

ENVIRONMENTAL MANAGEMENT CHALLENGES IN THE 21ST CENTURY: ASSESSMENT OF PROTECTED AREAS MANAGEMENT EFFECTIVENESS IN SLOVAKIA

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Abstract. The paper presents an assessment of current activities in the management of two Slovak National Parks in the context of sustainable development dimensions and principles and the life cycle of the fields of activity (FoAs). Our results show footprints of National Park (NP) Poloniny and NP Nízke Tatry (NAPANT) management from the holistic point of view of sustainable development in the 21st century. The assessment indicates that the sustainable development dimensions and principles have not yet been systematically integrated into the management of both evaluated Protected areas (PAs), and there is urgent need to increase the management complexity at FoA level, especially in the planning and networking phases, as an aggregate parameter of the new challenges and related requirements for planning, implementing and managing PAs in the new Millennium. Common features were identified in both evaluated PAs that appear to indicate the necessity for changes in the institutional set-up governing PA management which are, however, not within the power of individual park managers; all these features have, as a backdrop, a marked resistance to change in environmental policy at the national government level in the context of PA management. From the results, authors also draw the conclusion that Integrated Management of PAs (IPAM toolbox) promises to be a valuable instrument in the arsenal of the national institutions tasked with protected area management, enabling them to cope with and achieve satisfactory adaptation to the varying environmental and social factors which characterise the 21st century and thus reach their desired aim in terms of a more efficient and effective park management system.

Keywords: Poloniny, NAPANT, life cycle assessment, protected area.

AIMS AND BACKGROUND

The concept of protected area management in the 21st century stems from the need to adopt a coherent set of five dimensions of sustainable development (the ecologi-

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cal, economical, social, and cultural dimensions as well as that of safety) that are spatially and functionally connected, while creating and sharing benefits. Lange and Jungmeier¹ have pointed out that the technological revolution, demographic trends and new forms of knowledge work are the key points of fundamental social change and shift perspectives. Ongoing change in the current society has significant impact on nature protection in general, and on the management of protected areas in particular². Jungmeier³ has identified a new generation of PAs (a 'third generation' of PAs) with the most important elements being the new mechanisms of governing and also a new understanding of the socio-sphere within the eco-sphere through an increasing number of scientific disciplines in sustainable development management. PA management must adapt to changes in society goals and preferences and adapt to rapid changes. Tools for assessing the management of protected areas are important in managing such changes⁴. Well-designed and well-managed protected areas are our most effective tools for conserving nature, and provide a wide range of ecological, economic, social, cultural and spiritual benefits. Proper management of PAs in the 21st century requires new ways of thinking, innovative methods and new systems of finance and governance to meet the needs of the current third-generation PAs and of future generations of PAs (Refs 3 and 4). It is not possible to achieve Sustainable development (SD) of PAs in present times without increasing co-operation with local communities and stakeholders by helping to develop their understanding of main dimensions, principles and fields of activity of integrative management in the context of the fair balanced development in all dimensions^{3,5,6}.

The specific objectives of this study based on the assessment of current activities in protected area management in Slovakia were: (i) to evaluate the footprints of PA management through the concept of sustainable development dimensions and formed principles; (ii) to range 29 fields of activity (FoAs) following the PA life cycle (pre-phase, planning phase, implementation phase and networking), and (iii) to investigate the effectiveness of integrated management in the two Slovak national parks (one of the most recent and one of the oldest, respectively).

EXPERIMENTAL

The study was conducted from May 2016 to September 2017 in two Slovak national parks.

Poloniny National Park is a trilateral biosphere reservation (Slovak-Polish-Ukrainian), located in northeastern Slovakia and situated in the Bukovské vrchy which are listed as a UNESCO world heritage site. It is one of the most recent national parks in Slovakia, having been established only in 1997, with a protected area of 298.05 km² and a 109.73 km² buffer zone⁷.

National Park Nízke Tatry (NAPANT) is situated in Central Slovakia established in 1978. It is the largest National Park in Slovakia with a protected area

of 728 km² and a buffer zone of 1102 km². It contains the largest cave system in Slovakia (the system of Demänovské caves), which extends for more than 41 km, and also the deepest cave system (Hipmanské jaskyne (Hipman Caves): Starý hrad (Old Castle) – Večná robota (Eternal Work), whose depth is 495 m⁷.

Using the methodology of Integrative protected area management (IPAM toolbox), we have been evaluating the ‘life cycle’ of each selected PA according to five principal dimensions (Fig. 1), ten key principles of sustainable development (Fig. 2) and 29 related FoAs within the five phases (Pre-phase, Basic Planning, Detailed Planning, Implementation and Networking) of IPAM (Refs 1, 3, 8 and 9).

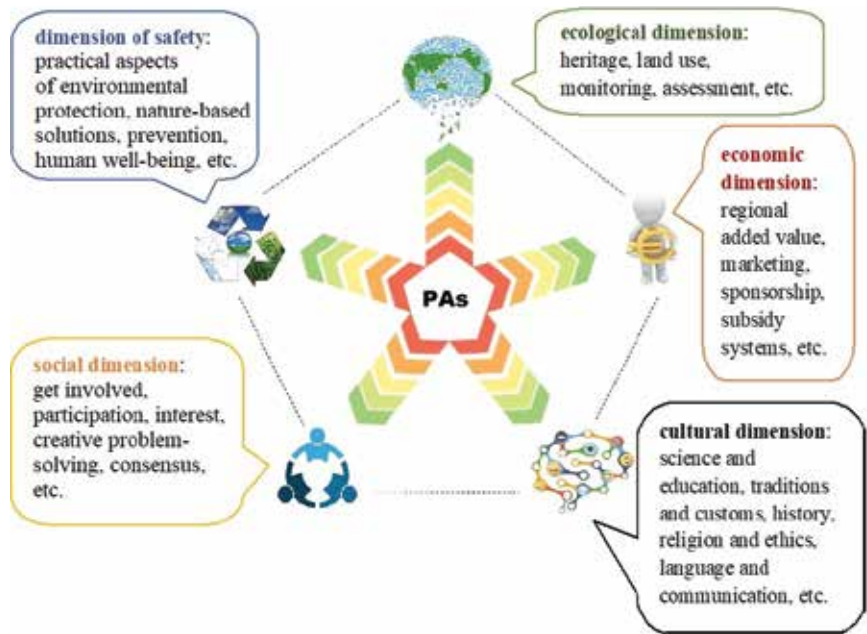


Fig. 1. Five dimensions model of sustainable development



Fig. 2. Ten principles of sustainable development (Source: Jungmeier⁶)

RESULTS AND DISCUSSION

Profile by sustainable development dimensions. We analysed five dimensions in protected area management, which include a wide portfolio of scientific disciplines. The main topics were conservation of nature and landscape, good governance, cultural heritage management, system analysis and monitoring, environmental economics and knowledge management. The results show (Figs 3 and 4) that the footprint of each involved dimension is not balanced properly in the context of the complexity of protected area management in the 21st century. The weaknesses of management are visible in the economic and the social dimension in both evaluated PAs, and could lead to a particular complex of problems (lack of subsidiary financial sources to support PA management, low level of regional added value, low level of stakeholder participation and interest). There is an urgent need to improve knowledge management as the main part of the cultural dimension in the National Park Poloniny.

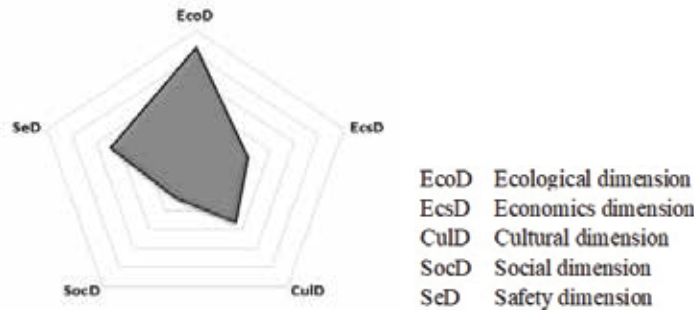


Fig. 3. Footprints of NP Poloniny management by sustainable development dimensions

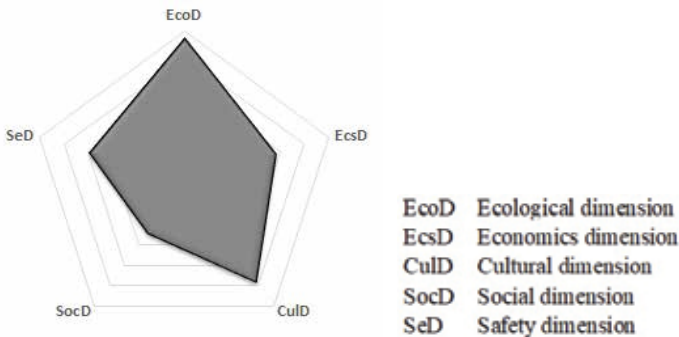


Fig. 4. Footprints of NAPANT management by sustainable development dimensions

The benefits of the balanced integration of each dimension consist mainly in creating consistency and harmonising/optimising procedures, eliminating conflicts and risks, formalising informal systems, reducing duplication of effort and hence

cost, increasing potential benefits, improving control and monitoring, and facilitating further education and awareness⁹.

Profile by sustainable development principles. Figures 5 and 6 show the differentiated relevance of implementation of individual principles of sustainable development in both assessed PAs. The more management is focused on implementing just one or two principles, the more difficult it is to achieve SD (Fig. 5). Based on the results, we can identify the common absence of sufficient implementation of benefit-sharing and knowledge management in both evaluated PAs, which deficiency is beyond the control of individual park managers. In this context, it is necessary to appeal for the required institutional changes in good governance at the government level. Some authors^{1,3,4,10,11} have also proved that there is a very close link between sustainable development and good governance.

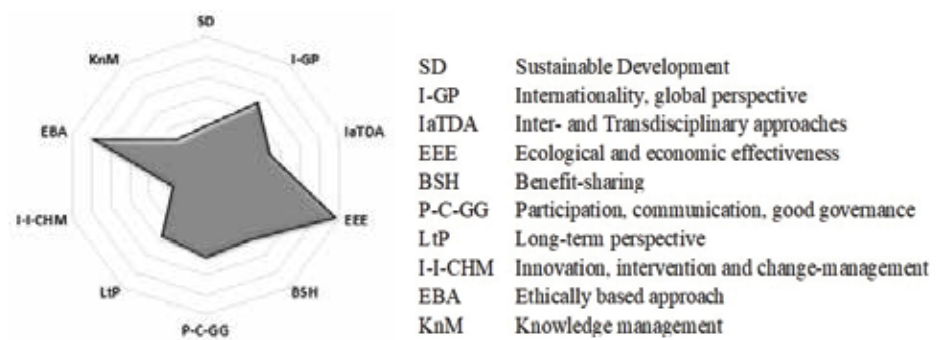


Fig. 5. Footprints of NP Poloniny management by sustainable development principles

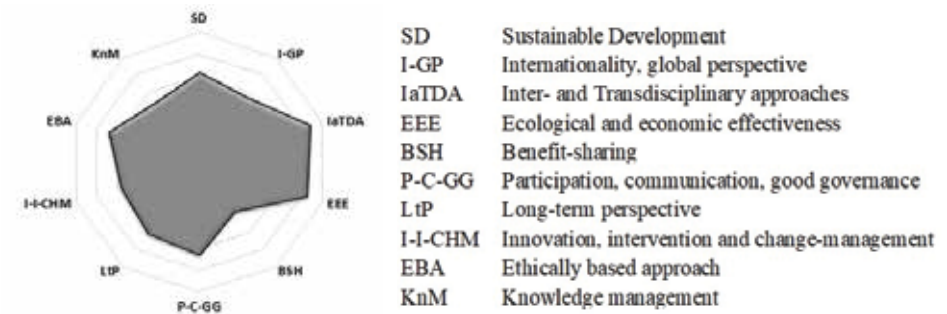


Fig. 6. Footprints of NAPANT management by sustainable development principles

Detailed analysis by life cycle assessment. The detailed analysis and evaluation of the FoAs throughout the life cycle of both PAs (Figs 7 and 8) indicates that many cross-cutting topics are underestimated in management. The greatest weaknesses were noted in the context of planning and networking (involvement in the economic (FoA-27) and social network (FoA-28)).

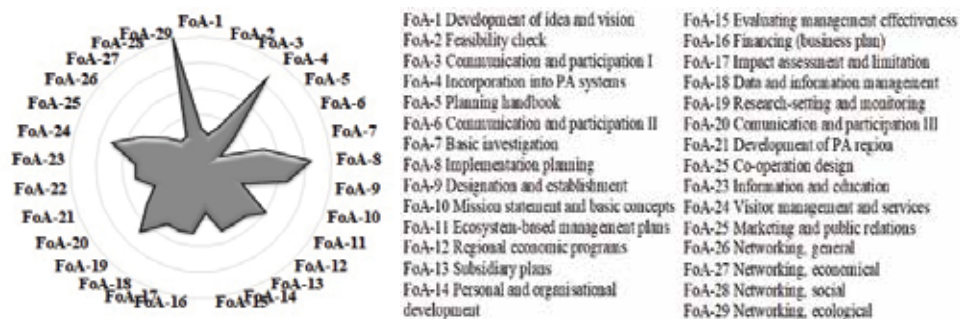


Fig. 7. Detailed assessment of each field of activity (FoA) in the life cycle of NP Poloniny

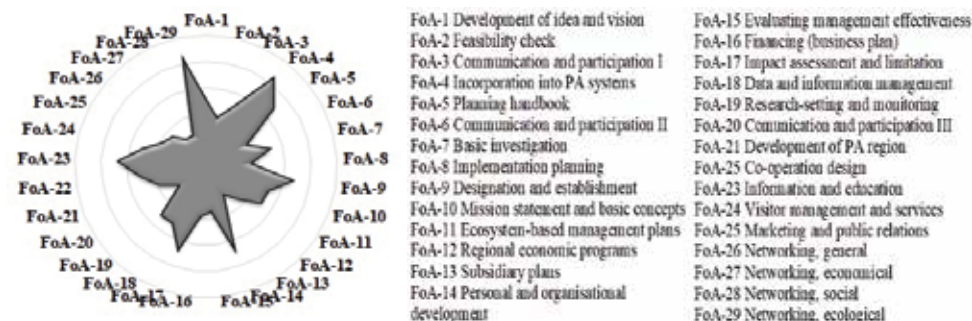


Fig. 8. Detailed assessment of each field of activity in life cycle of NAPANT

The challenges and paradigm changes in nature and landscape protection have been described for the first time by Weixlbaumer¹². PAs management in the new millennium must focus on the optimal development of all five dimensions, ten sustainable development principles and 29 FoAs in the governance process. In addition to ensuring the highest possible protection of biodiversity and ecosystem services (ES), they must also take into account the environmental impact of individual activities, providing quality products and services to visitors, ensuring a safe environment and maximising the use of available resources. Well-integrated management systems will also help PAs manage complexity in connection with many other aspects that could be important for a holistic protected area management strategy^{2-5,13-17}. Jungmeier³ and Figgis et al.¹⁰ state that nowadays sustainable development can not be achieved without the appropriate means and mechanisms for empowering and involving stakeholders and encouraging them to maintain a responsible attitude in integrated protected area management.

CONCLUSIONS

Research has confirmed that IPAM can help managers in the challenging role of PA management, especially in identifying specific areas of activity (FoA) that need

to be revised, along with defining priorities. IPAM divides PA management into life cycles and, in a logical sequence, defines specific areas of activity, allowing managers to get a detailed overview of current management efficiency and helping to take into account the priorities of each attribute to focus on achieving higher management efficiency. In our study we found that the IPAM toolbox promises to be a valuable instrument in the arsenal of the national institutions tasked with protected area management, enabling them to cope with and achieve satisfactory adaptation to the varying environmental and social factors which characterise the 21st century, and thus reach their desired aim in terms of a more efficient and effective park management.

According to our results, the main conclusions are as follows:

(i) the sustainable development dimensions and principles have not yet been systematically integrated into the management of both evaluated PAs; (ii) it is necessary to increase the management complexity at FoA level, especially in the planning phase and networking, as an aggregate parameter of the new challenges and related requirements for planning, implementing and managing PAs in the 21st century; (iii) common characteristics of both evaluated PAs were identified that appear to indicate the necessity for changes in the institutional set-up governing PA management which are, however, not within the power of individual park managers and relate to resistance to change in environmental policy at the national government level in the context of PA management.

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