, namely, weak communication, minimal development and minimal engagement of the local communities.

3.3. Impact of the BR on Livelihoods

In light of environmental degradation in Lebanon, one cannot disregard the need for conservation actions. The high activity of quarries in Amez reveals the importance of JMBR in conserving the region’s landscape and heritage; APJM gives special importance to cultural monuments in the reserve. Furthermore, according to the JMBR representative, JMBR has been supporting livelihood strategies of the locals by providing several work opportunities including five full-time staff (ecotourism and conservation), six full-time guards and 20 guides (on-demand casual jobs), five guest houses and 20–30 ladies working seasonally in the JMBR kitchen and artisan shops. In addition, the local people are engaged in different activities held in the reserve whenever applicable (e.g., opening of trails, planting, research, etc.). According to the JMBR management unit, engagement of the locals in the BR’s activities is essential to develop the locals’ sense of ownership and improve their knowledge and skills.

On the other hand, the benefits indicated by APJM were not appreciated by this study’s respondents who felt that the positive economic impact was very minimal, benefiting only very few locals. Although conservation organizations try to engage participants in developmental activities, access to benefits from conservation remains typically in the hands of the organization’s authority. It is subject to rules of eligibility and compliance

with a range of regulations. In such arrangements, there is ample room for capture of revenues by the elite. This was expressed by one of the respondents who explained that “We cannot even benefit from tourists since usually the visits of big groups are managed by the management team”. According to 17 out of the 30 individual respondents, benefits are not distributed equally among the stakeholders, and the management unit is the main beneficiary in this process.

According to the local respondents, in addition to having full control over any economic benefit that might result from the BR, APJM restricts traditional activities in the area. Displacement features prominently among the impacts of PAs on rural communities worldwide. In this study, shepherds, charcoal extractors and hunters were among the groups displaced by JMBR (bearing in mind that “displacement” includes the restriction of access to resources even without direct physical removal). According to the respondents, agriculture and charcoaling were highly practiced during the 1990s in Jabal Moussa, but these practices have been on the decline due to the challenges facing such livelihood strategies, including vulnerability to climate change, lack of social security, lack of supportive policies and lack of interest for upcoming generations. Almost all the respondents pointed out that JMBR did not have any direct negative impact on the decline of these livelihood strategies; however, its management regulations exert extra pressure, especially on pastoralism. Surprisingly, a significant share of youth (26 out of the 30 young respondents participating in the FGD) appreciated pastoralism, although none would think of adopting this livelihood strategy. A total of 28 out of the 60 respondents mentioned the direct negative impact of PAs on herders.

According to an interviewed family practicing herding, although other grazing lands might exist elsewhere, JMBR has made their livelihoods more challenging. Imposing challenges on agricultural practices reduces the PA’s potential role in fostering poverty reduction and food security. After several conflicts with the shepherds, the JMBR management unit allocated a specific path for the movement and grazing of herds; however, the shepherds did not comply with these rules, and one of them kept on moving throughout the reserve, resulting in fines issued by the MoE. According to the shepherd’s family members, “the specified path is not enough to feed our flock; it is very restricted. So, we take our ruminants there only as a favor for JMBR; it does not do us any good”. The dissatisfaction of such stakeholders towards the reserve’s rules reflects the lack of discussion between the land users and the JMBR management unit and policy makers.

In addition, the farmers living in Zone A had other plans for the mountain, specifically those living in Amez, one of the most marginalized villages surrounding JMBR, where the local inhabitants mainly work in agriculture. The village also has a few herders and charcoal producers; however, herding and charcoal extraction have been on the decline in this village since they cannot sustain a wealthy livelihood, especially with the competing international market. A road was supposed to be established connecting Amez directly with the Mchati village, further facilitating transportation to adjacent villages. However, this road was blocked upon the allocation of the BR as the road passes through the BR’s area. The villagers saw potential opportunities to develop their region in this road since it would have offered them various services, facilitating transportation for farmers to deliver their crops and being accessible during the winter season, hence offering the locals the possibility to stay in their home village during the winter. “Why were our plans hindered in favor of theirs (*APJM’s plans*)? As a local living in this village for so long, I believe our needs should be prioritized”, mentioned a respondent residing in Amez. These results reflect the main concerns of conservation: whose needs should be prioritized; who should set the objectives for conservation policies and how should trade-offs between the different objectives and priorities of diverse stakeholders be negotiated?

4. Discussion

4.1. Rural Communities' Perceptions towards Conservation

The challenges faced by the respondents in communicating their relationship with nature reflects the low engagement of the locals in such discussions. Usually, the connection or relationship people have with nature is unconscious or implicit, and the use of techniques such as perspective-taking could be useful in bringing people's awareness of their connection to nature to a more conscious level [46]. Although such discussions might not result in changing the perception of individuals on their relationship with nature, making people more aware of their views would lead to conscious reflection about the issue. The local communities are not engaged in discussions relevant to nature conservation and local livelihoods by JMBR. BRs should offer an open space for communication, opening up forums for the exchange of ideas and perceptions to ensure that silent voices are heard and taken into account. Such practices are highly significant as they tend to enhance social cohesion between different stakeholders, clarify the locals' perceptions and result in better strategies complying with the needs of different stakeholders.

In this study, the interviewees' feedback on the importance of nature was more oriented towards egoistic (concerns for self—my health, my future, my lifestyle) and altruistic concerns (concerns for other people—people in my community, all people, children, my children) mainly appreciating the recreational value of nature and its economic value. However, the interviewees did not reflect biospheric concerns (concerns for the biosphere—plants, animals, marine life, birds) towards the environment. The interviewees' strong egoistic and altruistic concerns might be explained by people's increased level of separation between themselves and nature. Reducing the level of separation between people and the environment is important to increase people's biospheric concerns [47]. Instead of increasing people's biospheric concerns, it is argued that conservation increases the separation between rural communities and their environment. BRs follow "modern constructions", further separating communities from the environment by dividing areas into the core, buffer and development zones. As the human population increases, uninhabited wild zones decrease and PAs' "core zones" are not sufficient to protect the existing wildlife. The solution is in discovering a common middle ground in which all things from the city to the wilderness can be encompassed in the word "home" [48], hence removing any boundaries between human civilization, technological advancement and nature. The people living in Zone A in this study leaned towards the concept of "home" highlighted by Cronon (1996). Their personal experience and their close relationship to nature was clear in some of their expressions: "saving nature should not be through a project or an activity; it should rather be a lifestyle"; "nature should not be protected from us; we do not harm nature, and our activities held on the mountain have been practiced for so long that they are part of the natural ecosystem now"; "they—*conservation practitioners*—harm the ecosystem if they do not let us—*shepherds*—practice grazing that has been a cultural practice held by our grandparents and should be conserved for the next generations". BRs could play an important role as experimental sites for the local and surrounding communities where the upcoming generations have weak engagement in agricultural activities and a low level of connectedness to nature. They can be perfect candidates for the representation of this "home" in which rural livelihoods and nature conservation are regarded as a single entity and are never separated by boundaries; it is only then that communities would develop their biospheric concerns and hence respect the "boundaries" that the wildlife needs.

The locals' perceptions towards conservation were diverse. An association between the respondents' proximity to the reserve and their perception towards conservation was reflected in this study. Most of the respondents who claimed the uselessness of conservation or the harm conservation imposes on livelihoods live close to the reserve. This reflects the fact that personal experiences of people living close to the reserve might be behind their negative perceptions towards conservation. In addition, as the respondents having livelihood strategies dependent on natural resources had more negative perceptions towards conservation practices, the results of this study reflect how those who depend on

ecosystem services are the most affected by conservation practices. This conforms with insights made by Kumar and Yashiro (2014) arguing that by being among the poorest and most powerless in their communities, those who depend on ecosystem services tend to benefit less from nature conservation activities than those who are less poor [49].

The locals' different perceptions highlight the inefficiency of one-size-fits-all regulations in conservation. In order to reduce the negative impact of conservation while increasing its benefits, detailed information about the relevant communities is required. Understanding the different perceptions of local communities is highly recommended before the allocation of a more efficient inclusive PA or BR and throughout the conservation action [50]. This has been lacking in JMBR where communication with local communities has been very weak throughout the allocation process and the conservation strategy. Similarly, the importance of communicating with and engaging locals was revealed in a BR in Egypt where there is still insufficient appreciation of the differences between BRs and the conventional protected areas [51]. Holding such discussions would increase the trust between the conservation practitioners and the local communities and help the BR's managers ensure a more inclusive management plan.

The lack of awareness about the importance of wild species among the locals makes it harder for them to appreciate the JMBR's conservation efforts. Similar to these results, the study on the socioeconomic investigation of the region surrounding Jabal Moussa conducted in 2009 revealed the low environmental awareness of the locals [52]. Therefore, JMBR does not have any positive impact on the environmental awareness of the local communities. This threatens the sustainability of conservation beyond the biosphere reserve boundaries and existence.

4.2. Conservation Practices: Bias against Rural Inclusion

The contradictory perceptions revealed by the management unit and the locals regarding the locals' inclusion in the BR reflects the different expectations each of these stakeholders have regarding participation. During the allocation and management of JMBR, one can infer that "passive participation" [53] was implemented without influencing the decision-making process and the predetermined agenda.

In addition, regarding the members of the management unit as outsiders—as described by the locals—prevents the locals from seeing any positive potential of the BR and valuing the efforts of the management unit even if the reserve has not affected these locals negatively. The findings showed the outsiders failed to incorporate people's views in the conception of the BR and, as a consequence, they were unable to improve the well-being of the vulnerable rural communities. In this respect, six biases—spatial, project, person, dry season, diplomatic and professional biases—were identified by Chambers (1983) [54]. These biases prevent development practitioners from reaching out and understanding the poorer people. Of these biases, "person" and "professional" could be considered applicable in the case of BR allocation preventing the reserve from reaching poor people whereas the elite, most influential and most active individuals end up being recognized by PA management units. "Professional bias" is also applicable in this context as specialization prevents the development practitioners from understanding and accepting the perspectives and the views of the poor within communities. Professionals end up focusing on the technicalities of conservation and environmental protection. "Professionals in rural areas become even more narrowly single-minded. They do their own thing and only their own thing. They look for and find what fits their ideas" [54] (p. 23).

The sense of ownership revealed by the Zone A respondents renders "participation" and "inclusion" of the local communities in the PA harder, especially when inclusion is planned and managed by people regarded as "outsiders". The strong sense of land ownership revealed by the local communities could be used by PA founders as a successful tool to protect the land while simultaneously triggering local social movements instead of employing top-down approaches in development schemes. The role of social movements, grassroots organizations and local communities can mold a bottom-up approach to bio-

diversity conservation through the cultural politics they enact [55]. In this perspective, Escobar (1998) [55] argued that particular challenges within biodiversity debates (such as territorial control, alternative development, intellectual property rights, genetic resources, local knowledge and conservation itself) take on new forms as they are not limited to the managerial and economizing instructions offered by dominant powerful actors. In Latin America, in countries such as Peru, Ecuador, Colombia, Bolivia and Brazil, significant experiences have taken place in this regard [55].

The results of this study raise questions about the international policies of BR allocation. Biosphere reserves are nominated by national agencies and are then internationally recognized by the Man and Biosphere Reserve (MAB) Program, which is an intergovernmental scientific program established by UNESCO for the aim of improving the relationship between people and their environments. The prerequisite of these reserves is to have three interconnected functions: conservation, development and logistical support. The “development” function states: “Development to foster sustainable economic and human development” [56]. However, what constitutes sustainability and development and how to achieve them has not been fully elaborated. Therefore, such reserves end up being contradictory as local people’s concerns, needs and priorities are not required for the allocation of a BR, although the improvement of socioeconomic conditions of local people is among the BR functions. The MAB Strategy (2015–2025) [57] highlights local participation and empowerment through different pillars including (i) the BRs recognizing the role of traditional and local knowledge in ecosystem management and focusing on a multi-stakeholder approach that emphasizes the involvement of local communities in management; (ii) the participatory planning for sustainable development in BRs taking into account the rights, needs and abilities of youth, women and local communities and their ownership and use of natural resources; (iii) the BRs acting as models to explore, demonstrate and establish innovative approaches that promote the opportunities for youth and the resilience of local communities through livelihood diversification, social enterprises and green businesses; (iv) traditional knowledge being considered as a “knowledge input” for the management of BRs while acknowledging the significance of maintaining cultural identity and empowering the local communities as guardians of this unique knowledge. Local participation, local knowledge and the rights and needs of indigenous peoples are well-acknowledged within the abovementioned strategy. However, the locals’ say in establishing BRs, their role in identifying their rights, needs and priorities and indicating conservation priorities is not stressed. According to the critics of the participatory approach, participatory techniques might simplify lives of people in order to fit them into diagrams, charts and tables, as well as the rules and boundaries of methodological tools [58]. Cooke and Kothari (2001) [59] argue that even local knowledge might be shaped by what the agency was expected to deliver instead of identifying planning processes and outcomes. Nomination, design and planning of BRs should start with including those affected in decision-making. The abovementioned recommendations keep the decision-making power in the hands of BR managers and do not restructure power relations, which might result in only passive participation and deceiving results to local communities as revealed in this case study.

4.3. Implications of Conservation Practices on Livelihoods: Land Use Shifts and the Socioeconomic Impact

The conducted interviews and focus groups discussions reveal the different perceptions and needs of the local respondents. Within such heterogeneous communities, finding a middle ground that would satisfy all the stakeholders, sustain natural resources and support local development becomes more challenging and requires extensive communication and interdisciplinary inclusive plans. One-size-fits-all policies do not provide adequate solutions for degradation and poverty challenges. In such contexts, the diversity of the locals’ perceptions, needs and livelihoods should act as a starting point for sustainable development, poverty alleviation and resource management.

With the local respondents expressing that benefits are not distributed equally among the stakeholders and the management unit is the main beneficiary in this process, these re-

sults are in line with the school of thought that argues that power relations and inequalities are at the core of the failure of rural development and the “participatory approach” tends to exacerbate power relations and inequalities, hence empowering the key actors over the local communities [54,58,60–62].

Of the greatest impacts of PAs on rural communities worldwide is displacement. In this study, shepherds, charcoal extractors and hunters were among the groups displaced by JMBR (bearing in mind that “displacement” includes the restriction of access to resources even without direct physical removal). As the results of this study highlight the negative impact PAs might have on herders, looking into conserving small ruminant-based livelihoods becomes a necessity within conservation practices given the importance of such a livelihood strategy. Sustainable pastoralism has a positive impact on soil fertility, soil formation and soil carbon, water regulation, pest and disease regulation, water cycling, biodiversity conservation and fire management [63]. In addition, it contributes to economic growth and resilient livelihoods in the regions that are exposed to unpredictable climate and natural hazards. In Lebanon, the production of small ruminants is threatened with extinction due to serious challenges related to the know-how, marketing, labor fees, feeding costs and grazing potential [64]. Therefore, special attention should be focused on these threatened communities which have been further marginalized by conservation practices and PA allocation. PAs have a significant potential in promoting food security through mitigating and adapting to climate change, protecting heterogeneous habitats and species and conserving wild crop species instead of hindering agricultural practices. The interdependence of biodiversity and agriculture and the important role they play in the maintenance of each other make PAs potential agents for enhanced food security [65,66]. Therefore, PAs should be managed in a way to promote agroecology and traditional agricultural practices offering rural communities healthy food and additional income, hence promoting their livelihoods and enhancing food security. In this respect, Jeary, Kandel, Martiniello and Twongyirwe (2018) argue that conservation and agriculture should be considered jointly to be able to minimize the trade-offs between the two [67]. The land-sharing framework, for example, considers both conservation and food production as integrated in a way mimicking natural habitats by reducing synthetic inputs and preserving wild areas as reservoirs for biodiversity, hence minimizing the trade-offs between conservation and agricultural livelihoods while enhancing food security and conserving the environment.

The alternative plans that were held by the Zone A respondents show the different priorities that the locals and the management unit have. These results are in compliance with those of Adams and Hutton (2007) who highlighted that indigenous peoples who wish to preserve their right to land and conservationists who wish to conserve wild habitats for biodiversity might not share a common interest [68]. Indigenous peoples are not supposed to live up to the “novel savagery” and “ecological nobility” expectations of the Westerners [69]. Therefore, instead of inhibiting rural communities’ livelihoods, BRs could be the main instrument for rural development while securing nature protection. However, the complexity of rural communities renders meeting developmental and conservation needs very challenging. Given the importance of both indigenous knowledge and science, Redford (1991) argues that a “mosaic of methods” should be adopted in which we learn from indigenous peoples and twist their methods through selection, refinement and innovation [69]. By adopting the mosaic of methods, BR management could promote sustainable indigenous land use methods and back them up with innovation to ensure the sustainability of natural resources without hindering the development of rural communities.

The heterogeneity of perceptions revealed in this study reflects the challenging nature of participation and the importance of engaging all the relevant stakeholders in the planning, development and management of a biosphere reserve. Figure 3 summarizes the main practices and approaches highlighted in the above discussion for a better establishment and management of a biosphere reserve addressing the challenges revealed in this study.

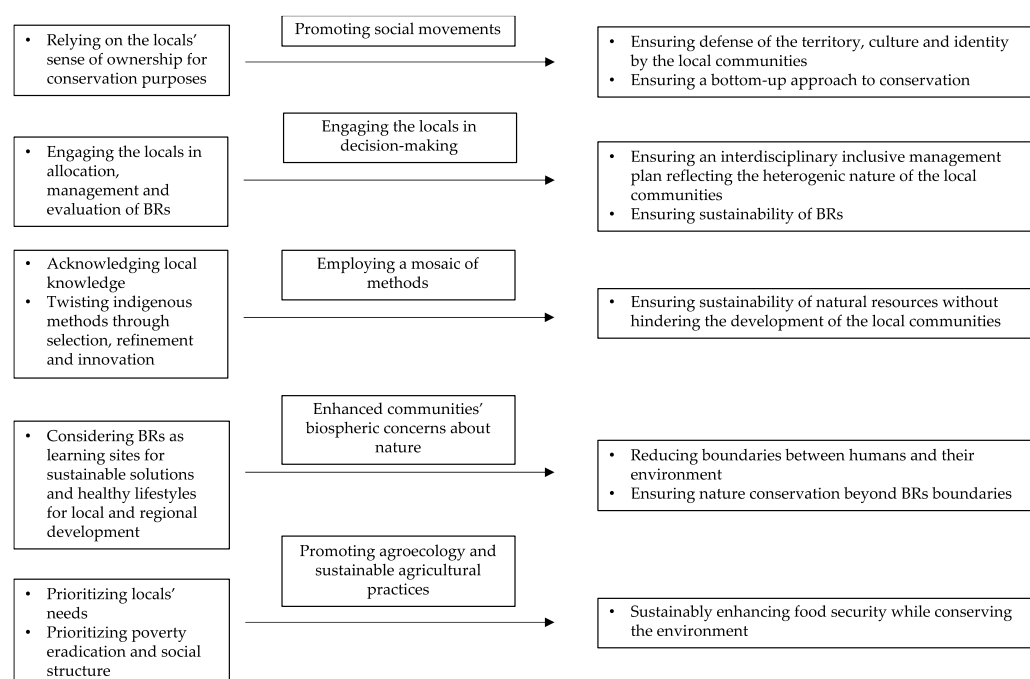


Figure 3. Best practices and approaches to an inclusive establishment and management of a BR maintaining community development while conserving nature.

5. Conclusions

Although biosphere reserves discursively champion participatory, sustainable and community-based approaches, their allocation, management and practices have not always reflected these developmental approaches. This case study highlights these rifts between discourse and practice through insights from fieldwork conducted in a biosphere reserve that reveals the lack of the locals' engagement in the allocation and management. Although Jabal Moussa Biosphere Reserve creates employment opportunities and results in the conservation of the targeted mountain's landscape, the local respondents did not acknowledge the BR's services and did not appreciate the participatory approach of the reserve. According to the locals, the reserve displaces land users, such as pastoralists, whose livelihoods are already facing considerable environmental and socioeconomic challenges. Furthermore, the fact that local communities had had development plans that were halted by the allocation of the biosphere reserve reveals the different priorities and needs of the local communities that might be contradictory to those of conservation agencies.

To foster rural development while conserving the environment, this study stresses the importance of the locals' engagement in the whole conservation process and the transparent communication between the BR management unit and the local communities to reduce the gap between the aims and priorities of the BR management units and the locals. By putting people, their needs, perceptions and priorities at the center of decision-making, conservation agencies would shift the main objective of BRs from conservation to poverty reduction. Developing strategies in partnership with local communities to include the most vulnerable groups, experts and relevant private and public stakeholders and prioritize the local communities and consider conservation as a tool for poverty reduction would increase the efficiency of BRs in fostering local livelihoods and minimizing the trade-offs between conservation and development.

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