

A.A. Toktarova<sup>1</sup> , C. Ives<sup>2</sup> , A.S. Seitkan<sup>2\*</sup> 

<sup>1</sup>Astana International University, Kazakhstan, Astana

<sup>2</sup>University of Nottingham, United Kingdom, Nottingham

\*e-mail: seitkanainur.77@mail.ru

## CHALLENGES OF PROTECTED AREAS MANAGEMENT

Protected Areas (PAs) is a cornerstone and essential preservation strategies at a national and international level for biodiversity preservation and to maintain healthy ecological function. PAs have continuously been increase over the last decades. However, their effectiveness significantly depends on their management and planning strategies. This paper presents an overview of the main challenges in PAs management. Findings of the present study highlights an importance of involvement of stakeholders in the decision-making process in the management of PAs, public attitudes and perception towards PAs. The understanding of the main challenges in such as uncontrolled human activities (hunting, poaching, fishing), unsustainable development of tourism, climate change also important taking into account in achieving sustainable conservation objectives, and in the design and implementation of new environmental policies. PAs management depends on many interactions such as policy agenda, social and economic situation, cultural issues, stakeholders, individual preferences and governance. Therefore, to conduct an effective PAs management, it is essential to strengthen responses to these multiple obstacles.

**Key words:** environmental management, protected areas management, public perception, climate change, stakeholder's participation.

A.A. Тоқтарова<sup>1</sup>, К. Ивс<sup>2</sup>, А.С. Сейткан<sup>2\*</sup>

<sup>1</sup>Астана халықаралық университеті, Қазақстан, Астана қ.

<sup>2</sup>Ноттингем университеті, Ұлыбритания, Ноттингем қ.

\*e-mail: seitkanainur.77@mail.ru

### Ерекше қорғалатын табиғи аумақтарды басқару мәселелері

Ерекше қорғалатын табиғи аумақтар (ЕҚТА) – биоәртүрлілікті сақтау және салауатты экологиялық функцияны ұлттық және халықаралық деңгейде сақтаудың негізі және маңызды стратегиясы. Соңғы он жылдықтарда ЕҚТА территориясы үнемі өсіп отырды. Алайда олардың тиімділігі көбінесе басқару және жоспарлау стратегияларына байланысты. Аталған зерттеу жұмысы ЕҚТА басқарудағы негізгі мәселелерге шолу жасайды. Осы зерттеудің нәтижелері ЕҚТА басқару шешімдерін қабылдау процесіне мүдделі тараптарды тартудың маңыздылығын, жұртшылықтың ЕҚТА-ны қабылдауда көзқарасын көрсетеді. Адамның бақылаусыз әрекеті (аң аулау, браконьерлік, балық аулау), туризмнің тұрақсыз дамуы, климаттың өзгеруі сияқты негізгі мәселелерді түсіну тұрақты даму мақсаттарына жету кезінде және жаңа экологиялық саясатты әзірлеу мен енгізу барысында да маңызды. ЕҚТА қоршаған ортаны қорғаудың тиімді құралы ретінде танылғанына қарамастан, оларды басқару кезінде көптеген аспектілер қажет. Мысалы, ЕҚТА-ны басқару саяси күн тәртібінде, әлеуметтік және экономикалық жағдай, мәдени мәселелер, мүдделі тараптар, жеке қалаулар және басқару сияқты көптеген өзара әрекеттесулерге байланысты. Сондықтан ЕҚТА-ны тиімді басқаруды жүзеге асыру үшін осы көптеген кедергілерге жауап беру шараларын күшейту маңызды.

**Түйін сөздер:** ерекше қорғалатын табиғи аумақтарды басқару, қоғамдық пікір, климат өзгеруі, мүдделі тараптардың қатысуы.

A.A. Toktarova<sup>1</sup>, K. Ives<sup>2</sup>, A.S. Seitkan<sup>2\*</sup>

<sup>1</sup>Международный университет Астана, Казахстан, г. Астана

<sup>2</sup>Ноттингемский университет, Великобритания, г. Ноттингем

\*e-mail: seitkanainur.77@mail.ru

### Проблемы управления особо охраняемыми природными территориями

Особо охраняемые природные территории (ООПТ) являются краеугольным камнем и важнейшей стратегией сохранения биоразнообразия и поддержания экологической функции на национальном и международном уровнях. В течение последних десятилетий территория ООПТ

постоянно увеличивались. Однако их эффективность в значительной степени зависит от их стратегий управления и планирования. В данной исследовательской работе представлены обзоры основных проблем при управлении ООПТ. Результаты настоящего исследования подчеркивают важность вовлечения заинтересованных сторон в процесс принятия решений по управлению ООПТ, отношение общественности и восприятие ООПТ. Понимание основных проблем, таких, как неконтролируемая деятельность человека (охота, браконьерство, рыболовство), неустойчивое развитие туризма, изменение климата, также важно учитывать при достижении целей устойчивого сохранения, а также при разработке и внедрении новой экологической политики. Несмотря на то, что ООПТ признаны эффективным инструментом сохранения окружающей среды, при управлении ими необходимо учитывать многие аспекты. Так, управление ООПТ зависит от многих взаимодействий, таких, как политическая повестка дня, социальная и экономическая ситуация, культурные проблемы, заинтересованные стороны, индивидуальные предпочтения и управление. Следовательно, для проведения эффективного управления ООПТ важно усилить меры реагирования на эти многочисленные проблемные вопросы.

**Ключевые слова:** менеджмент особо охраняемых природных территорий, общественное восприятие, изменение климата, участие заинтересованных сторон.

## Introduction

Over the last few decades, natural resource management have become a major concern worldwide due to the loss threatening essential ecological processes. For example, biodiversity benefits human well-being and sustains lives on earth by providing valuable direct and indirect ecosystem services, resiliency, and social relations [1]. Therefore, in order to provide conservation efforts, the establishment of Protected Areas (PAs) is a cornerstone and essential preservation strategies at a national and international level for biodiversity preservation and to maintain healthy ecological function. According to IUCN PAs cover around 16% of the world's land area and have continuously been increase over the last decades [2]. Currently, the expansion of the global network of PAs has reached an unprecedented rate and reflects a growing recognition of their value. This is a fundamental element of sustainable development.

Despite the increasing number of PAs, biodiversity is still under threat of extinction worldwide because of destruction of the natural environment over the last 50 years [1]. For instance, populations of wildlife declined 58% all over the world between 1970 and 2012, and there is suggestion of a decline of two-thirds of global biodiversity between 1970 and 2020 [3]. Clearly, conservation of biodiversity in the ecosystem is one of the substantial challenges facing modern society. However, PAs may not be immune to this issue as biodiversity rates continue to decline even within PAs.

Therefore, integrated management of PAs is a vital element of biodiversity conservation. PAs management depends on many interactions such as pol-

icy agenda, social and economic situation, cultural issues, stakeholders, individual preferences and governance. Therefore, to conduct an effective PA management, it is essential to strengthen responses to these multiple obstacles.

Hence, there is no universal solution to effectively manage PAs. Solutions should be linked to the characteristics and natural heritage of each country, the level of its development, the effectiveness of its institutions, and nature and extent of the defects in the prevailing market mechanism, in range of sectors, the nation's priority objectives and targets, and other factors specific to the country.

## The role of protected areas

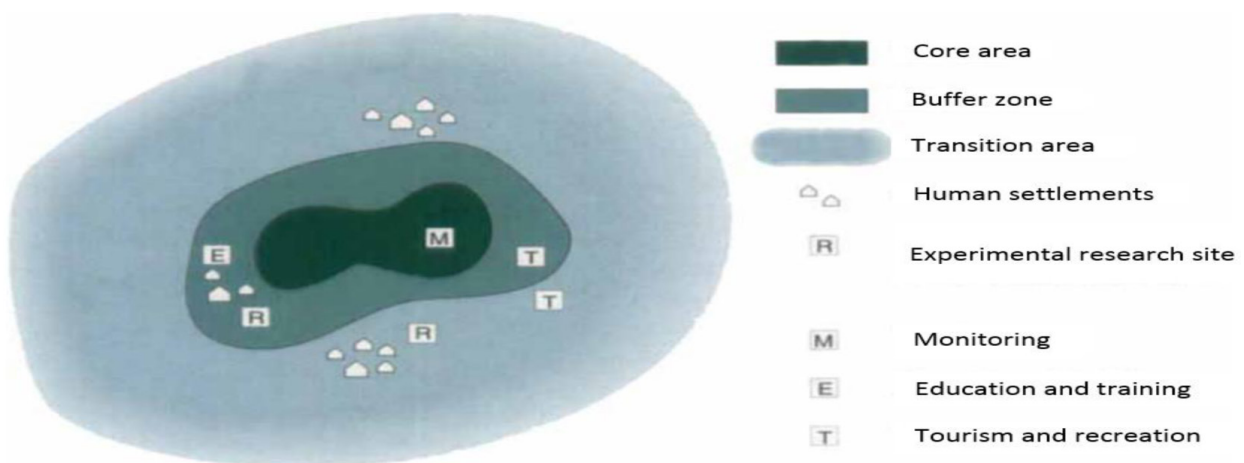
According to the Convention on Biological Diversity (CBD) PAs can be defined as 'a geographically defined area, which is designed or regulated and managed to achieve specific conservation objectives' [4]. The International Union for Conservation of Nature presented a widely accepted definition of PAs, which is a 'clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' [5]. The literature review provided a variety of PAs definitions but all had the similar aim of facilitating the long-term conservation of species and nature within their borders while reducing the impact of human activities [6]. PAs are classified into six categories, which are based on a variety of management objectives, such as the level of protection, restriction (Table 1) [5].

**Table 1** – The categories of protected areas

Category	Definition of Management Objective
<b>Category I a Strict Nature Reserve</b>	Strictly controlled areas for protection of its biodiversity, geological or landform features. They are managed mainly for scientific purposes.
<b>Category I b Wilderness Area</b>	Protected areas without permanent or significant human habitation, which are managed for wilderness protection.
<b>Category II National Park</b>	Large natural or near natural areas dedicated to preserve ecosystem. Can be used for eco-friendly recreation purposes.
<b>Category III Natural Monument/ Feature</b>	Quite small protected areas dedicated for protection of a specific natural monument (landform, seamount, submarine cavern, geological features), often with visitor opportunities.
<b>Category IV Habitat/Species Management Area</b>	Areas, which are managed mainly for protection of particular species or habitats through management intervention.
<b>Category V Protected Landscape/ Sea scape</b>	A protected area of distinct character with significant ecological, biological, cultural and scenic value. The objective is to maintain landscape and biodiversity as well as harmonious interaction of nature and culture. This category can be used for recreation and tourism
<b>Category VI Protected Area with Sustainable Use of Nature Resources</b>	Protected areas managed to ensure long-term protection of natural ecosystems and habitats, together with associated cultural values and sustainable natural resource management and production purposes.

In order to effectively provide conservation initiatives and protect nature from human disturbances, zoning schemes were designed for PAs. This scheme lists the allowable and prohibited activities in the different areas [7]. According to UNESCO, PAs are delineated into three distinct territorial components. The first area is the core area which is devoted to long-term conservation aims, sufficiently large to achieve these goals, and where stricter wildlife conservation is enforced. The second area is clearly

identified as a buffer zone where activities such as scientific research, activities with educational purposes, non-destructive tourism, and natural resource use and recreational activities are allowed. The third zone is the transition zone where people could derive some benefits from this area but sustainable practices are promoted and developed. These territorial zones of PAs could minimise human influence and ensure proper protection within an allocated area (Figure 1).

**Figure 1** – Zoning of Protected areas [7]

However, this zoning system approach is questioned because many PAs are not functioning within boundaries as originally planned despite adequate management systems. This could be explained by the fact that human activities in areas surrounding a reserve could change ecological functioning and species decline within core areas. It has been suggested that issues such as ‘changes in the effective size of protected areas with consequences for a minimum dynamic area, species abundance; alterations in ecological flow into and out of reserves; loss of crucial habitats for seasonal migrations and population source areas; exposure to human activities through poaching, hunting and disease could effect on the ecological processes within reserves’ [8].

For example, changes in ecosystem size could decrease the effective size of the PAs which would also reduce the number of ecological processes and organisms. Therefore, the reduction of effective size could have a negative impact on the ecological functioning and variety of species present in the PAs [8].

Island Biogeography Theory could insert some clarity in this. According to this theory, the number of species in protected areas formed as a balance between species migrated to PAs and those extinct. If nature reserves situated too far from migration routes that feed local fauna, extinction then will be prevailed in fauna formation process affecting to the balance in protected areas and their quantity will continue downward movement [9]. Therefore, it is important to handle carefully the issues of recolonization within the boundaries of PAs. Impacts caused by nature within and outside the boundaries of PAs are essential because they define the dynamics and create resources for the survival of organisms. This meant that areas with a minimal change dynamic are the smallest territories where these changes affect keeping constant balance.

According to [10] an allocated space should be no less than 50 times bigger than the largest area of natural impact to ensure the above-mentioned balance. These methods include ecosystem size alterations, with the suggestion for a minimal dynamic area, species’ inhabitancy impact and structure; changes in movement of materials and effects to inside and from outside areas of reserves; influences for important local residential areas, and seasonal migrated species population.

PAs are one of the key strategies employed by national and local powers to tackle anthropogenic factors leading to a decline in biodiversity with the aim of enhancing the safety of food and water re-

sources, promoting community’s resilience to address natural disasters and reduce the consequences of climate change [11]. Liu et al. [12], suggested that PAs help prevent the extinction of many threatened species and maintain a variety of ecosystem services around the world [5]. These ecosystem services contribute to the wellbeing of human societies. Additionally, PAs could deliver benefits for socioeconomic development, such as employment opportunities, recreational activities, tourism, and economic growth by supporting the livelihoods of local residents [13]. Thus, PAs are beneficial not only to nature but to human wellbeing because they provide vital ecosystem services [2]. For example, PAs with a well-managed system could provide clean water and food supplies and assist in the reduction of poverty [11].

PAs are also important in strengthening the sustainable development of regions and in integrating the sustainability principles in natural resource practices. The concept of sustainable development emerged after releasing the Brundtland Commission report ‘Our Common Future’ and is defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ [14]. However, it is often criticised as a utopian term due to the perceived impossibility of achieving ideal sustainable development [15].

However, despite the significant value of PAs, their effectiveness depends on their being well managed and well-planned [16]. PAs management effectiveness assessments have been used around the world to conduct appraisals of current PAs management systems and assist with the implementation of enhanced methods of preservation activities [17].

One of the issues to emerge from PAs management is keeping the balance between the socio-economic development of locals and the biodiversity preservation activities that could be a potentially complicated issue. Many important areas, in terms of providing a vital ecological function, are situated in less economically developed territories. Therefore, the prohibition on using its resources should also consider effective measures to compensating locals for a lack of income. These issues are crucial to an efficient PAs management [18].

### **Public attitudes and perceptions to protected areas**

The importance of the PAs as a successful conservation initiative requires acceptance and un-

derstanding by the local communities [19]. The achievement of the conservation objectives in PAs has been known to conflict with local residents' attitudes and needs [20]. Some of the main causes of this conflict are the access restrictions to PAs, which could be imposed on land use practices namely, agricultural practices, fisheries, hunting, and extraction of natural resources [21]. These are one of the reasons for the negative attitude of people to PAs, which could cause major challenges to effective biodiversity conservation.

Therefore, people's understanding and perspectives of PAs play a key role in planning sustainable preservation and acceptance of environmental policies [22].

The literature recommends that any possible evaluation should include people's attitudes, demands and choices concerning the quality of the environment to enhance the planning process [23, 24]. Having broad and essential information about local individuals' perception to PAs and their management is crucial because this knowledge could be used in the planning of environmental management and enhance the level of sustainable development. For example, the success of implementing the new policy regulation depends on whether participants are influenced by the preservation of biodiversity positively or negatively [25].

It is essential to consider the fact that perceptions can be established under the impact of various social aspects such as socio-economic and demographic factors as well as psychological components such as personal values, needs, or attribution of individuals. Environmentally orientated psychological research, conducted to investigate the connection between perception and behaviour, found that attitudes are vital in establishing eco-friendly behaviour [26]. Moreover, the social aspects of a person (age, gender, education) could affect residents' understanding and views about their relationship to the environment. It is in this way that their behavioural patterns towards nature have been established [27]. Another factor which can be influenced by the community's perception is the level of trust in the environmental organisations [28]. This understanding is important in achieving sustainable conservation objectives, and in the design and implementation of new environmental policies and for sustainable development [29].

### **Stakeholders' participation in the environmental management**

Until 1970, most countries around the world followed the 'preservation-oriented' approach, which

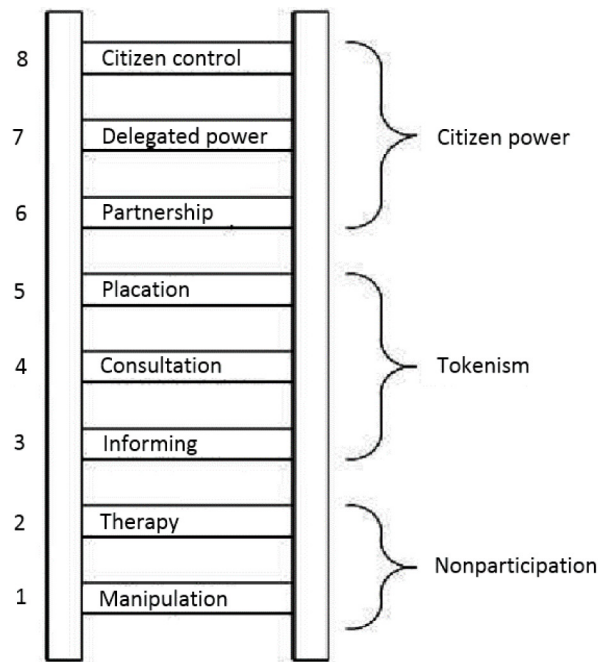
was based on centrally regulated control and excluded humans from management in order to protect biodiversity [30]. However, that traditional conservation strategy came in for criticism and were no longer considered as a viable solution due to the decreasing biodiverse population around the world. This approach has often generated human-wildlife conflicts caused by agricultural expansion, over-exploitation of natural resources, and poaching. In the 1970 – 80's, the rights of local residents and the needs of the environmental management system were more widely acknowledged and as a response to these concerns new participatory approach has been implemented [31].

Thus, in order to successfully manage conservation, greater stakeholders' participation was required in the environmental decision-making process [32]. Preservation activists claim that without the involvement of domestic societies in conservation activities, certain levels of protected areas cannot function successfully [33].

Participation in the environmental decision-making process is defined as 'a process where individuals, groups and, organisations choose to take an active role in making a decision that affects them' [34]. Arnstein [35] identified an 8-rung ladder of participation and non-participation (Figure 2).

The bottom levels are manipulation and therapy, which are described as 'non-participation' and are a replacement for a real participant. The real objective of this is not to provide people with a possibility of being part of the planning or controlling works of projects but instead to provide authorities with abilities to influence project participants to obtain results that they desired. The next rung is Tokenism, which includes informing, consultation and placation and allows participants to hear and be heard. However, this level limits participants' power to having their views only taken into account during the decision-making process. This level of power does not give enough power to the people to change a current situation. The final decision-making power rests with the authorities, allowing non-participates to make only suggestions. Rung (5) Placation can be defined as the highest level of tokenism. Further up the ladder are stages of residents' power with a rising level of possibilities to make the decision. According to Arnstein, citizens could move into a (6) Partnership level that allows them to obtain a consensus on arguable issues with authorities. At the top levels, Delegated Power (7) and Citizen Control (8) non-participants own the most of positions or even totally obtain the power to govern.





**Figure 2** – An 8-rung ladder of participation and non-participation in decision-making process [adapted from [35]]

There are different types of participation, namely normative and pragmatic. ‘Normative participation suggests that residents have a democratic right to be involved in the decision-making process’ [34]. The focus of the normative approach is pointed towards benefits for democracy in society. For instance, there is a claim that active participation of stakeholders in decision-making leads to minimizing possibilities of marginalisation of those on the periphery, in terms of having power to influence decisions. Therefore, the wider involvement of suitable stakeholders in the decision-making process could be beneficial in achieving the positive development of a sense of community.

Pragmatic participation could enhance the quality of the decisions about environmental issues that have been made with the involvement and interaction of a diverse interest group. This type of involvement allows the usage of various technologies to comply with domestic, cultural, and environmental situations. This could increase the effectiveness of acceptance among local focus groups, and their ability to address domestic demands and preferences [34].

Kooiman [36] underlines that multiple actors’ whose livelihoods are affected by the decision-making process should have a voice in the process. For example, in the case of wildlife conservation, local residents’ involvement and their ability to express

their views about maintaining preservation activities are critically essential in achieving meaningful and successful conservation [37]. This process leads to legitimacy and compliance to the management process. However, co-governance is not just managing resource; it is governing the stakeholders’ relationship [38].

Involvement in environmental decision-making is associated with the democratic right, enhancing the quality, durability and legitimacy of decisions, increasing the public trust, and generating a civil society [39]. Thus, the engagement of stakeholders in decision-making could demonstrate democracy, equity and procedural justice [34].

Moreover, Richard et al., [40] claim that participation of relevant stakeholders positively affects the fairness of environmental decisions because they are based on an acknowledgment of the complicated issues surrounding the relationship between people and the environment. It is claimed that the knowledge obtained by stakeholders from scientists through their participation increases their abilities to use this knowledge and so justifies stakeholders’ participation [41]. Social learning also can be promoted in this way [42] and public trust could be increased through the stakeholders’ engagement in the decision-making process [40].

The importance of stakeholders’ participation in the environmental decision-making process indicat-

ed that theoretical expectations could be challenging in practice.

This approach does not focus on reducing poverty or the empowerment of the marginalised. Rather, stakeholders' involvement leads to strengthening of a local elite and the exclusion of marginal actors, who are deprived and politically weaker, and this could have negative consequences for the sense of justice and well-being in communities [43].

Additionally, the successful stakeholders' participation depends on involving participants whose influence could be problematic to detect. This is known as the 'tyranny of participation'. Although there are positive purposes of these so-called 'participatory' methods, they may not always provide the expected response and might be a legitimizing tool for the current situation [44]. Many of those who have experience of this describe a feeling of being part of a staged act with the sole purpose of legitimising already decided decisions. Others stated that it takes place only to present the event as democratic procedure and organisers of this do not want to take sole responsibility for a decision.

### ***Climate change***

PAs face significant challenges that limit their ability to meet the growing demands to completely deliver all benefits and values. One of the new pressures for biodiversity conservation is climate change. It is considered a major obstacle to species preservation with serious long-term implications, which could force biodiversity loss in the future [45].

According to the International Panel Climate Change, climate change models in Central Asia suggested that there is decreasing precipitation in the summer period but it is increasing in winter [46]. The impact of changes in weather conditions, especially temperature extremes and increased droughts, are viewed as the main threat to steppe biodiversity in Kazakhstan [47]. For instance, climate change increases pressure on the life of the *Saiga (tatarica)* population. In 2015, as result of a mass mortality, during a 3-week period over 200 000 (80%) Saiga antelope died in Central Kazakhstan caused by *Pasteurella Multocida* bacteria. The amount that died are an estimated 60% of the global population of Saiga [48-50]. Kock et al.'s (2018) study reported that this could have been caused by climate change due to the summer in this year being unusually warm and humid because of wetland evaporation [48]. These factors trigger a rise in infection and cause the mass mortality of the Saiga population in Kazakhstan.

It is necessary to estimate the risk of climate change on biodiversity by environmentalists. Often despite the fact that climate change issues considered at a higher national scale, on the regional level, it might be ignored or there is a lack of awareness among PA managers on adaptation, and/or mitigation strategies. These could have serious implications on the biodiversity preservation and sustainable development in the long-term, for example, increased species extinction, spread in wildlife disease, an increase in non-native species, and habitat loss [51].

Thus, understanding how the PA will respond to future climate change requires to be incorporated into management and planning strategies to promote ecosystem resilience [52]. These strategies are categorised into 4 groups; 'land and water protection, direct species management, monitoring and planning, law and policy' [51]. However, every PA should develop their own strategies due to each individual circumstances requiring specific solutions.

### ***Unsustainable practices***

Pressure from human activities is one of the most frequent challenges to species preservation. Developing countries are faced with the overexploitation of natural resources such as fishing, due to the reliance of local communities on these for income. Over-exploitation of natural resources within and around PAs (fishing, land-use change, agricultural practices, poaching and unsustainable hunting) put pressure on biodiversity and ecosystem function. This could alter the ecological functioning of PAs and have an effect on biodiversity loss [12, 53].

These threats challenge the integrity and stability of the ecosystem and biodiversity conservation. For example, poachers for their meat and valuable horns targeted Saiga Antelopes (*Saiga tatarica*). They are widely used for medical purposes in China and are consequently a significant source of income [54]. For instance, some studies identified that intense poaching pressure on endangered species such as Saiga Antelopes and Brine Shrimp (*Artemia*) are the highest threats to biodiversity conservation in the Korgalzhyn state natural reserve in Kazakhstan [47,50,54,55 ].

Many researchers consider poaching and unsustainable hunting to be an even greater threat to biodiversity particularly threatened species and influencing mammal species extinction. This is serious conservation issue around the world [56,57,58,59]. One of the main reasons for poaching can be commercial and another is obtaining a hunting trophy.

This is supported by Muth and Bowe, (1998) and Meduna et al., (2009) who state that trophy poaching is one of the motivations for poaching [60,61]. In many cases, overexploitation of biological resources is directly linked to the poverty and socio-economic situation [62]. The lack of employment opportunities in countryside areas trigger the poaching of the Saiga because it is both a source of income and food. On the other hand, hunting has a long history in human development and in many countries; it is valued as a cultural tradition. Therefore, it could be controversial to eliminate hunting. To this end, probably increasing the amount of fines for poaching, reducing quotas for hunting and more effective awareness campaigns about sustainable hunting management might reduce the hunting rate.

Another challenge to conservation in PAs is fish overexploitation outside safe biological limits for commercial purposes. Reduction of fish stock often makes their recovery difficult. This alters the ecosystem function and has negative implications [63, 64].

It is challenging to prevent the unsustainable use of natural resources by locals in low economic development areas where employment opportunities are limited. Linkie et al., (2003) found that poverty triggers the development of illegal activities to nature [59]. Without a change in poverty reduction strategies, 'biological diversity will pay the price for development yet again, and the human subsidy from nature will tax biodiversity to death' [65].

Therefore, enhancement of the region's economy and the preservation of biodiversity are two distinct objectives and could be achieved with two separate approaches but there is a link in practice. It means that these problems should be solved together with an integrated approach to natural resource management based on environmental, social and scientific disciplines [66]. In this regard, Steinmets et al., (2014) identified the key components as raising awareness, offer opportunities for action, and generate social pressure against poaching [67]. Such an approach has proved effective, reducing poaching by 88% in the Kuiburi National Park, Thailand. It is believed that implementation of these measures could be the initial stages in combatting the unsustainable exploitation of natural resources in PAs but a more complex solution seems to be required to tackle these issues.

### **Development of tourism**

Promoting tourism brings benefits by stimulating the local economy and providing employment

opportunities and without harming nature. This is supported by studies [68, 25], which state that tourism significantly contributed to the development of the local economy and alleviated poverty.

However, uncontrolled tourism have negative consequences for the PA's biodiversity, ecosystem function and the environment. The limited awareness of tourists and their subsequent irresponsible behaviour are the main reasons for environmental degradation [69].

Studies show that growing demand for nature-based tourism has risen the number of tourists whilst at the same time has had adverse ecological implications and caused enormous stress to biodiversity [70, 23, 58]. For example, Müllner et al., (2004) found that birds in Cuyabeno Wildlife Reserve were sensitive to tourist presence and 'even just watching animals during breeding can threaten their survival' [71]. Additionally, according to [72], unprotected parts of PAs delivered less ecosystem services due to rural abandonment and development of tourism.

Another issue is that only some local elite's benefit from tourism development whereas the local community is left with the degradation of the environment caused by tourism development. Timothy (2002) observed that the local communities do not have an equal opportunity to participate in tourism development due to their limited skills, knowledge and financial start-up capital [73]. Therefore, tourism can produce 'a false sense of security' [74] and should be considered as 'low horizons for development' [75]. These needs to be taken into account by reserve managers and sustainable tourism management approaches should be promoted, and the legal framework to deal with such threats should be established.

### **Conclusion**

The presented desk-based review highlights the complexity of challenges in PA's management. Despite being recognized as an effective instrument of environment conservation, PAs require consideration of local social, cultural and economic aspects in terms of its management:

- It is essential to consider the fact that perceptions can be established under the impact of various social aspects such as socio-economic and demographic factors as well as psychological components such as personal values, needs, or attribution of individuals.
- Ensuring rights of stakeholders, i.e. legitimization of the process of stakeholder involvement



in the decision-making process is one of the key issues of PA's management. Developing efficient mechanisms of these procedures could be a viable solution of the issue. Innovative management approaches, advancement of current skills and new working procedures are needed to insert methods of participation into existing institutional framework.

- Uncontrolled human activities significantly affect PAs. Management should take actions to avoid degradation of ecosystem function in core areas. This needs to be taken into account by conservation managers during the development of the management plan for further sustainable development and effective biodiversity conservation. Therefore, legislation enforcement, strict penalisation, and increasing awareness from childhood thereby giving locals time to change their low cultural mentality in

a positive way to value nature – all could be required to deal with negative human pressures.

- The threat of climate change in many cases are overlooked in the PA's management plan. Identification of serious issues to biodiversity conservation such as climate might drive PAs to provide important insights where the risk might have previously been ignored. It is essential to prevent the threat to biodiversity and provide sustainable development in an era of climate change.

- Local authorities must be required to promote sustainable tourism and to develop the region to improve the socio-economic situation without compromising conservation. Providing environmental education for tourists to change their behaviour and development of a policy framework for sustainable tourism, may improve the situation.

### References

1. Millennium Ecosystem Assessment, Ecosystem and human well-being: biodiversity synthesis. World Resources Institute, Washington, DC. 2005.
2. Juffe-Bignoli D., Burgess N.D., Bingham H., Belle E.M.S., de Lima M.G., Deguignet, M., Bertzky B., Milam A.N., Martinez-Lopez, J., Lewis, E., Eassom, A., Wicander, S., Geldmann, J., van Soesbergen, A., Arnell, A.P., O'Connor, B., Park, S., Shi, Y.N., Danks, F.S., MacSharry, B., Kingston, N., 2014. *Protected Planet Report*. UNEP-WCMC: Cambridge, UK [online] Available at: [https://www.unepwcmc.org/system/dataset\\_file\\_fields/files/000/000/289/original/Protected\\_Planet\\_Report\\_2014\\_01122014\\_EN\\_web.pdf?1420549522](https://www.unepwcmc.org/system/dataset_file_fields/files/000/000/289/original/Protected_Planet_Report_2014_01122014_EN_web.pdf?1420549522) [Accessed 16 Jul. 2022].
3. Butchart S.H., Walpole M., Collen, B., Van Strien, A., Scharlemann, J.P., Almond, R.E., Baillie, J.E., Bomhard, B., Brown, C., Bruno, J. and Carpenter, K.E., Global biodiversity: indicators of recent declines. *Science*, (2010):1187512.
4. Cbd.int. Convention on Biological Diversity (n.d.). *National financing: Asia-Pacific*. [Online] Available at: <https://www.cbd.int/financial/nf-asia.shtml> [Accessed 7 Oct. 2022].
5. Dudley, N. ed., *Guidelines for applying protected area management categories*. 2008.
6. Chape, S., Harrison, J., Spalding, M. and Lysenko, I., Measuring the extent and effectiveness of protected areas as an indicator for meeting global biodiversity targets. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 360(1454), (2005):443-455.
7. Rotich, D., 2012. Concept of zoning management in protected areas. *Journal of Environment and Earth Science*, 2(10), (2009):173-183.
8. Hansen, A.J. and DeFries, R., 2007. Ecological mechanisms linking protected areas to surrounding lands. *Ecological Applications*, 17(4), pp.974-988.
9. Pickett, S.T. and Thompson, J.N., 1978. Patch dynamics and the design of nature reserves. *Biological conservation*, 13(1), pp.27-37.
10. Baker, W.L., 1992. The landscape ecology of large disturbances in the design and management of nature reserves. *Landscape ecology*, 7(3), pp.181-194.
11. Worboys, G., Lockwood, M. and De Lacy, T., *Protected area management: Principles and practice* (2005): 432-463). Melbourne: Oxford University Press.
12. Liu, J., Linderman, M., Ouyang, Z., An, L., Yang, J. and Zhang, H., Ecological degradation in protected areas: the case of Wolong Nature Reserve for giant pandas. *Science*, 292(5514), (2001):98-101.
13. He, G., Chen, X., Liu, W., Bearer, S., Zhou, S., Cheng, L.Y., Zhang, H., Ouyang, Z. and Liu, J., Distribution of economic benefits from ecotourism: a case study of Wolong Nature Reserve for Giant Pandas in China. *Environmental Management*, 42(6), (2008):1017.
14. World Commission on Environmental and Development *Our Common future (Australian Edn)*. Melbourne: Oxford University Press. (1987).
15. Robson, J. and Robson, I From shareholders to stakeholders: Critical issues for tourism marketers. *Tourism Management* 17 (7) 533-40.MA). (1996)
16. Worboys, G.L., Lockwood, M., Kothari, A., Feary, S. and Pulsford, I. eds., *Protected area governance and management*. ANU Press. 2015.
17. Leverington, F., Costa, K.L., Pavese, H., Lisle, A. and Hockings, M., A global analysis of protected area management effectiveness. *Environmental management*, 46(5), (2010):685-698.

18. Bennett, N.J. and Dearden, P., Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand. *Marine Policy*, 44, (2014):107-116.
19. Ciocănea, C.M., Sorescu, C., Ianoși, M. and Bagrinovschi, V., Assessing public perception on protected areas in Iron Gates Natural Park. *Procedia Environmental Sciences*, 32, (2016):70-79.
20. Bartlett, C.Y., Maltali, T., Petro, G. and Valentine, P., Policy implications of protected area discourse in the Pacific islands. *Marine Policy*, 34(1), (2010):99-104.
21. Treves, A., Wallace, R.B., Naughton-Treves, L. and Morales, A., Co-managing human-wildlife conflicts: a review. *Human Dimensions of Wildlife*, 11(6), (2006):383-396.
22. Faasen, H. and Watts, S., Local community reaction to the 'no-take' policy on fishing in the Tsitsikamma National Park, South Africa. *Ecological Economics*, 64(1), (2007):36-46.
23. Cihar, M. and Stankova, J., Attitudes of stakeholders towards the Podyji/Thaya river basin national park in the Czech Republic. *Journal of Environmental Management*, 81(3), (2006):273-285.
24. Priskin, J., Tourist perceptions of degradation caused by coastal nature-based recreation. *Environmental Management*, 32(2), (2003):189-204.
25. Walpole, M.J., Goodwin, H.J. and Ward, K.G., Pricing policy for tourism in protected areas: lessons from Komodo National Park, Indonesia. *Conservation Biology*, 15(1), (2001):218-227.
26. Glasman, L.R. and Albarracín, D., Forming attitudes that predict future behavior: A meta-analysis of the attitude-behavior relation. *Psychological bulletin*, 132(5), (2006):778.
27. Dunlap, R.E., Van Liere, K.D., Mertig, A.G. and Jones, R.E., New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, 56(3), (2000):425-442.
28. Borrini-Feyerabend, G., 24 Collaborative Management of protected areas. *Partnerships for protection: New strategies for planning and management for protected areas*, (1999):224.
29. Weladji, R.B., Moe, S.R. and Vedeld, P., Stakeholder attitudes towards wildlife policy and the Benoue Wildlife Conservation area, North Cameroon. *Environmental conservation*, 30(4), (2003):334-343.
30. Mehta, J.N. and Kellert, S.R., Local attitudes toward community-based conservation policy and programmes in Nepal: a case study in the Makalu-Barun Conservation Area. *Environmental Conservation*, 25(4), (1998):320-333.
31. Coad, L., Campbell, A., Miles, L. and Humphries, K., The costs and benefits of protected areas for local livelihoods: a review of the current literature. *UNEP World Conservation Monitoring Centre, Cambridge, UK* 2008.
32. Stringer, L.C., Reed, M.S., Dougill, A.J., Rokitzki, M. and Seely, M., Enhancing participation in the implementation of the United Nations Convention to Combat Desertification. In *Natural Resources Forum* (Vol. 31, (2007)198-211).
33. Xu, J., Chen, L., Lu, Y. and Fu, B., Local people's perceptions as decision support for protected area management in Wolong Biosphere Reserve, China. *Journal of Environmental Management*, 78(4), (2006):362-372.
34. Reed, M.S., Stakeholder participation for environmental management: a literature review. *Biological conservation*, 141(10), (2008):2417-2431.
35. Arnstein, S.R., A ladder of citizen participation. *Journal of the American Institute of planners*, 35(4), (1969):216-224.
36. Kooiman, J., *Governing as governance*. Sage. 2003.
37. Blackstock, K.L., Kelly, G.J. and Horsey, B.L., Developing and applying a framework to evaluate participatory research for sustainability. *Ecological economics*, 60(4), (2007):726-742.
38. Natcher, D.C., Davis, S. and Hickey, C.G., Co-management: managing relationships, not resources. *Human Organization*, (2005):240-250.
39. Krause, T. and Nielsen, T.D., The legitimacy of incentive-based conservation and a critical account of social safeguards. *Environmental Science & Policy*, 41, (2014):44-51.
40. Richards, C., Carter, C. and Sherlock, K., *Practical approaches to participation*. Aberdeen: Macaulay Institute. 2004.
41. Bulkeley, H. and Mol, A.P., Participation and environmental governance: consensus, ambivalence and debate. *Environmental Values*, (2003):143-154.
42. Bogaert, D., Cliquet, A. and Maes, F., Designation of marine protected areas in Belgium: A legal and ecological success? *Marine Policy*, 33(6), (2009):878-886.
43. Young, J.C., Jordan, A., Searle, K.R., Butler, A., Chapman, D.S., Simmons, P. and Watt, A.D., Does stakeholder involvement really benefit biodiversity conservation? *Biological Conservation*, 158, (2013):359-370.
44. Cooke, B. and Kothari, U. eds., *Participation: The new tyranny?*. Zed books. 2001.
45. Thomas, C.D., Cameron, A., Green, R.E., Bakkenes, M., Beaumont, L.J., Collingham, Y.C., Erasmus, B.F., De Siqueira, M.F., Grainger, A., Hannah, L. and Hughes, L., 2004. Extinction risk from climate change. *Nature*, 427(6970), p.145.
46. I.P.O.C., 2007. Report of the nineteenth session of the intergovernmental panel on climate change (IPCC) Geneva, 17-20 (am only) April 2002.
47. Kamp, J., Koshkin, M.A., Bragina, T.M., Katzner, T.E., Milner-Gulland, E.J., Schreiber, D., Sheldon, R., Shmalenko, A., Smelansky, I., Terraube, J. and Urazaliev, R., 2016. Persistent and novel threats to the biodiversity of Kazakhstan's steppes and semi-deserts. *Biodiversity and conservation*, 25(12), pp.2521-2541.
48. Kock, R.A., Orynbayev, M., Robinson, S., Zuther, S., Singh, N.J., Beauvais, W., Morgan, E.R., Kerimbayev, A., Khomenko, S., Martineau, H.M. and Rystaeva, R., 2018. Saigas on the brink: Multidisciplinary analysis of the factors influencing mass mortality events. *Science advances*, 4(1), p.eaao2314.

49. Saiga Conservation Alliance. (2018). *Scientists uncover secret of mass mortality event in remote steppe grassland of Central Asia – Saiga Conservation Alliance*. [online] Available at: <http://saiga-conservation.org/2018/01/17/scientists-uncover-secret-mass-mortality-event-remote-steppe-grassland-central-asia/> [Accessed 31 Jul. 2022].
50. Milner-Gulland, E. J. "Catastrophe and hope for the saiga." *Oryx* 49, no. 4 (2015): 577.
51. Mawdsley, J.R., O'malley, R. and Ojima, D.S., 2009. A review of climate-change adaptation strategies for wildlife management and biodiversity conservation. *Conservation Biology*, 23(5), pp.1080-1089.
52. Dawson, T.P., Jackson, S.T., House, J.I., Prentice, I.C. and Mace, G.M., 2011. Beyond predictions: biodiversity conservation in a changing climate. *Science*, 332(6025), pp.53-58.
53. Schulze, K., Knights, K., Coad, L., Geldmann, J., Leverington, F., Eassom, A., Marr, M., Butchart, S.H., Hockings, M. and Burgess, N.D., 2018. An assessment of threats to terrestrial protected areas. *Conservation Letters*, p.e12435.
54. Bekenov, A.B., Blank, D.A., Grachev, Y.A. and Plakhov, K.N., 2001. . Kazakhstan. *Antelopes. Part 4: North Africa, the Middle East, and Asia. Global Survey and Regional Action Plans*, p.134.
55. UNDP. (2016). *Saving the Saiga by United Nations Development Programme on Exposure*. [online] Available at: <https://stories.undp.org/saving-the-saiga> [Accessed 8 Aug. 2022].
56. Ormsby, A. and Mannle, K., 2006. Ecotourism benefits and the role of local guides at Masoala National Park, Madagascar. *Journal of Sustainable Tourism*, 14(3), pp.271-287.
57. Robinson, S. and Milner-Gulland, E.J., 2003. Political change and factors limiting numbers of wild and domestic ungulates in Kazakhstan. *Human Ecology*, 31(1), pp.87-110.
58. Okello, M.M. and Kiringe, J.W., 2004. Threats to biodiversity and their implications in protected and adjacent dispersal areas of Kenya. *Journal of Sustainable Tourism*, 12(1), pp.55-69.
59. Linkie, M., Martyr, D.J., Holden, J., Yanuar, A., Hartana, A.T., Sugardjito, J. and Leader-Williams, N., 2003. Habitat destruction and poaching threaten the Sumatran tiger in Kerinci Seblat National Park, Sumatra. *Oryx*, 37(1), pp.41-48.
60. Muth, R.M. and Bowe Jr, J.F., 1998. Illegal harvest of renewable natural resources in North America: Toward a typology of the motivations for poaching. *Society & Natural Resources*, 11(1), pp.9-24.
61. Meduna, A.J., Ogunjinmi, A.A. and Onadeko, S.A., 2009. Biodiversity conservation problems and their implications on ecotourism in Kainji Lake National Park, Nigeria. *Journal of Sustainable Development in Africa*, 10(4), pp.59-73.
62. Kühl, A., Balinova, N., Bykova, E., Arylov, Y.N., Esipov, A., Lushchekina, A.A. and Milner-Gulland, E.J., 2009. The role of saiga poaching in rural communities: linkages between attitudes, socio-economic circumstances and behaviour. *Biological Conservation*, 142(7), pp.1442-1449.
63. Nath, B. and Deka, C., 2012. A study on fish diversity, conservation status and anthropogenic stress of Chandubi tectonic lake, Assam, India. *J. Bio. Innov*, 1(6), pp.148-155.
64. Paterson, J.A. and Chapman, L.J., 2009. Fishing down and fishing hard: ecological change in the Nile perch of Lake Nabugabo, Uganda. *Ecology of Freshwater Fish*, 18(3), pp.380-394.
65. Sanderson, S.E. and Redford, K.H., 2003. Contested relationships between biodiversity conservation and poverty alleviation. *Oryx*, 37(4), pp.389-390.
66. Adams, W.M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J., Roe, D., Vira, B. and Wolmer, W., 2004. Biodiversity conservation and the eradication of poverty. *Science*, 306(5699), pp.1146-1149.
67. Steinmetz, R., Srirattapanorn, S., Mor□Tip, J. and Seuaturien, N., 2014. Can community outreach alleviate poaching pressure and recover wildlife in South□East Asian protected areas?. *Journal of Applied Ecology*, 51(6), pp.1469-1478.
68. Walpole, M.J. and Goodwin, H.J., 2000. Local economic impacts of dragon tourism in Indonesia. *Annals of tourism research*, 27(3), pp.559-576.
69. Ceballos-Lascurain, H., 1996. *Tourism, ecotourism, and protected areas: The state of nature-based tourism around the world and guidelines for its development*. Iucn.
70. Newsome, D., Moore, S.A. and Dowling, R.K., 2012. *Natural area tourism: Ecology, impacts and management* (Vol. 58). Channel view publications.
71. Müllner, A., Linsenmair, K.E. and Wikelski, M., 2004. Exposure to ecotourism reduces survival and affects stress response in hoatzin chicks (*Opisthocomus hoazin*). *Biological Conservation*, 118(4), pp.549-558.
72. García-Llorente, M., Martín-López, B., Iniesta-Arandia, I., López-Santiago, C.A., Aguilera, P.A. and Montes, C., 2012. The role of multi-functionality in social preferences toward semi-arid rural landscapes: an ecosystem service approach. *Environmental Science & Policy*, 19, pp.136-146.
73. Timothy, D.J., 2002. Tourism and community development issues. *Tourism and development: Concepts and issues*, pp.149-164.
74. Isaacs, J.C., 2000. The limited potential of ecotourism to contribute to wildlife conservation. *Wildlife Society Bulletin*, 28(1), pp.61-69.
75. Butcher, J., 2005. The moral authority of ecotourism: A critique. *Current Issues in Tourism*, 8(2-3), pp.114-124.