



## Review

## Social impacts of European Protected Areas and policy recommendations

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## ABSTRACT

Effective designation of Protected Areas (PAs) requires the careful consideration of their social impacts as these are perceived by people. These refer to a variety of issues such as the distribution of power, social equity, social relations and more importantly the impact of PAs on human wellbeing. A number of studies have emerged in the past decade aiming to capture social impacts of PAs across the world through non-monetary assessments taking into consideration people's perceptions. Although Europe is the region with the largest in proportion number of Protected Areas across the world it is also a region with very limited scientific evidence on this topic. As the European Union is preparing to implement its new Biodiversity Strategy to ipkmlment this paper aims to provide the first comprehensive review of the literature regarding social impacts of European PAs and highlight new directions for current policy frameworks in the region. The paper focuses on the perceived non-economic social costs and benefits of PAs and identifies 7 key categories of social impacts. We propose that policy planning for biodiversity conservation in Europe should incorporate subjective assessments of social costs and benefits with the aim to achieve an increase of benefits for people and their equal distribution across social groups.

## 1. Introduction

The designation of Protected Areas (PAs) is a key policy for biodiversity conservation internationally. In 2010, the Parties to the Convention on Biological Diversity (CBD), adopted the Strategic Plan for Biodiversity 2010–2020 and its 20 Aichi Biodiversity Targets, including Aichi target 11 stating that at least 17 % of terrestrial and inland water areas and 10 % of coastal and marine areas, should be protected by 2020. In 2015, the members of the United Nations also adopted the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs). SDGs 14 and 15, recognize the important role of PAs as a key strategy for biodiversity conservation and sustainable development.

Europe has one of the most well-established networks of PAs (Jantke et al., 2016). These protected landscapes are expected to be further expanded in Europe in the next decade following the recent publication of the EU biodiversity strategy aiming to protect 30 % of land and 30 % of water by 2030 (European Commission, 2020). These new targets will influence most countries in the region, similar to other conservation policies, which have started at European Union (EU) level and are then rolled out to other countries, often aspiring to become part of the EU in the future (i.e. NATURA 2000 network).

Despite the large number of European PAs, several exist only on paper (Guidetti et al., 2008). The effectiveness of PAs is often dependent on the level of enforcement (Guidetti et al., 2008) but also on the local institutional and cultural context (Ostrom, 2009). PAs providing benefits for local communities and which consider local characteristics in decision-making processes have higher chances of gaining public support (Yates et al., 2019). Resolution of stakeholder conflicts (Hattam et al., 2014; Mangi and Austen, 2008) and conservation objectives cannot be achieved without support from all entities including members of local communities, resource users, and policy makers.

Taking the above into consideration, significant literature has emerged recently emphasizing the need to capture social impacts of PAs and understand how ecosystem management interacts with the social-economic system (e.g. Naidoo et al., 2019;). This is particularly important for European PAs where EU designations exist alongside national legislations interacting in various ways with the mosaic of cultures that exist in the region.

Despite the fact that Europe has the largest in proportion number of PAs in the world, the majority of studies exploring social impacts focus on the global South (McKinnon et al., 2016; Naidoo et al., 2019) revealing a significant gap for researchers and practitioners working in European PAs. Capturing peoples' perceptions for these impacts is

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crucial in order to fully understand the level of support for PAs (Bennett et al., 2019) and propose actions on how these areas can be designated with a ‘social license’ (Vanclay, 2017) promoting social equality and economic prosperity (Jones et al., 2018). This paper presents the first comprehensive literature review regarding non-economic costs and benefits of PAs in Europe as these are perceived by people. It brings to light how PAs have impacted communities across Europe, identifies shortcomings in current approaches and proposes new directions for researchers and practitioners.

## 2. Social impacts of protected areas

Although there are several studies exploring social impacts of Protected Areas (e.g. West et al., 2006; Jones et al., 2018; Rees et al., 2013a,b) there is no widely accepted definition and classification for these impacts. Influenced by the widely used definition of the International Association of Impact Assessment IASA (IIASA, 2019) we define social impacts of PAs as *the intended and unintended social consequences, both positive and negative, which occur because of the designation of a PA and any social change processes invoked by a PA.*

The literature on ecosystem services (MEA, 2005) and especially the link with cultural ecosystem services and human wellbeing are useful in further defining these impacts, in the context of PAs. Internationally, the most common social impacts assessed are the ones referring to human wellbeing (Pomeroy et al., 2004), social equity and justice (Pomeroy et al., 2004), social relations (Leverington et al., 2010), knowledge (Pomeroy et al., 2004), empowerment (Hockings et al., 2008), local values (Rees et al., 2013b; Stolton et al., 2007) and the impact on social structure (Hockings et al., 2008; Stolton et al., 2007).

A number of studies focus on the benefits of conservation on these broad categories (e.g. Ivanić et al., 2017). However, the designation of PAs is linked both with negative and positive aspects of these impacts for users (Jones et al., 2017, 2018; Oldekop et al., 2015) that need to be taken into consideration both before and after the PA designation. Displacement, limited access to natural resources (Rees et al., 2013a,b), loss of cultural activities (Coad et al., 2008) and decreasing wellbeing levels (Karki, 2013) are just some examples of negative impacts which are often unevenly distributed between users.

For several years the assessment of social impacts was implemented through the application of economic valuation techniques such as the Contingent Valuation Method, Travel Cost Method and cost-benefit analysis (e.g. Kniivilä et al., 2002). In the past decade it has become increasingly evident that other types of assessments are also essential, focusing on non-economic valuations (Voyer et al., 2012) capturing perceptions of people affected by the PA designation (Jones et al., 2018). These subjective assessments are important as they assist in understanding the level of support for PAs (Bennett et al., 2019) and in capturing how costs and benefits are distributed across different social groups (Ward et al., 2018)

## 3. Methods

A systematic literature review was conducted aiming to identify papers and reports in the academic and grey literature focusing on perceived social impacts. The methodology was similar to approaches used in previous review studies (e.g. de Lange et al., 2016d). For this purpose large academic databases were used including Scopus, Google Scholar, Web of Knowledge along with search engines which include mainly grey literature (Google, livelihoods.org, IUCN.org; IEEP.eu; worldbank.org; forestpeoples.org; [www.natureforpeople.org](http://www.natureforpeople.org)). There were two main sets of keywords introduced in these search engines. First, keywords referring to the type of Protected Area. We included here the words ‘Protected Area’ (which includes Marine PAs) ‘Nature Reserve’, ‘National Park’, ‘World Heritage Site’ and ‘Biosphere Reserve’. The second set of keywords referred to social impacts. We included here the words ‘social impacts’, ‘cost’, ‘benefits’, ‘effects’ and we also added

words that specify impacts including: ‘gender’, ‘poverty’, ‘health’, ‘wellbeing’, ‘livelihoods’, ‘social welfare’, ‘social capital’, ‘empowerment’, ‘disempowerment’, ‘power’, ‘equity’ and ‘equality’.

The search resulted to a total of 197,256 documents. These were scanned through (title and abstract) based on three criteria: a) case studies of PAs in European territory, b) assessment of social impacts needed to be either the primary focus of the paper or a sub-section of the research and c) social impacts were assessed by capturing perceptions of different users. This process resulted to 49 papers (full list available on the Supplementary material, Table S1). This number is significantly higher than the number of European studies included in recent global reviews (Ban et al., 2015; Gill et al., 2019). Thus this paper provides the most comprehensive to date review bringing together evidence from case studies across Europe regarding perceived social impacts of PAs. All data were encoded in an excel and SPSS database.

### 3.1. Description of studies included in the analysis

The 49 studies selected to be included in this review were from 17 European countries (Table S1, Supplementary material). The largest studies were 6 national reports (Ivanić et al., 2017) using the PA-BAT tool (Dudley and Stolton, 2009) assessing benefits in several national parks across different East European countries. The number of studies has increased in the past decade, as shown in Fig. 1. 50 % of the studies focused on Marine or coastal Protected Areas which are often considered the most controversial due to conflicts between users. 22.9 % of studies focused on terrestrial PAs and 14.6 % included a combination of terrestrial and marine PAs.

In terms of the tools and techniques used, half of the studies (51.2 %) used a closed questionnaire and 26.8 % used an open-ended interview guide (non-structured or semi-structured). 19.5 % of studies captured impacts through workshops and focus groups and 7.3 % used the participant observation technique. In terms of participants, 46 % of studies targeted locals, (e.g. fishers), 33 % captured the views of several stakeholders (governmental actors, visitors and locals) and 19 % focused only on visitors.

## 4. Results

### 4.1. Social impacts reported in European Protected Areas

The analysis revealed a total of 164 indicators assessing social impacts of protected areas (Table S2, Supplementary material). Based on our review we grouped these indicators into 7 broad categories (Fig. 2):

- 1) **wellbeing and health** including all aspects of wellbeing (e.g. subjective, community), recreation, connectedness to nature and also impact on physical and mental health
- 2) **human rights and access to resources** including indicators that captured issues of accessing resources (such as firewood and

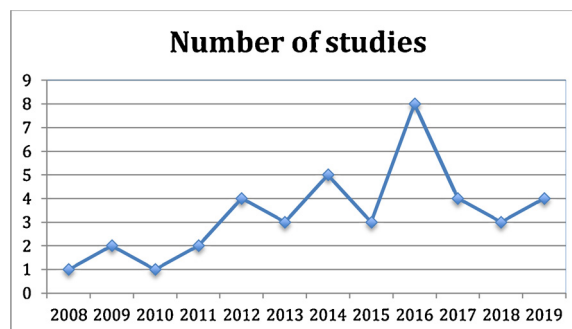


Fig. 1. Number of studies published 2008–2019.

Wellbeing (51%)	Livelihoods (42.8%)	Local culture (34.7%)	Human rights (32.6%)	Soc. relations (32.6%)	Social equity (24.5%)	Knowledge (22.4%)
<ul style="list-style-type: none"> <li>• Quality of life</li> <li>• Cultural wellbeing</li> <li>• Community wellbeing</li> <li>• Connection with nature</li> <li>• Physical and mental health</li> <li>• Recreation</li> </ul>	<ul style="list-style-type: none"> <li>• Individual income</li> <li>• Commercial development (including tourism)</li> <li>• Growth</li> <li>• Stocks of natural resources</li> </ul>	<ul style="list-style-type: none"> <li>• Identity</li> <li>• Place attachment</li> <li>• Heritage</li> <li>• Religion</li> <li>• Spiritual values</li> <li>• Traditional professions</li> </ul>	<ul style="list-style-type: none"> <li>• Regulating activities</li> <li>• Accessibility</li> <li>• Food security</li> <li>• Control of everyday lives</li> </ul>	<ul style="list-style-type: none"> <li>• Conflicts/co-operation</li> <li>• Networks</li> <li>• Human ties</li> <li>• Trust</li> <li>• Community cohesion</li> <li>• Population density</li> </ul>	<ul style="list-style-type: none"> <li>• Empowerment/disempowerment</li> <li>• Level of participation</li> <li>• Distribution of costs and benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental awareness</li> <li>• Scientific knowledge</li> <li>• Educational activities</li> <li>• Environmental behaviour</li> </ul>

Fig. 2. Social impacts of European Protected Areas.

wildfood) and also change in rights;

- 3) **knowledge and education** referring to the impact on educational activities, level of local knowledge for environmental issues and also impact on environmental behaviour because of educational activities
- 4) **livelihoods** which captured mainly the economic impacts especially for specific local groups (e.g. fishers and people working in the tourist sector);
- 5) **local culture** and values referring to a wide variety of local aspects and traditions;
- 6) **social relations** reflecting the change on social networks and structure, the level of trust and the occurrence or resolution of conflicts;
- 7) **social equity, inclusion and empowerment** referring mainly to the distribution of impacts across different parts of local communities in the PAs and also the level of participation in decision-making processes.

#### 4.1.1. Wellbeing

Wellbeing is the impact category most commonly analysed in the literature with 51 % of the reviewed studies measuring some aspect of wellbeing. This result is in accordance with the general tendency in the literature considering the beneficial impact of ecosystems on human wellbeing (MEA, 2005; Naidoo et al., 2019). A wide variety of indicators were assessed which fall under the wider umbrella of wellbeing capturing both subjective wellbeing (at individual level) and the broader community wellbeing (Bennett et al., 2019).

From the studies reviewed, a large part of them focused on the impact on health referring both to physical (Romagosa, 2018) and mental aspects (Burdon et al., 2019). Numerous European PAs provide also the opportunity for humans to be closer to nature, appreciate its' beauty (Bennett et al., 2019; Lopes and Videira, 2019) and enjoy a relaxed environment in tranquillity (Garcia-Lorente et al. 2018; Jiricka-Pürner et al., 2019). A number of recreational activities were mentioned in the different studies influenced from the designation of a PA including diving, fishing and birdwatching all closely linked with the improvement of human wellbeing (Dimech et al., 2009; Rees et al., 2013a; Sekulić et al., 2017a,b). Although the majority of studies identify the positive impacts of PAs on wellbeing, there were also some exceptions where the PA had negative implications especially for locals. Scholtz and Saayman (2018) for example found that the increased number of visitors has caused overcrowding and disturbed the everyday life of locals by increasing noise levels and disrupting tranquillity.

#### 4.1.2. Livelihoods

The designation of PAs often implies significant economic impacts for people (Pham, 2020). As a result there have been growing calls for certain measures to be introduced in order to allow local communities to maintain income levels after the designation of PAs (Dang et al., 2020). The European studies we reviewed reveal significant impacts on people's livelihoods especially due to the change in the use of natural resources. 42.8 % of the studies reported impacts on local communities living near or within a PA. This refers for example to the benefits from increased fish stocks attributed to improved environmental conditions

(Hogg et al., 2019; Rees et al., 2013b). Some PAs also provide the opportunity for new business and entrepreneurial activities, tourism developments, new infrastructure and growth in local employment (Hogg et al., 2019; Oikonomou and Dikou, 2008; Rees and Rodwell, 2012).

Despite these reported benefits, PAs have had also a negative impact on local livelihoods for certain European communities (e.g. Trivourea et al., 2011; Dimech et al., 2009). This is particularly evident in Marine PA (MPA) (see Section 4.3), similar to other parts of the world, as they often impact certain social groups whose occupation (fishers) is directly linked with the use of ecosystems (Bennett and Dearden, 2014). The designation of a MPA often meant that fishers would need to travel longer due to new restrictions in the areas where one can fish resulting to increased costs (Hattam et al., 2014; Mangi et al., 2011). Another issue which was noted in the study of Oikonomou and Dikou (2008) was the unequal distribution of growth and wealth across different stakeholders which often results to a lack of circulation of profits for the community. This was especially evident in this highly touristic PA where individuals involved in tourism related activities benefited the most while more traditional users, such as fishers, were facing higher costs due to the PA designation (Oikonomou and Dikou, 2008).

#### 4.1.3. Local culture and values

Calls to integrate local values in PA decision-making processes have long been raised (Infield, 2002). The results of this review reiterates the fact that PAs impact values in a variety of ways. In the studies we reviewed 37.4 % reported some impact on European local cultures and values. Popa and Bann (2012) provides a useful list of potential heritage and cultural aspects, especially in central-East Europe influenced by PAs, including churches, monasteries, architectural ruins, national symbols and places of special architecture. In several cases PAs have facilitated the protection of a wide set of values such as cultural, spiritual, historical and religious ensuring that cultural activities continue to take place (Burdon et al., 2019; Fagerholm et al., 2016; Garcia-Llorente et al., 2018).

In cases where local values were not incorporated in the planning of a PA this has led to feelings of marginalisation (Jentoff et al., 2012) transforming the PA into a perceived 'threat' by locals rather than an opportunity (Hattam et al., 2014; Hogg et al., 2019). Especially PAs which were highly touristic (for example in Greek islandic communities) there is evidence of abandonment of traditional professions with a higher risk for local and traditional activities to fade (Trivourea et al., 2011). Despite the above evidence there appears to be a lack of studies on how certain important cultural aspects, such as place attachment, have been influenced by PAs. This is an important gap in the literature as often people feel their place identity changing (Anton and Lawrence, 2016) because of a designation.

#### 4.1.4. Human rights and access to natural resources

Restriction on human rights resulting from the designation of a PA has become one of the most crucial barriers for their effective management. The extent of these restrictions often determines the magnitude and direction of the wider social impacts on multiple levels (Mascia and Claus, 2009). When access to natural resources and human rights are not negatively impacted this can lead to synergies among

different stakeholders (Woodhouse et al., 2018) facilitating the management of PAs.

The results of this review reveal that change in human rights is a significant impact for several European PAs. From the publications we reviewed, 32 % mentioned this impact with half of them highlighting benefits and the rest referring to negative issues. In terms of positive changes, new regulations have assisted in controlling illegal fishing (Hogg et al., 2019), protecting territorial rights (Hogg et al., 2019) while improving and regulating accessibility of different social groups (Nenkovic-Riznic et al., 2016). Furthermore, PAs have placed in a more regulatory context the access to certain resources such as collection of firewood, wildfood, and medicinal herbs (Sekulić et al., 2017a, b; Štefan et al., 2016; Veenliet et al., 2018). On the other hand, increased prohibitions means that certain traditional ways of living in European communities have had to change threatening local cultures (Hattam et al., 2014), increasing bureaucratic procedures (Gallo, 2018) and making life more regulated and controlled (Hogg et al., 2019). New regulations also meant the potential relocation in fishing areas (Mangi et al., 2011) and also displacement of traditional property rights (Rees et al., 2013b).

#### 4.1.5. Social relations

The link of PAs with social networking and social relations is not often captured in the literature, thus there is limited evidence on how PAs impact them. The social-ecological systems literature however has shown that dense social networks as part of local social capital can play a crucial role in the process of self-managing initiatives in the context of PAs (McGinnis and Ostrom, 2014). Good social relations mean that people are more willing to come together and manage sustainably a social-ecological system (Ostrom, 2009), such as the one that a PA aims to manage.

In the studies we reviewed 32.6 % found that the PA had a significant impact on the social structure of the community where it was designated. This refers both to relationships among local stakeholders and also the networking of these groups. There is evidence that PAs in Europe have assisted in reducing conflicts (Dimech et al., 2009) and enhanced cooperation between different groups of interest. In certain cases they have also increased the level of trust between users and administrators while improving community cohesion (Burdon et al., 2019). The emergence of new local organisations has also been reported while the increased levels of tourism in certain PAs has been considered a benefit due to the opportunity to meet new people (Trivourea et al., 2011). The increase of tourism however has also had significant negative consequences. In certain cases it has led to overcrowding (Hogg et al., 2019) disrupting significantly the life of local communities by distorting human ties (Trivourea et al., 2011). Furthermore, one of the most indicative and commonly documented impacts of PAs is the increase of conflicts between different users (Hattam et al., 2014). Due to new restrictions and often the non consideration of local values some European PAs have resulted to an increase in conflicts and tensions (Jentoff et al., 2012), making competition for space more intense (e.g. between divers and fishers) (Hogg et al., 2019) and leading to a decrease of trust between stakeholders and a subsequent weakening of social networks (Gallo et al., 2018).

#### 4.1.6. Social equity

Capturing social equity issues has become one of the emerging themes in conservation social science recently (Bennett et al., 2020; Zafra-Calvo et al., 2017). This is because numerous studies have now revealed that the unequal distribution of costs and benefits is one of the most important problems for the governance of PAs (Ward et al., 2018). A quarter (24.5 %) of the studies included in this review have reported significant negative impacts on social equity because of the designation of a PA. These include the marginalisation of certain users (Jentoff et al., 2012), exclusion of social actors due to selective participation (Maestre-Andrés et al., 2018), the unequal distribution of impacts on

livelihoods (Oikonomou and Dikou, 2008; Trivourea et al., 2011), the lack of circulation of profits within members of the same community (Hogg et al., 2019), the development of a sense of unfairness and discrimination for certain groups (Rees et al., 2013b) and disempowerment (Jentoff et al., 2012). There was very limited evidence in the studies reviewed on positive impacts of PAs on social inclusion, equity and empowerment (Pieraccini and Cardwell, 2016).

#### 4.1.7. Knowledge and education

Knowledge and the level of awareness of PA users is another key component in order to achieve self-management of social-ecological systems (McGinnis and Ostrom, 2014;). This is because knowledge can be incorporated in decision making processes through bottom up initiatives assisting in the co-management of PAs (Gerhardinger et al., 2009) and the application of participatory approaches. A positive impact on local knowledge from the designation of the PA could have a circular effect where the designation results to higher environmental awareness, which then feeds back into the system resulting to more responsible environmental behaviour and positive attitudes for the PA (Leisher et al., 2012).

From the studies reviewed 22.4 % reported an impact on knowledge. This included building knowledge among local communities for local ecosystems (Veenliet et al., 2018; Štefan et al., 2016) but also the provision of scientific knowledge (Garcia-Llorente et al., 2018). These type of activities were reported to have two subsequent benefits: an increase in residents' environmental awareness (Rodríguez-Rodríguez and Lopez, 2019) and facilitation for local communities in adopting more environmentally friendly habits (Scholtz and Saayman, 2018). This has also been recorded to feed back into a more positive image of the community as an 'environmentally friendly place to live' (Scholtz and Saayman, 2018). There have however been cases where the knowledge provided was not sufficient for the successful implementation of a PA. Gallo et al. (2018) for example reveal that there was a lack of information regarding the requirements of the NATURA 2000 network implementation leading to an insufficient application of the policy.

#### 4.1.8. Interconnections between the different categories

Dividing the different impacts in distinct categories provides a systematic way to understand their multi dimensionality. However, interconnections between these categories exist and are often quite complex. We would like to highlight here two categories that cut across all social impacts mentioned above. The first is the impact on human rights. This is because the designation of a PA as a policy process is accompanied by a set of regulations (McGinnis and Ostrom, 2014) that users are expected to follow (Veenliet et al., 2018; Štefan et al., 2016). These regulations often bring the main restrictions on human rights and access to natural resources. It is this initial change that has a domino effect on other impacts including changes in behaviour (Hogg et al., 2019), livelihoods (Rees et al., 2013b) and local culture (Hattam et al., 2014). The second category that cuts across all impacts is social equity. This is because the moment an impact is differentiated across groups it also implies an impact in relation to equality issues (Zafra-Calvo et al., 2017; Ward et al., 2018). This was also evident in the studies we reviewed as in most case studies the impacts differed between stakeholders (e.g. Oikonomou and Dikou, 2008; Rees et al., 2013a, b). This means that the 7 categories of impacts should be analysed as strongly interconnected and need to be treated as a bundle and not as unrelated classifications.

#### 4.2. Comparing positive and negative impacts of European PAs

116 of the reported indicators (69.8 %) referred to positive impacts and 48 to negative effects. Most frequent reported benefits were those on human wellbeing (42.86 %) and improvement of livelihoods (32.65 %) (Fig. 3). In terms of negative impacts the most common issues



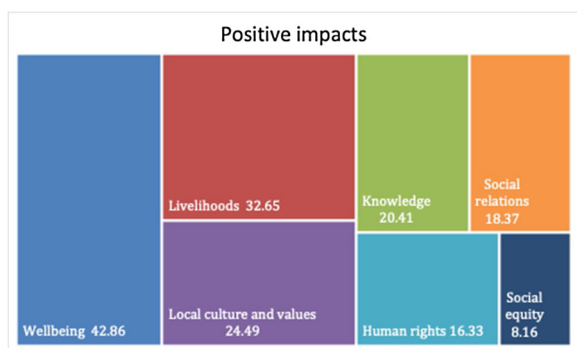


Fig. 3. Studies identifying positive impacts in each category.

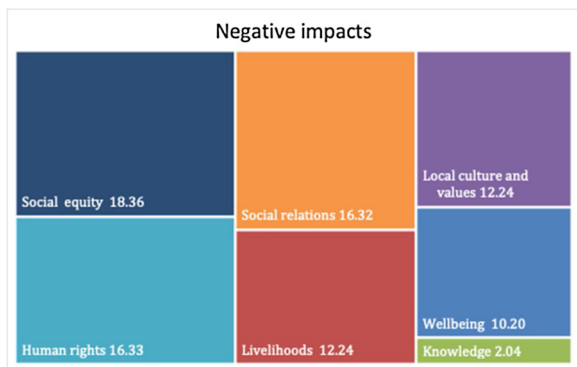


Fig. 4. Studies identifying negative impacts in each category.

reported were related to social inequality (18.36 %) human rights (16.43 %) and social relations (16.42 %) (Fig. 4).

#### 4.3. Differences depending on the participants

In order to explore whether the reported impacts differ depending on the participants of the studies, we divided the reviewed articles on two key user groups: those assessing impacts capturing visitors' perceptions and those capturing locals' perceptions. Studies exploring a mixture of different stakeholders were excluded from this analysis. Overall, studies capturing visitors perceptions identified less frequently negative impacts compared to those which focus solely on locals. Negative impacts on wellbeing and social relations were identified only in studies focusing on locals similarly with positive impacts on human rights and social equity. Positive impacts on wellbeing were identified more by visitors and less by locals while negative impacts on wellbeing were reported only in studies capturing locals' perceptions (Fig. 5) whereas negative impacts on human rights and social equity were reported more by locals compared to visitors.

## 5. Discussion

By reviewing the literature on studies capturing perceptions for social impacts of European PAs we have identified numerous aspects that need to be considered in future debates both by researchers and practitioners in Europe and internationally. We identified seven broad categories of social impacts, revealing a wide variety of social costs and benefits. In this last section of the paper we focus on three key findings and propose directions for future developments in the conservation policy arena.

A first finding of our study refers to the multi-dimensionality of social impacts influencing a social-ecological system in numerous ways. The majority of existing studies focus on the beneficial role that PAs have on key issues such as mental and physical health, income and local

traditions (e.g. Burdon et al., 2019; Romagosa, 2018). This is in line with major policy and scientific documents highlighting the benefits of nature on human wellbeing (Díaz et al., 2018; MEA, 2005). However, as evidenced in this paper, there are also multiple negative impacts that occur because of the designation of a PA which are especially noticeable in case of social issues such as a change in human rights, impact on social relations and social inequality (e.g. Gallo et al., 2018; Hogg et al., 2019).

Policy reports capturing such impacts via non-monetary estimations are very limited in Europe (e.g. Milieu et al., 2016). Thus, although 'nature's contribution to people' is a crucial starting point in the pro-conservation argument there is also a need to increase efforts in order to capture multiple dimensions of benefits and costs of PAs both through subjective and objective assessments. Combining such evaluations could significantly facilitate the planning of necessary actions in order to avoid conflicts and increase public support for PAs.

Our second key point refers to the unequal distribution of impacts amongst different users. Our analysis reveals differences between perceived social impacts depending on the type of users and also the unequal distribution of impacts across different groups (e.g. Rees et al., 2013a, b). Lessons learnt from Southern European MPAs show that perceptions depend on different groups of stakeholders (Mangi and Austen, 2008). The integration of multiple perspectives with the adoption of participatory management practices need to be considered essential for the correct use of such spaces and can indicate the type of PA design that could receive public support, while also ensuring effective conservation (Ruiz-Frau et al., 2019).

Consequently, social impacts cut across different layers of the social structure reaching parts of a particular social-ecological system in a diverse way. For example, fishers and other groups whose work is connected directly with natural resources are usually the first recipients of negative impacts which can often be severe (Trivourea et al., 2011; Rees et al., 2013a). On the other hand, occupations that are linked directly with tourism are often the ones receiving higher benefits (Trivourea et al., 2011). Therefore, apart from the need to assess costs and benefits of conservation, future policies could also to explore how these impacts are perceived and distributed within a community and across different users allowing the development of mitigation measures targeting specific groups.

Our final point focuses on the fact that the current growing efforts by practitioners and scientists which are recorded in this review need to be matched by equal efforts in EU political level. This would allow future conservation policies to be cross-cutting taking into consideration priorities in different domains (Ghermandi et al., 2013) finding ways to overcome conflicting targets between different European policies (European Commission, 2019). In the EU indicative examples are the Common Agricultural Policy, the Common Fisheries Policy and the EU tourism policy. But the most important alignment should be with climate change tackling strategies (Jantke et al., 2016) as it is now widely accepted that nature-based solutions are the way forward for climate change adaptation. Current propositions for a new EU Green Deal could offer a unique opportunity for such cross-cutting policies to be developed in the next decade.

Our key arguments need to be seen within the context of limitations that a literature review entails. Our study brings together evidence for the first time regarding the impacts of European PAs as these are perceived by local residents and other users. The case studies included in the review have applied a variety of methods and the data have been collected across different samples. Our ability to generalise the results of the study across all European countries is limited due to significant geographical variations. Furthermore, due to the scope of the review and the content of the different studies certain issues remain unanswered revealing the need for additional research in the future. An unexplored question is what are the main reasons resulting to these perceptions both in individual and collective level. Another issue is how these perceptions change through time. This gap reveals the limited

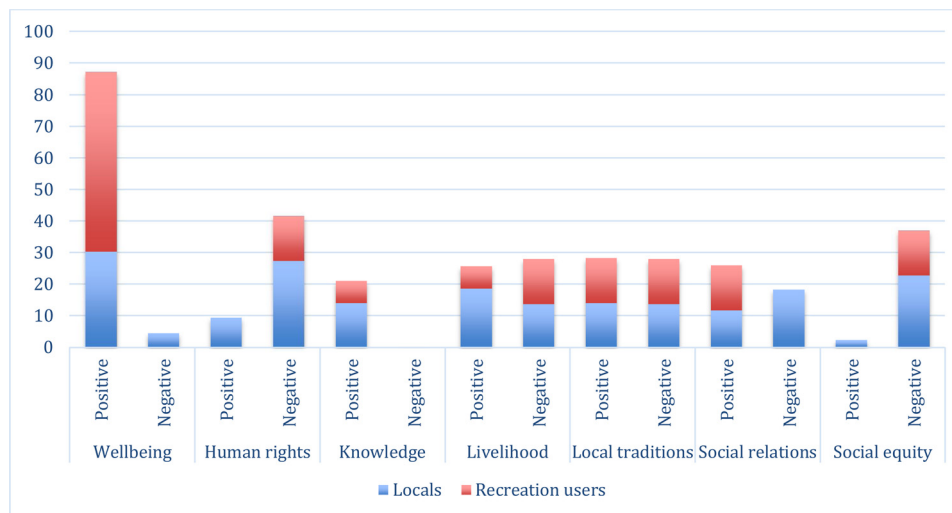


Fig. 5. Impacts identified by visitors and locals.

availability of longitudinal social data in European PAs which could be potentially combined with existing large environmental databases.

## 6. Conclusions

The aim of this paper was to review existing evidence regarding the impacts of Protected Areas in Europe as these are perceived by users. The results of the review reveal that European PAs have significant social impacts on a variety of topics which can be divided in seven categories: wellbeing, social equity, livelihoods, social relations, local tradition, knowledge and human rights. Overall significant beneficial impacts on wellbeing levels are recorded. The unequal distribution of impacts across groups appears to be the most significant issue that needs urgent consideration. Our results reveal that there are several types of social costs and benefits resulting from the designation of PAs that need to be considered when new Protected Areas are designated or existing PAs are expanded in Europe. Assessments capturing social impacts, as these are perceived by users, will be extremely useful in informing decisions in the context of the new EU biodiversity strategy and the proposed new Green Deal.

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## Declaration of Competing Interest

Regarding the submission of the revised manuscript 'Social impacts of European Protected Areas and policy recommendations' we would like to declare that there is no conflict of interest to the best of our knowledge.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.envsci.2020.06.004>.

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