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CONSERVATION-DEVELOPMENT DUALITY: THE BIOSPHERE RESERVE SIERRA DE GRAZALEMA AFTER 40 YEARS IN THE MAB PROGRAMME

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Abstract

Since 1971 the programme Man and the Biosphere (MaB) of UNESCO has been dedicated to promoting Protected Areas in which conservation of nature is closely linked to territorial development that is beneficial to local communities. In Spain the first area declared as a Biosphere Reserve was Sierra de Grazalema (1977). The history of the management of this Protected Area is now significant enough to analyze how the applied initiatives aimed at conservation have harmonized with those most directly committed to social and economic development. This paper provides an extensive review of the conservation and development programmes and associated measures implemented in the last ten years in Sierra de Grazalema.

Keywords: *Biosphere reserve, conservation, development, protected areas, Grazalema.*

1. INTRODUCTION

During the last several decades, the role of Protected Areas (PA) has been significantly redefined in relation to the debate on sustainability. These changes have been accompanied by major updates in European and worldwide policies on PA (Antón et al. 2008). Mose and Weixlbaumer (2006) and Gamper (2007) published papers on a genuine paradigm shift from static protection to dynamic and integrated approaches. Initially, PA were seen as genuine nature sanctuaries whose functions were limited to the protection of the environment and to the preservation of natural settings for mainly urban societies. These functions were understood as essentially being opposed to the goals of economic development. After the Rio Conference, PA tried to overcome the dichotomy between protection and resource use by applying dynamic and innovative forms of management.

PA increased since the 1970s and have become a valuable tool for the development of local communities, both within and outside their borders. In this context, Biosphere Reserves (BRs) can be considered as a key category in the implementation of new functions attributed

to PA. Since its beginning, the Man and the Biosphere (MaB) Programme was developed as a tool for reconciliation of conservation efforts related to development (Batisse 1982).

Despite these advances that have taken place in this area since the 1990s, the need to overcome the conservation-development duality and to integrate PA into a regional context remains a challenge (Gómez 2016).

In this paper, we are analyzing the role of developmental policies in management of these areas. A discussion as to whether there is a real agreement between the prevailing philosophy of dynamic and integrated management of PA and the reality of the programmes and activities that have been implemented in recent years will be presented. This analysis is based on a case study of the BR Sierra de Grazalema (BRSG).

The objectives of this paper are to:

- Reflect on the roles of PA and on the growing awareness regarding the need to harmonize the management of development and conservation.
- Analyze the UNESCO approach regarding the suitability of incorporating measures of socioeconomic development in BR management
- Review BRSG data.
- Compare the specific role of developmental measures against conservation over the period of the last Decennial Report.
- Analyze basic data as a source of indicators of socioeconomic transformation of the municipalities of the BRSG during the mentioned period.

2. METHODOLOGY

To achieve the above objectives, a bibliographic analysis was conducted, which enabled us to pinpoint the key moments that have marked the birth of the current paradigm of PA and of their specific functions to date. We have also consulted and analyzed the main reference documents of the MaBs Programme.

In the second phase, a thorough review of the official documents containing the results of the management programme carried out in the BRSG during the period under review was completed. Annual reports elaborated by the Natural Park Sierra de Grazalema and the Decennial Report (2003–2013) were also analysed. Various meetings with the managers responsible for the BR, as well as the informal interviews with the various individuals involved with the territory during the elaboration of the Decennial Report have been conducted.

All actions included in the analyzed reports have been classified by fields with the aim of conducting a management assessment, taking the budget of executed projects of each type, the number of projects in each area of activity, and the support given to actions that directly or indirectly affect the productive fabric into account. The analyzed programmes and actions have been classified into either *conservation* or *development*, taking into consideration the main objectives and the following criteria:

1. Budget allocation for each programme where such information is available. Actions have been differentiated between actions with a *direct* impact on the state of ecosystems and improvement of the economic fabric and those which have an *indirect* influence in those fields.
2. The presence of actions during the considered period can be used to quantify the total number of existing programmes in the categories of conservation and development. In this case we have also differentiated between programmes with direct and indirect impact.

Lastly, we have conducted a statistical analysis of socioeconomic parameters in order to understand the effects of the different activities that support the local economy. To fulfil this aim, we have selected a socioeconomic area that was influenced by the BRSG and consists of 14 municipalities (nine and five in the provinces of Cadiz and Malaga, respectively).

The analyzed information comes from various statistical sources which provided data at the municipal level; these sources include the National Institute of Statistics of Spain (INE), the Multiterritorial Information System of Andalusia (SIMA), and the Institute of Statistics and Cartography of Andalusia (IECA).

3. PROTECTED AREAS: BETWEEN CONSERVATION AND DEVELOPMENT

3.1 The functions of Protected Areas and their evolution

Both the PA concept and functions have been evolving over time and adapting to the growing importance of socioeconomic objectives in opposition of other goals that had been considered more typical for these type of spaces: 1) protection; 2) conservation of the natural and cultural environments; 3) scientific research; and 4) recreation and environmental education (Tolón y Lastra 2008).

According to the protectionist view, conservation and development are virtually incompatible. However over time, the need to incorporate the development of local communities has become one of the key issues of PA management. This new view is focused on strengthening the role that PA plays in the regional economy and ultimately ensuring the success of conservation policies.

Initially, in the stage which began with the declaration of the first National Parks, starting with Yellowstone in 1872. The purpose of the PA was primarily to preserve unspoiled nature from the increasingly industrialized world. The aesthetic and recreational functions were also referred to as typical of the first PA (Tolón y Lastra 2008; Mínguez 2012). Until the mid-1970s, PA were viewed as natural sanctuaries subject to static protection, an objective which proved to be incompatible with the interests of development.

Since then, there has been a significant increase in the amount of land declared as PA, particularly in rural areas with low levels of development and whose structural problems limit their options for future progress. Populations living in these spaces have often rejected the appropriation of resources which are required to create Parks, as well as the limitations that conservation objectives impose on economic activities (Garayo 2001; Hynek and Trávnicek 2010; Jiménez et al 2010). Forced by the opposition from local communities, the socioeconomic goals began to be recognized by the public authorities as one of the three functions of PA, along with the guardianship of nature conservation and public use. Despite these efforts, the socio-territorial reality received little attention until the 1990s.

The start of that decade marked the turning point of a predominantly protectionist philosophy characterized by restrictions and increased understanding of the PA as islands of nature. This decade is when the idea of a more open conservation which facilitates the necessary integration of PA in a regional context began to take shape.

The Rio Conference (1992), the Fourth World Congress on National Parks and PA (Caracas, 1992) connected the environment with the problems of humanity and PA with the need for sustainable development of territories. A new context in which active conservation coexists with new forms of mobilization of resources and pursues the development of local communities was initiated.

The International Union for Conservation of Nature's (IUCN) classification of PA in 1994, introduced the category "management VI", which corresponds to the "sustainable use

of natural resources" (IUCN 2003:3) when conservation and sustainable use can be mutually beneficial. Promotion of social and economic benefits to local communities and contributions to sustainable development at the national, regional, and local levels were also included (Dudley 2008).

In Spain, the Law 4/1989 concerning the Conservation of PA and Wild Flora and Fauna (and later Law 42/07), introduced the territory of socioeconomic influence "in order to contribute to maintenance of PA and promote socioeconomic development of local populations in a manner which is consistent with the conservation objectives of the Area".

Moreover, in some regions, such as Andalusia, the socioeconomic plans and programmes (e.g., Sustainable Development Plans), were developed within the legal framework established in 1989.

The Durban agreement, adopted during the Fifth IUCN World Parks Congress in 2003, recognized the progress made in the conservation and social justice agenda and called for the need to "forge synergies between conservation, systems that sustain life and promoting sustainable development" (IUCN 2003:3).

In general, the most advanced policies on nature conservation evolved from physical planning-based PA management. The goals of these policies were to search for new tools for a more integrated environmental and territorial management. In this way, PA could be transformed into areas for innovative management of sustainable development (Troitiño 1995; Hammer et al. 2016). This approach has become vital to the PA, at least in Europe, where the presence of humans and resource management are key factors in shaping the ecosystems and landscapes (Porcel et al. 2015; Voth 2016).

The territories subject to nature protection policies became multifunctional spaces which fulfil different tasks simultaneously (Simancas 2007; Troitiño 1995). Mose and Weixlbaumer (2006:5) indicated that the main objectives and functions of the PA are as follows: “1) preservation and advancement of biodiversity (regulatory function); 2) regional and supra-regional welfare-effects (habitat function); 3) gene pool as well as a natural disaster-prevention (support function); 4) sustainable regional development (development function); and 5) environmental education and training (information function)”. The diversity of functions that are presently attributed to PA involves significant management challenges and opens a new scenario for potential conflicts.

Beyond the more or less accepted multi-functional character of PA and their role in promoting the development of rural areas, PA development management has shown very limited results so far despite the creation of specific tools for planning (Gómez 2016; Troitiño 1995, 2005; Mose and Weixlbaumer 2007).

Within the overall framework of conservation policies and PA, it is worth analyzing such international initiatives such as the UNESCO MaB Programme due to its special commitment to reconciliation of the conservation-development duality within the framework of spaces recognized at the international level as the Biosphere Reserves.

3.2 Contributions of the MaB Programme: the Biosphere Reserves

UNESCO, through the MaB programme initiated in the early 1970s, appears as a pioneering agency in the understanding of sustainable use linked to the conservation of biodiversity. This Programme promotes interdisciplinary research in natural and social sciences and pursues a greater commitment of science to the development of policies for the rational use of resources.

In order to fulfil these objectives, the concept of a BR was created in 1974 which included territories characterized by important natural values, cultural heritage, and populations which

expresses their will to implement a model of development respectful of those values (Batisse 1982; Cianga and Popescu 2013; Sobral et al. 2011).

Biosphere Reserves were assigned three functions: 1) conservation; 2) development; and 3) logistical support (UNESCO 1996). Conservation of biodiversity and natural and cultural resources is one of the primary functions. The other is the promotion of the development of local populations. The MaB Programme considers that both components are equally important and necessary and that the unification of both goals in one, common project is the most specific characteristic of these Reserves. In fact, BR are considered to be experimental areas for finding models of integration of these two functions, which has been referred to as sustainable development after The Rio Conference (Villa 2010).

Although this position was established from the very beginning, in 1983, during the Congress of Minsk, the developmental component has been explicitly recognized as necessary in the Reserves. Gradually, the main scientific objective of the project started to give way to sustainable development. An important milestone in the progress of ideas was the *Strategy of Seville* (1995), in which the accumulated experience was evaluated and the ten basic guidelines for management of BR were established (Hammer et al. 2012). The ideas of trying out different methods of sustainable development on a regional scale and of paying greater attention to the transition zones were strengthened by these guidelines. A zone is defined by the Strategy as a space where sustainable economic activities are promoted to foster socioeconomic development of local populations. Since the 1990s the existence of population inside the zone is a mandatory requirement for the declaration of a new BR (Sobral et al, 2011).

Recently a new strategy for BR for the period of 2015–2025 has been approved and the Action Plan was launched during the 2016 Lima Conference. The Action Plan is based on continuity with the Strategy of Seville in regard to the search for effective sustainable development models. The Plan appears to be closely linked to concerns such as mitigation and adaptation to climate change, conservation and restoration of socio-ecological systems, promotion of effective governance structures, and fostering green and social economy (UNESCO 2016).

The objectives of the BR are complex and must be achieved within the framework of the concepts of global, social, economic, and environmental sustainability. This framework includes conservation of ecosystems resources, land use, and integration of settlements. These PA should function as instruments of regional development involving local people through bottom-up processes and promote economic and social development in their sphere of influence (Frys and Nienaber 2011).

In Spain, a major commitment to the MaB program has been observed through the declaration of 47 BR between 1977 and 2015. Among the first ten BR, five are located in Andalusia. The 2nd and the 3rd Biosphere Reserves World Congresses were held in Spain. The results of the Congresses were implemented in the 1995 Strategy of Seville, 1995 Statutory Framework of the World Network of Biosphere Reserves, and in the 2008 Action Plan of Madrid (UNESCO 2008). UNESCO has had a direct influence on the configuration of the Andalusian PA through the nine existing BR (Cantos 2010; Gómez 2010).

In Andalusia, Law 2/1989, through which the inventory of PA of Andalusia has been approved, recognizes PA as places where social conditions of local populations will be improved. Andalusian BR are considered Natural Parks in part or in their totality. They have a double commitment to fostering development (Villa 2010). Andalusian BR also have Sustainable Development Plans, which focus on "socioeconomic invigoration pursuing the activation of social and business fabric of the territory and aim to ensure that the emerging projects and new entrepreneurs receive the necessary support from the existing aid systems" (CMAOT 2016).

4. CHARACTERIZATION OF STUDY AREA: SIERRA DE GRAZALEMA

The Biosphere Reserve Sierra de Grazalema is located in the westernmost part of the Serrania de Ronda (belonging to the Betic Mountain Range), in the southwest of Spain (Figure 1). This area covers 53411 ha and is a mountain massif with an average altitude of 1100 m (highest point: Sierra del Pinar, 1654 m). The climate is peculiar due to the high rainfall which can reach up to 2000 mm in one year (Becerra 2002). The steep topography and almost vertical rocky escarps is a result of the limestone morphology. Interior corridors between the mountains are a result of depressions in the topography (RERB 2016). Due to this karstic phenomena, there are numerous caves and underground waterways, such as the Hundidero-Gato underground complex (7818 m in length) which has been declared a Natural Monument of Andalusia in 2012 (Decree 383/2011).

The first BR declared in Spain during 1977 was the Sierra de Grazalema. Since 2006 this area is part of the first Transboundary BR of UNESCO also known as the Intercontinental Mediterranean BR Andalusia (Spain) – Morocco (Cantos et al 2010).

The ecological importance of this area is based on the existence of the forests of endemic pinsapo (*Abies Pinsapo*) and a high floristic diversity. A rich historical-artistic and ethnographic heritage (e.g., cultural assets, archaeological sites, rock art) also adds to its formation as a BR. This BR has 14 municipalities, nine of which belong to the province of Cadiz and five to Malaga. The total population of this area is 80,119 inhabitants (INE 2016).

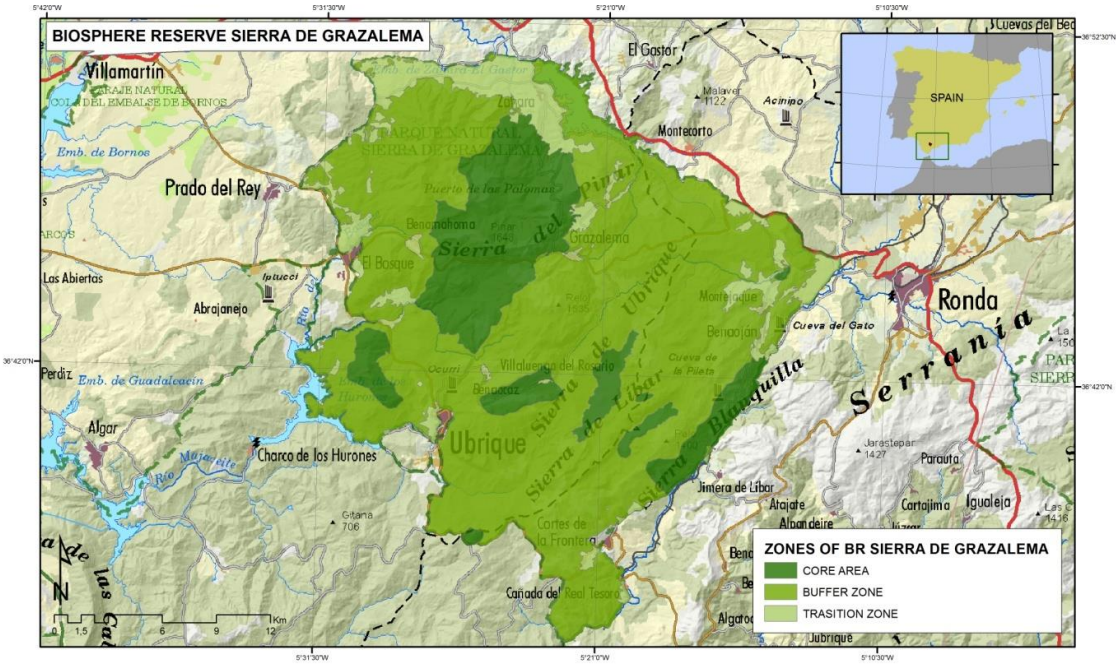


Figure 1. Study Area: Sierra de Grazalema (Adapted from DERA Andalucía data; UNSIMA 2016).

This area is predominantly rural with a tourism sector that has recently been consolidated as an economic force. In 2012, the BRSG was one of the most visited PA in Andalusia (VVAA 2013).

Agriculture and stockbreeding are traditional activities in the area and survive today as a result of more extensive and less labour-demanding production, the rise of eco-production, and selection of autochthonous livestock breeds (Jiménez et al. 2014).

5. RESULTS

5.1 Analysis and classification of the implemented programmes

The analysis conducted for the period of the last Decennial Report (2003-2013) reveals a number of diverse programmes and actions which could be included both in the conservation or development fields.

5.1.1. Programmes characterized by availability of budget data

The available information does not allow an assessment of all actions according to their budget therefore only the available data were analysed. The comparison between the volume of investments in conservation and in socioeconomic development shows a great imbalance between both types. A total of € 22 871 222 was invested during the analyzed period with 82.3% of the total allocated to conservation programmes. Only 16.1% of this amount was invested in development (Table 1).

Table 1. Budget of programmes of Conservation and Development in the period 2003-2013 in the BRSG.

PROGRAMMES	Budget (€)	%
For Conservation	18 827 708	82.32
For Development	3 682 061	16.1
Other	361 453	1.58
TOTAL	22 871 222	100

The high proportion of the budget allocated for conservation work is related mainly to forest management measures. The total expenditure for this end was € 11 430 368 and it refers to programmes for preventive and silvicultural treatments, recovery of pinsapo (*Abies pinsapo*), improving public forests with particular emphasis on the masses of cork oak, other reforestation, and monitoring done by the Network of Damages of Forests. This amount represents almost 50% of total investments. If the economic allocations for fire prevention were added together (almost another four million) we find that the amount available for other conservation programmes represents 32.6% of the Decennial budget.

Among conservation measures related to this percentage (32.6%), we can distinguish programmes characterized by a high budget. The "demarcations" action (nearly € 1 million) may serve as an example. The budget of other important programmes ranges between € 250 and € 350 thousand and have been assigned to recovery of the landscape and ethnological elements, planning of public forests, improving the habitats in public mountains or restoration of habitat, and vegetation on *dehesa* pasturelands.

As depicted in Figure 2, there has been significant growth of the budget dedicated to conservation, going from € 1.6 to 2.3 million.

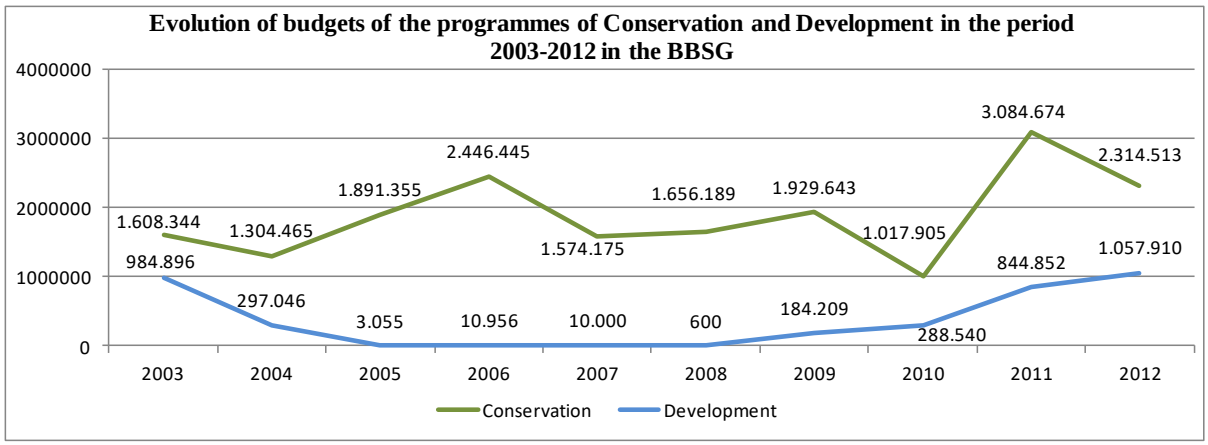


Figure 2. Evolution of budgets of the programmes of Conservation and Development in the period 2003-2012 in the BBSG.

In the last ten years covered by the Decennial Report, the amount spent on economically quantified development programmes has increased to € 3 682 061. This amount corresponds to actions aimed at strengthening public use. Conservation and improvement of visitor facilities, including visitor centres, museums, nature classrooms, or botanical gardens, and PA signage system are the two most prominent programmes (84.1% and 15.8%, respectively).

Although the budgets for development programmes for the initial and final years are similar, the intermediate period is characterized by minimal investment, which in 2008 barely reached € 600.

The available economic data shows that the distance between conservation and development efforts did not decline. However, it should be noted that since 2009, the budgetary trend of development programmes increased. This trend reinforces the aforementioned actions for public use.

In addition to programmes with budgets channelled through the Natural Park Sierra de Grazalema, there are other conservation and development measures without assigned budgets. Both measures were considered together in the following sections.

5.1.2 All programmes, with or without budgetary information.

The second classification of all measures, both with and without economic information, were considered when quantifying the total number of implemented programmes by type. This approach provides additional information about the attention given to diverse lines of intervention.

The resulting classification enables us to conclude that there have been 63 conservation programmes and 84 related to development (Table 2). The larger number of measures implemented in development may lead us to think that there are more management tasks conducted in this field. However, what has to be considered is that these actions generally are minimal with respect to spatial, temporal, and budgetary extents. Moreover, the total number of development measures was not significant until 2006 which aligns with the initiation of the Sustainable Development Plan (SDP). This Plan includes programmes that cover a broad spectrum of initiatives favouring economic activity in its various sectors. As mentioned in the theoretical framework, the development of such Plans is a notable feature for the management implemented in the PA of Andalusia.

Table 2. Number of programmes of Conservation and Development in the period 2003–2013 in BRSG.

CONSERVATION	Nº	Nº	**DEVELOPMENT**
Of Nature			**Primary Sector**
Direct	40	4	Direct Production
Indirect	18	4	Indirect Production
			Secondary Sector
Of Cultural Heritage		3	Direct Production
Direct	3	4	Indirect Production
Indirect	2		**Tertiary Sector**
		7	Direct Production
		36	Indirect Production
			Primary and Secondary S.
		2	Direct Production
			Primary and Tertiary S.
		2	Direct Production
		1	Indirect Production
			Secondary and Tertiary S.
		3	Indirect Production
			Prim., Second. and Tert. S.
		4	Direct Production
		14	Indirect Production

Regarding conservation efforts, the majority of these programmes have an influence on ecosystems, which has been classified as direct influence (40 out of the 63 implemented programmes). These programmes include control and conservation of wildlife measures: endangered species in general and other species such as roe deer or wild goats, scavengers, river populations, or the Bonelli's eagle and the Egyptian vulture. Programmes related to flora focus on the overall management of threatened species and on conservation of pastureland habitat, the bulbous species or pteridophytes, and others. Another relevant group of measures include those aimed at preventing wild fires.

In parallel, a series of programmes for indirect promotion of the conservation of nature have been implemented. These programmes primarily focus on raising public awareness of environmental issues (18 out of the 63 programmes are aimed at conservation). Although the budgetary allocation for this section is not significant, there is a large set of actions related to

environmental education and divulgation through activities with schoolchildren, elderly, volunteers, workshops, and nature activities.

Among conservation efforts, some initiatives, whose purpose is linked to management of the cultural and landscape values of the BRSG, have emerged. Although the five measures in this field represent just 2% of the total economic investment in conservation, increased attention has been given to components of cultural heritage. Four out of the five actions took place after 2010. It is noteworthy that none of the initiatives were related to intangible assets, but rather to ethnological and architectural heritage. Such actions as the "Protection of the White Villages" or "The Recovery of Landscape and of Ethnological Elements of BRSG" may serve as good examples.

Focusing on the type of programmes aimed at promoting socioeconomic development in the Decennial Report, it can be observed that the Tertiary Sector received the biggest attention; 43 programmes refer to this sector and another 24 affected it, while also promoting the Primary and Secondary Sectors. Among the actions aimed at boosting the Service Sector, the group of 26 programmes destined at Public Use were especially relevant. Additionally, the actions for the promotion of tourism and training courses for the population should also be highlighted. The set of actions in the category Public Use can be classified as a part of the group of programmes which may have a positive indirect influence on economic activity. Tertiary activities have been indirectly supported by 54 programmes and directly by 9 actions aimed at promoting companies of this sector.

The eight programmes associated with the Primary Sector mainly include measures to improve production (e.g., promotion of eco-practices). Nonetheless, the programmes related to hunting and fishing use should also be highlighted. The other five programmes, which can be linked with other economic sectors, try to link primary production with processing and marketing, seeking synergies and strategies to maintain the added value.

In the case of the Secondary Sector, with seven programmes and another five linked to other sectors, actions aimed at fomenting industrialization, promotion of traditional manufacturing practices and at optimization of energy consumption should be highlighted.

5.2 Analysis of socioeconomic evolution

5.2.1 Demographic evolution

In the area of socioeconomic influence of the BR Sierra de Grazalema the total population, which lives in 14 municipalities, amounts to 80,015 inhabitants (Table 3).

Table 3. Main age groups in 2001 and 2011.

	2001	**2011**
Under 16	14 308	13 020
16-64	51 800	53 450
65 and up	12 258	13 545
TOTAL	*78 366*	*80 015*

Source: self-elaboration using data of Census of 2001 and 2011 of the INE.

This population is mainly concentrated in Ubrique and Ronda villages (66.82% of the total population). The remaining 12 municipalities, much smaller in size relative to Ubrique and Ronda, do not exceed 5800 inhabitants (INE, 2016). The smallest, Villaluenga del Rosario, has 448 people.

Between 2003 and 2013, there has been an increase of 0.91% in the total population. However, in eight out of the 14 municipalities, the number of inhabitants decreased, indicating that the registered growth is concentrated in the largest municipality, Ronda. An indicator of the process of gradual aging of the population in these rural areas is the balance between the youngest and the oldest inhabitants. This balance allows for us to observe whether there is a real population replacement. Between the Population Census of 2001 and 2011, both the adult age and the over-65-year-old groups increased. The balance between young and elderly people evolved from 85 elderlies to 100 young people in 2001 to 104 in 2011. This deficit in the younger population is well above the data recorded in the provinces of Cadiz and Malaga, where currently the proportion is 83 elderlies to 100 young people

5.2.2. Labour market

If we compare the data from censuses of 2001 and 2011, an increase in the working population can be observed (Table 4). At the same time, the differences between men and women have decreased as a result of a higher incorporation of females into the labour market. In 2001, women formed around 37.3% of the active population. A decade later this percentage has increased to 46.89%.

Although there has been a decrease of 2% in the working population between 2001 and 2011, at the same time there was an increase in the working female population.

Table 4. Working and unemployed population in 2001 and 2011.

	Working Population			**Unemployed Population**		
	Men	**Women**	**Total**	**Men**	**Women**	**Total**
2001	16497	7786	24283	4846	4909	9755
2011	13474	10338	23811	8187	8803	17066
Difference 2001- 2011	*-3023*	*2552*	*-472*	*3341*	*3894*	*7311*

Source: self-elaboration using data of Census of 2001 and 2011 of the INE.

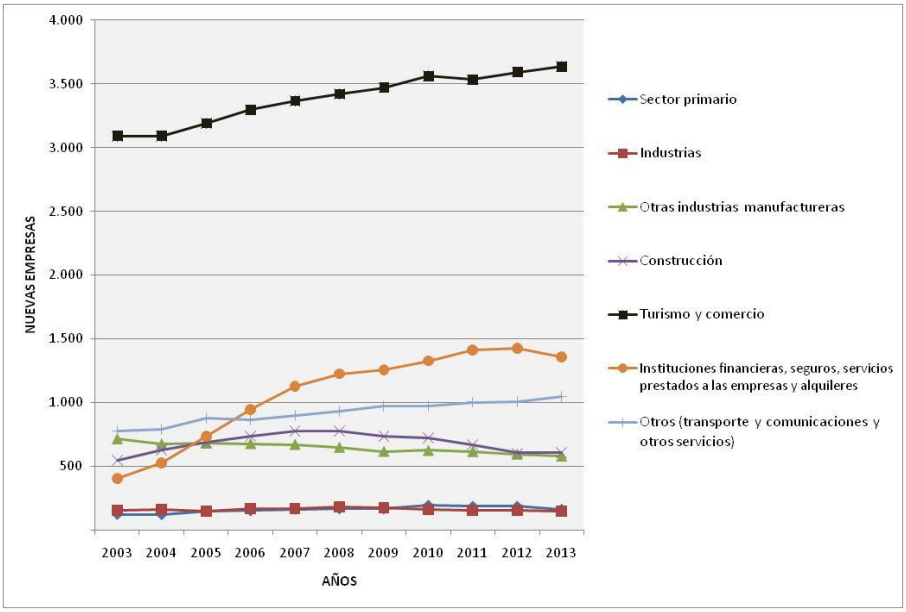
Unemployment has almost doubled in the last ten years, affecting a total of 9755 people in 2001 and more than 17,000 in 2001. This trend is a result of the global economic crisis (Méndez 2014), which had its peak in 2008 and which, among other economic consequences, has caused a decline in the employment rate and a significant destruction in the workforce (Ruiz et al. 2015).

5.2.3 Economic activities

Traditionally this zone has had a strong Secondary Sector (Jiménez et al. 2014), which has been the engine of the local economy during many years. Manufacturing and the food production were the most important sectors. Over time the Service Sector, especially the

hotel industry and commerce, has been consolidated. The Construction Sector should also be emphasized (Figure 3).

In 2003, the Service Sector became the main pillar of the local economy. Today 75% of the companies in the area and 54% of the registered contracts belong to this sector.



Source: SIMA (2016). IECA Junta de Andalucía.

Figure 3. New companies created between 2003 and 2013.

The productive structure of the economy allowed for a better accommodation of the consequences of the 2008 economic crisis. Due to lower participation of the construction sector, which was most affected by the crisis, the generally positive trend toward new company creation has been maintained (1730 new companies since 2003). Since 2009, 5219 new contracts have been registered. With regard to the business structure in the area, there has been an increase in the number of microcompanies (i.e., characterized by two or less employees) between 2003 and 2013. During the studied period, the proportion of such companies increased from 78.7% to 83.51%. There has been a drastic reduction of 263 companies with more than three employees.

5.2.4 Primary Sector

Agriculture has had minimal influence on this area's economy. The negative scenario for this sector is influenced by factors such as the reduction of cultivated area by 10% and the predominance of extensive cultivation, which is not labour intensive.

According to the Agricultural Census of 2009, the main cultivated plants were herbaceous, occupying 66% of the land. Their presence is linked to livestock breeding. Olive trees are the second most important cultivar (32%) and form the basis for the local production of olive oil.

Stockbreeding, which is predominantly extensive, and the exploitation of forest resources are the most important activities within the Primary Sector in the BR. Stockbreeding is one of the basic pillars of the economy of the area. Ovines, caprines, and bovines form 80% of the livestock that are raised (Table 5). Nevertheless, between 1991 and 2009 there has been a decrease in livestock. Only the livestock of ovines and equines has increased over the studied period.

Table 5. Type of livestock in cattle units

Year	**Bovine**	**Ovine**	**Caprine**	**Equine**	**Porcine**	**Avian**	**Mother-rabbits**
1999	11608	7045	6831	1144	9407	11209	9
2009	9562,7	7264,1	4863,4	1181,6	7536,1	94,9	0,4

Source: Agricultural Census of 1999 and 2009. IECA Junta de Andalucía.

Despite the decrease in bovines and caprines, this subsector keeps growing in terms of the number of companies and contracts linked to the transformation of meat and milk products.

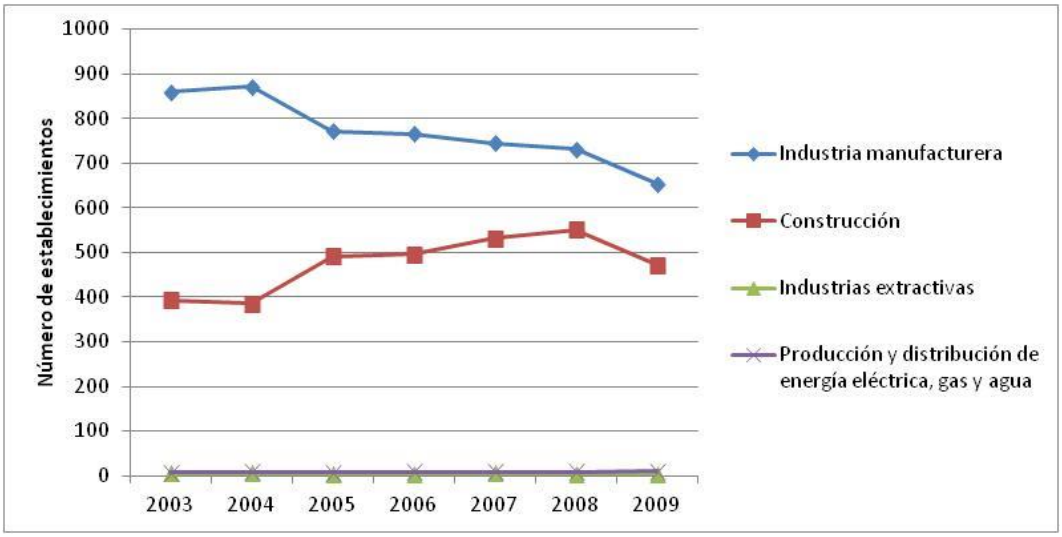
The value of this sector in society is additionally fomented by diverse initiatives, such as the promotion of the autochthonous breeds of livestock, the *pajuna* cow, the *payoya* goat, and the *merina* sheep. The two latter are in danger of extinction. There has also been a range of activities which promote traditional activities such as shepherding.

In recent years an increase in the ecological farming and breeding has also been observed. The number of farms which apply ecological methods has increased from 24 in 1999 to 128 in 2009, forming 12% of the cultivation fields in the BR. Ecological breeding is gradually being affected by transformation from traditional models.

5.2.5 Secondary Sector and Construction

Among the industries in the studied area, manufacturing is the main subsector. This subsector has always been important in the zone, both in terms of employment and the number of existing companies. It has been concentrated on such activities as production of leather goods or food and drinking industry (Parque Natural Sierra de Grazalema 2005).

Since 2004, there has been a clear decrease in the number of manufacturers. In 2009, there were 205 less than in 2003 (Figure 4). At the same time there was a reduction of 18% of the inscriptions in Economic Activities Tax (EAI).



Source: self-elaboration from data of SIMA. IECA Junta de Andalucía

Figure 4. Number of establishments by economic activity.

According to the Industrial Register, investment in this subsector has also substantially decreased. In 2006, €3.8 million had been destined for acquisition of equipment, land, buildings, and construction. In 2012, this number was drastically lower amounting to €125.000. There was a significant increase in the number of contracts in industrial sector in 2009 and 2013.

The construction sector continued to grow gradually until 2008. The economic crisis had led to a change in this tendency. As a result, a significant share of 611 companies in the construction sector, which existed in 2003, has disappeared. In 2013, only 417 remained. The same process has affected the number of registered contracts, which between 2009 and 2013 has decreased by 29%.

5.2.6 Tertiary Sector

The Tertiary Sector was consolidated as the economic motor of the socioeconomic area of the RBSG. Despite the recession, this sector has continued to grow. Between 2007 and 2013, 100 new companies have been created. Today, 53.97% of all contracts are in the Tertiary Sector.

The strengthening of this sector can be explained by the importance of tourism and other activities linked to it in the studied area. As shown in the Figure 4, new companies linked with commerce and tourism outnumber those of the rest of economic subsectors.

For a long time, the BRSG has been a protected area with elevated environmental, landscape, and cultural values, which have all attracted tourism. In 2013, this PA received 45,741 visitors, making it the fifth most popular protected area in Andalusia.

One of the expressions of the increasing tourist demand of the region is the fact that the number of rural tourism companies has doubled from 52 in 2003 to 109 in 2013. The number of different types of accommodations (e.g., hotels, apartments, hostels) has increased by 18%.

Diverse initiatives have emerged in relation to the development of tourism in this area. These include the European Charter for Sustainable Tourism promoted by the EUROPARCS Federation and the brand Natural Park, both of which promote tourism development focused on sustainability (Jiménez et al. 2014).

6. DISCUSSION AND CONCLUSIONS

In the present context, the underlying rationale of the management of Biosphere Reserves seems to be founded on multifunctionality of the PA and on the consensus as to the need for a global and integrated management model. On the theoretical level, the idea that there is the necessity to reconcile environmental conservation with social development and transform the PA into model regions for sustainable regional development seems to be increasingly accepted (Gamper et al. 2007; Hammer et al. 2012, 2016).

In the case of Andalusian BR and BRSG, we have seen that in practice, there is a part of the actions intended to promote socioeconomic development which demonstrates growing concern about this issue. However, if we analyze the budget allocated to each area of activity, management continues to provide considerably higher attention to the actions of nature conservation than to development. In addition, during the studied decade, there has been an increase in conservation expenditures for the natural environment, while no substantial change in the volume of investments for development has been recorded.

The second outstanding result of this study was the fact that almost 80% of the actions included in the development area are intended directly or indirectly for the development of the Tertiary Sector. Continued encouragement of recreation and tourism activities can be observed. In this context there is a strong commitment to the actions of public use, which constitute 100% of the programmes for which budgetary data is available in BRSG.

Investment in different types of facilities such as reception centres, tracks, and teaching spots have the ultimate purpose of increasing the number of visitors. These facilities serve as key resources for tourism. These are elements that should act as facilitators of productive activities in the Service Sector and, ultimately, contribute to making private businesses viable.

However, this connection is not always as obvious as shown by research in the PA near the Sierra de Grazalema. According to the results of the project "Methodological Development on Capacity Assessment for Recreational Uses of Protected Areas", in the Natural Park Sierra de las Nieves, "between 75% and 80% of hikers have not used any private service" (Gómez 2016:630). Along similar lines, the referenced project shows that customers of private services do not make use of public service facilities (Ocaña et al. 2012).

The rest of the actions for local socioeconomic development are focused on the promotion of the quality production through the creation of certified brands, awards, and marketing activities. They also support professional training and entrepreneur formation in order to increase the productive fabric.

At the same time, programmes that directly support the local productive economy are scarce. These programmes focus on production and commercialization of organic products, mainly linked to stockbreeding. The management reports also include information on a series of support programmes for the entrepreneurial projects with innovative character. Nonetheless, these measures are implemented by agencies whose connection with the managers of the BR is very limited. For this reason, the data on these initiatives provided in the reports is not precise.

In relation to this, it is important to emphasize that diverse agents of local and rural development, who work in the territory of Sierra de Grazalema, develop their activities both in protected and non-protected rural areas. There is no specific connection between BR managers and those agents who work in the same territory and whose discourse is increasingly focused on sustainability. For this reason, we argue that there is a need for management instruments that would have the capacity to coordinate the actions of diverse social agents that operate in the same space. This approach applies specifically to those whose work focuses on local and rural development (Fuentes et al. 2011; Troitiño et al. 2005).

As for the socioeconomic evolution of the municipalities in the area of BRSG influence, the figures are not favourable when it comes to population dynamics. The population growth has been very modest and it is concentrated mainly in bigger municipalities, while the smaller municipalities have continued to decrease. The demographic structure is profoundly affected by this process. Population decrease is a key factor, which affects the continuity of the processes of local development in the framework of the BRSG.

On the other hand, the working population has not increased despite the noticeable incorporation of women into the labour market. This situation is profoundly linked with the economic crisis, which has translated into an extraordinary increase in unemployment.

The economy has been affected by important changes in terms of sector structure. The Primary Sector has been reduced. The agricultural subsector and livestock breeding have been specifically affected. In the latter subsector, there has been a decrease in the number of animals that are bred. Nevertheless, the increase in creation of companies and contracts linked to the transformation of agricultural products has been maintained. The differentiation in terms of production of certified quality, especially of organic character, has led to a renovation of the sector.

Traditional manufacturers' numbers have declined. Due to the increase in the number of visitors to the region and tourist companies the Service Section is the main pillar of the local

economy. As a result, the local economic structure is characterized by decompensation, which is a phenomenon recognized by other scholars (Rodríguez 2001; Jiménez et al. 2015).

Although we cannot establish a linear relationship between the model of management applied in the BRSG and the evolution of socioeconomic conditions in its area of immediate influence, we can see certain parallelisms between the types of activities conducted with an aim of fomenting development and the orientation of some productive activities. In this sense we can recognize possible cause-effect relationships between the support given to organic production, the protection of autochthonous breeds or the promotion of the quality brands, and the increase in the diversified products linked to environmental quality and the local brand. Along the same lines, it is possible to conclude that the environmental administration, similar to other local public and private agents, is clearly committed to the development of tourist activities. The latter have become a priority in reserve management and a key element for private investment. This observation does not mean that a common strategy is not shared by all actors that intervene in the territory or that there is a line of work that aims at the creation of synergies between the managers of the Reserve or other agents who influence the territory and the private economic actors.

Although we cannot ignore environmental management initiatives aimed at stimulating lines of work for fomenting sustainable development of the local populations, there are clear indicators of the insufficiency of the applied measures. The most important one is the stagnation or even reduction of the population, along with the disequilibrium of the economic structure (i.e., excessively concentrated on tourist activity) and little support for the direct productive activities (Troitiño et al 2005; Jiménez et al. 2015).

The recognition of this situation obliges us to continue looking for formulas that can guarantee sustainable development in the region. The positive evolution of the local economy is much more important for guaranteeing the conservation objectives of the protected areas than has been previously recognized (Hammer et al. 2012, Jiménez et al. 2015). The social and economic environment strongly influences the state of the landscape and the diversity of the habitats, among which many are seminatural systems. Also, the conservation of the cultural heritage of the region depends on the sustainability of the local communities, which, at present, are profoundly affected by aging and depopulation.

REFERENCES

Antón-Clavé, S., Blay-Boqué, J. and Salvat-Salvat, J. 2008. Turismo, actividades recreativas y uso público en los parques naturales. Propuesta para la conservación de los valores ambientales y el desarrollo productivo local. *Boletín de la Asociación de Geógrafos Españoles*: 48: 5-38.

Batisse, M. 1982. The Biosphere Reserve: A Tool for Environmental Conservation and Management. *Environmental Conservation*: Vol. 9, Nº 2: 101-111.

Becerra-Parra, M. 2002. Nuevas aportaciones al conocimiento de la flora de la Sierra de Libar (Parque Natural Sierra de Grazalema, Málaga). *Acta Botanica Malacitana*: 27: 323-326.

Cantos-Mengs, F.J., De Torres-Suárez, A. and Beltrán-Díaz, N. (coord.) 2010. *Guía de Reservas de la Biosfera Españolas. Armonía hombre-naturaleza*. Madrid: Ed. Organismo Autónomo Parques Nacionales. Ministerio de Medio Ambiente y Rural y Marino.

Cianga, N. and Popescu, C.A. 2013. Green Spaces and Urban Tourism Developmentin Craiova Municipality In Romania. *European Journal of Geography*: 4 2 34-45 (2013).

Consejería de Medio Ambiente y Ordenación del Territorio (CMAOT). Último acceso 2016: http://www.juntadeandalucia.es/medioambiente/site/portalweb/menuitem.7e1cf46ddf59bb227a9ebe205510e1ca/?vgnextoid=53ec5e5cb3359010VgnVCM1000000624e50aRCRD&vgnextchannel=5b5d74ee211f4310VgnVCM1000001325e50aRCRD

Datos Espaciales de Referencia de Andalucía para escalas intermedias (DERA). Instituto de Estadística y Cartografía de Andalucía. Consejería de Economía y Conocimiento de la Junta de Andalucía. Último acceso 2016: http://www.juntadeandalucia.es/institutodeestadisticay cartografia/DERA/

DECRETO 383/2011, de 30 de diciembre, por el que se declaran determinados Monumentos Naturales de Andalucía en la provincia de Málaga y se dictan normas y directrices para su ordenación y gestión. Boletín Oficial de la Junta de Andalucía nº 8, pag. 33 (2012).

Dudley, N. (Ed.) 2008. *Directrices para la aplicación de las categorías de gestión de áreas protegidas*. Suiza: Unión Internacional para la Conservación de la Naturaleza y de los Recursos Naturales (UICN).

Frys, W. and Nienaber, B. 2011. Protected areas and regional development: conflicts and opportunities –presented on the example of the Unesco Biosphere Reserve Bliesgau. *European Countryside*: vol. 3, issue 3: 208-226.

Fuentes, M.C., Otón, M.P., Quintá, F.J.A. and Arce X.C.M. 2011. The Natura 2000 Network in Spain and its Lack of Protection. *European Journal of Geography*: 1 (2011).

Gamper, C., Heintel, M., Leitner, M. and Weixlbaumer, N. 2007. Nature Parks and Regional Development in Austria: A Case Study of the Nature Park Ötscher-Tormäuer. In *Protected Areas and Regional Development in Europe. Towards a New Model for the 21st Century*, ed. Mose, I., 75-98. England: Ashgate Publishing Limited.

Garayo-Urruela, J.M. 2001. Los espacios naturales protegidos: entre la conservación y el desarrollo. *Lurralde Investigación y Espacio*: 24 (2001): 271-293.

Gómez-Moreno, M.L. 2010. Los espacios naturales protegidos como categoría de ordenación del territorio. El caso de la Comunidad Autónoma andaluza. *Cuadernos Geográficos*: 47 (2010-2): 317-346.

Gómez-Moreno, M.L. 2016. Montañas mediterráneas y espacios protegidos en España: oportunidades y amenazas para su desarrollo local. In *Profesionales y herramientas para el desarrollo local y sus sinergias territoriales. Evaluación y propuestas de* futuro, ed. Martínez-Puche, A., Amat, X., Sancho, I and Sanchiz, D., 621-637. Sant Vicent del Raspeig: Universitat D´Alacant.

Hammer, T., Mose, I., Scheurer, T., Siegrist, D. and Weixlbaumer, N. 2012. Societal research perspectives on protected areas in Europe. *Eco.mont – Journal on Protected Mountain Areas Research and Management*: Vol. 4 N. 1: 5-12.

Hammer, T., Mose, I., Siegrist, D. and Weixlbaumer, N. (ed.) 2016. *Parks of the future: Protected areas in Europe challenging regional and global change*. Oekom Verlag.

Hynek, A. and Trávnicek, J. 2010. Environmental Targets and Measures in the Strategies and Programmes of Regional Development in the Czech Republic. *European Journal of Geography*: 1 (2010).

Instituto Nacional de Estadística (INE). Último acceso 2016: http://www.ine.es/welcome.shtml

Jiménez-Olivencia, Y., Caballero-Calvo, A. and Porcel-Rodríguez, L. 2014. Informe Decenal de la Reserva de la Biosfera Grazalema 2003-2013. Madrid: Ministerio de Medio Ambiente. Work document.

Jiménez-Olivencia, Y., Porcel-Rodríguez, L. and Píñar-Álvarez, A. 2010. Evolución histórica de los paisajes del Parque Nacional de Sierra Nevada y su entorno. In *Proyectos de investigación en Parques Nacionales 2007-2009*, ed. Ramírez, L. and Asensio B., 109-128. Madrid: Organismo Autónomo Parque Nacionales, Ministerio de Medio Ambiente y Medio Rural y Marino.

Jiménez-Olivencia, Y., Porcel-Rodríguez, L. and Caballero-Calvo, A. 2015. Medio siglo en la evolución de los paisajes naturales y agrarios de Sierra Nevada (España). *Boletín de la Asociación de Geógrafos Españoles*: 68: 205-232.

Méndez-Gutiérrez del Valle, R. 2014. Crisis económica y reconfiguraciones territoriales. In *Geografía de la crisis económica en España*, coor. Albertos-Puebla, J.M. and Sánchez-Hernández, J.L., 11-38. Valencia: Ed. Universitat de Valencia

Minguez, C. 2012. The Management of Cultural Resources in the Creation of Spanish Tourist Destinations. *European Journal of Geography*: 3 1 68-82

Mose, I. and Weixlbaumer, N. 2006. Protected Areas as a Tool for Regional Development?. In *Exploring the Nature of Management. The Third International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas*, ed. Siegrist, D., Clivaz, C., Hunziker, M. and Iten, S., 149-154. Rapperswil: University of Applied Sciences.

Mose, I. and Weixlbaumer, N. 2007. A New Paradigm for Protected Areas in Europe? In Mose, I. (Ed.). *Protected Areas and Regional Development in Europe. Towards a New Model for the 21st Century*. England: Ashgate Publishing Limited.

Ocaña, C, Gómez, M.L., Arrebola, J.A., Blanco, R., Galacho, F.B., Larrubia, R., Luque, A.M., Mérida, M., Navarro, S., Rubio, L.M. and Vías, J. 2012. Desarrollo metodológico sobre la evaluación de la capacidad de uso recreativo de espacios protegidos desarrollo metodológico sobre la evaluación de la capacidad de uso. *Nimbus*: 29-30: 447-460.

Parque Natural Sierra de Grazalema, 2005. Asistencias Técnicas Clave. En *Estudio sobre la evolución socioeconómica de los municipios que integran el área de influencia socioeconómica de los veinticuatro parques naturales de Andalucía*. Sevilla: Ed. Consejería de Medio Ambiente de la Junta de Andalucía. Work document.

Porcel, L., Camacho, J., Jiménez, Y. and Paniza, A. 2015. Trees Outside Forest in the Agrarian Landscape of Mediterranean Mountain Regions: The Case of Sierra de la Contraviesa, Spain. *European Journal of Geography*: 6 4 21–34 (2015).

Red Española de Reservas de la Biosfera (RERB). Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO). 2016. Last access 2016: http://rerb.oapn.es/index.php/red-espanola-de-reservas-de-la-biosfera/que-es-la-rerb

Rodríguez-Martínez, F. 2001. Las montañas andaluzas en la encrucijada del desarrollo rural. *Ería*: 54-55: 125-139.

Ruiz-Peñalver, S., Porcel-Rodríguez, L., Minguela-Recover, M.A. and Carmona-Peláez, M. 2015. Estudio regional de la vulnerabilidad socioeconómica en Andalucía en tiempos de crisis. In *Análisis espacial y representación geográfica: innovación y aplicación*, ed. De la Riva, J., Ibarra, P., Montorio, R., Rodrigues, M., 2131-2140. Zaragoza: Ed. Universidad de Zaragoza-AGE.

Simancas-Cruz, M.R. 2007. Los componentes estructurales de la política de declaración de áreas protegidas de Canarias: el cambio de paradigma desde la perspectiva territorial. *Boletín de la Asociación de Geógrafos Españoles*: 43: 261-305.

Sistema de Información Multiterritorial de Andalucía (SIMA). Instituto de Estadística y Cartografía de la Junta de Andalucía. Last access 2016: http://www.juntadeandalucia.es/institutodeestadisticaycartografia/sima/index2.htm

Sobral-García, S., González-Morales, A., Armengol-Martín, M. and Hernández-Luis, J.A. 2011. La Reserva de la Biosfera de Gran Canaria: La articulación entre la preservación del medio y el desarrollo sostenible. *Boletín de la Asociación de Geógrafos Españoles*: 57: 57-78.

Tolón-Becerra, A. and Lastra-Bravo, X. 2008. Los espacios naturales protegidos. Concepto, evolución y situación actual en España. *M+A. Revista Electrónic@ de Medioambiente*: 5: 1-25.

Troitiño-Vinuesa, M.A. 1995. Espacios naturales protegidos y desarrollo rural: una relación territorial conflictiva. *Boletín de la Asociación de Geógrafos Españoles*: 20: 23-37.

Troitiño-Vinuesa, M.A., de Marcos-García-Blanco, F.J., García Hernández, M., del Río-Lafuente, M.I., Carpio-Martín, J., de la Calle-Vaquero, M. and Abad-Aragón, L.D. 2005. Los espacios protegidos en España: significación e incidencia socioterritorial. *Boletín de la Asociación de Geógrafos Españoles*: 39: 227-265

UNESCO. 1996. Reservas de biosfera: La Estrategia de Sevilla y el Marco Estatutario de la Red Mundial. París: UNESCO.

http://unesdoc.unesco.org/images/0010/001038/103849sb.pdf

UNESCO. 2008. Plan de Acción de Madrid para las Reservas de la Biosfera (2008-2013). http://unesdoc.unesco.org/images/0016/001633/163301s.pdf

UNESCO. 2016. Plan de Acción de Lima aprobado durante el 4° Congreso Mundial de Reservas de Biosfera el 17 de marzo de 2016, y aprobado por la 28° Reunión del CIC del MAB el 19 de marzo de 2016, Lima, Perú. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Lima_Action_Plan_es_final.pdf

Unión Internacional para la Conservación de la Naturaleza y de los Recursos Naturales (UICN). 2003. El Acuerdo de Durban. http://www.danadeclaration.org/pdf/durbanaccord_sp.pdf

Villa, A. 2010. Servicios Ecosistémicos en las Reservas de la Biosfera de Andalucía, España: expresiones culturales y turísticas. In *Reservas de la Biosfera. Su contribución a la*

provisión de servicios de los ecosistemas, ed. Araya Rosas, P. and Clüsener-Godt, M., 101-118. Francia: UNESCO.

Voth, A. 2016. Recent trends and future challenges of protected areas in southern Spain. In *Parks of the future: Protected areas in Europe challenging regional and global change*, ed. Hammer, T., Mose, I., Siegrist, D. and Weixlbaumer, N. München, 125-136. München: Oekom Verlag.

VV.AA. 2013. *Informe de Medio Ambiente en Andalucía IMA 2013*. Sevilla: Consejería de Medio Ambiente y Ordenación del Territorio.