

Assessment of environmental education indicators in Triglav National Park, Slovenia

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Abstract

We present the analysis of a list of 89 environmental education indicators grouped in 14 dimensions for the assessment of the priorities in implementing environmental education in protected areas, Triglav National Park (TNP), Slovenia, in particular. The list of environmental education indicators is based on a thorough review of the TNP publication (Triglav National Park annual report 2008-2009) and TNP web page. The indicators have been evaluated in terms of their importance and measurability by eight TNP managers, directly and indirectly involved in the implementation of environmental education in the park. The importance of the indicators has been measured on a three-folded scale as: *essential* (3), *desirable* (2), *not significant* (1). Managers used measurability parameter to indicate for which indicators data are being collected in TNP and which indicators are already being in use in TNP, according to their experience. The results indicate that all 89 suggested indicators are at least desirable. Out of 89 environmental education indicators the analysis revealed 7 essential environmental education indicators, 5 evaluating direct environmental education in the park and 2 evaluating European funding sources. A comparison of the 4 essential indicators according to data from the years 2000 and 2009 has been performed showing a significant increase in environmental education activities in TNP over the years, i.e. increase in number of a) primary schools collaborating with TNP, b) environmental workshops for children, c) youth involvement in Junior Rangers program, d) thematic days in the park. Our results point out that some environmental education indicators strongly focusing on environmental education for children and youth have already been in use in TNP. However, this study provides a complete workable compilation of indicators for further assessment of environmental education implementation in TNP, with a possibility to be applied to other protected Alpine areas as well.

Keywords

environmental education, indicators, national park.

Introduction

Environmental education unites formal and informal education on ecological systems and their dynamics, environmental problems, interrelations of humans-environment interactions and their effects on social cultural and economic development. The aim of environmental education is to educate people about environmental topics and issues, in order to raise their awareness, so that they adopt more responsible attitudes and behaviour towards the environment by making informed choices. According to ALPARC (2013), "environmental education and awareness-raising targeting the general public (visitors, local residents, schoolchildren, etc.) are two key components in the Alpine protected areas' role". In the past a series of workshops on mountain environmental education have been organized by ALPARC and "Mountain Environmental Education" Working Group is operating under ALPARC organization. As of the high importance of environmental education in the Alps we developed and assessed environmental education indicators in Triglav National Park, the only national park in Slovenia. Indicators are tools that meet the criteria of policy relevance, analytical soundness and measurability (BRIASSOULIS 2001) and can quantify changes, monitor performance and provide framework for setting targets (HUNTER & GREEN 1995; CRABTREE & BAYFIELD 1998).

We focused on answering following research questions. Which are the most important environmental education indicators from the Triglav National Park managers' perspective? Are environmental education indicators already being in use in TNP? What is the trend for the indicators that are identified as essential? The indicators derived in this study aim to evaluate environmental education impact and performance in view of their implementation in TNP.

The study on hikers' pro-environmental behaviour in TNP revealed that previous enrollment in environmental education activities is strongly correlated to willingness to pay for environmentally friendly goods and services (STUBELJ ARS 2013). TSAUR et al. (2006) found that interpretative service based on environmental education could help tourists develop more awareness in conserving and protecting resources. Thus we argue that increase in environmental education activities in the park will consequently influence locals' and tourists' behaviour and contribute towards more environmentally friendly behaviour and nature conservation. Monitoring of environmental education in the park can be provided by the use of indicators. Indicators should be used to support the framework for setting development targets and investment decision making regarding environmental education.

Methods

Based on the official TNP annual report 2008-2009 (2010) and park's web site (2010) we identified all environmental education related activities in TNP and proposed environmental education indicators list. Within the workshop held in May 2010 in the headquarters of TNP, eight protected area managers evaluated indicators importance and measurability in TNP based on their first-hand experience in implementing environmental education in the park. Out of eight TNP managers three were from professional services, two park rangers, one head of professional service, one working at Information Center Trenta Lodge and one working on a project. Five managers had more than 7 years of experience in working in TNP, two more than 3 years and one was recently employed on the project. The head of the professional service "Education and nature conservation education" has been working in the park for 24 years and contributed significantly to the workshop discussion. The managers took a survey on environmental education indicators in which they evaluated a list of 89 indicators according to their importance and measurability. The indicators importance was measured on a three-oldded value scale as *essential*, *desirable* or *not significant*. The managers have been asked to make a mark after each indicator if in their opinion the data for this indicator are already being collected by TNP or if the indicator is already being used in TNP.

Results and discussion

Environmental education decision dilemmas

There is a need for a strategic plan for the implementation of environmental education on national level, in which the role and importance of environmental education would be determined. As the only national park in Slovenia, TNP managers feel they should present a model of good practice at the national level. The strategy is needed for the development of infrastructure for environmental education (educational information points and educational trails in the park) and development of strategy how to use this infrastructure in terms of working directly with people. This raises the question of financing the educational programs. Aside from national funding there is a need to join synergies of different stakeholders and services and focus all of them on strategic plan for the implementation of environmental education. In this process the organizations that directly work in nature should be involved (mountaineering, hunting, fishing organizations). Managers find important to balance the environmental education activities between visitors and inhabitants. Making decisions and shaping new educational programs is a challenge in itself.

Managers took a standpoint that environmental education should receive more attention and funding. They find a need for strategic decision towards attributing greater weight to environmental education in terms of orientation and material support. All managers emphasized that for environmental education direct connection with nature is essential, and education should take place in natural environment as much as possible.

The environmental education indicators assessment

The list of 89 indicators was made based on the official TNP annual report 2008-2009 (2010) and park's web site overview (Triglav National Park 2010). Adopting the terminology of the sustainability indicators study of CHOI & SIRAKAYA (2006) we group the indicators in the following dimensions, based on the type of information they refer to: Direct environmental education (15 indicators), Events (3), Projects (3), Surveys (2), Guiding (3), Publications (12), Work (9), Professional events (6), Promotion (10), Collaboration in the Alps (5), Courses (2), Visitors (10), Funds (7) and Eco category (2).

We asked workshop participants to evaluate indicators importance on the value scale: *essential* (3), *desirable* (2), *not significant* (1). The managers also indicated which data are already collected or already being in use in TNP. The question on measurability of indicators in TNP was not answered by two managers.

In short survey conducted at the very beginning of the workshop only two out of eight TNP managers stated they are using indicators to measure the investment in environmental education activities. As for the indicators source of information they stated surveys conducted in TNP and data provided by the Alpine Association of Slovenia.

Environmental education indicators importance and measurability

We calculated the averages and standard deviations for indicators importance. The maximum average was 3 for seven indicators and the minimum 2.13 for one indicator. Due to the fact that all indicators have been evaluated between desirable (2) and essential (3), it is feasible to evaluate the use of all 89 suggested indicators in the future. We ranked the indicators according to their importance averages and clustered them in five groups (Table 1). In the following discussion we used the number of indicators in brackets to refer to the indicators being in a certain group or dimension.

Essential indicators

From the list of 89 environmental education indicators seven indicators were identified as essential by all workshop participants (average mark 3):

1. Number of environmental workshops for children,
2. Number of primary schools that collaborate with TNP,
3. Number of Junior Rangers in TNP,
4. Number of EU calls on which TNP applied,
5. Number of EU projects in implementation,
6. Number of environmental workshops for local inhabitants,
7. Number of thematic days (e.g. Wednesday's nights).

In the following we refer to those as *essential indicators*. By evaluating the list of *essential indicators* we draw a conclusion that: special attention is given to the education of children and youth (indicators 1., 2. and 3.), EU

projects present an important funding source (4. and 5.), the educational workshops for local inhabitants are of most importance (6.), as well as thematic days (7.) which are open days for the public and combine various groups of visitors according to their interests, age and origin.

Table 1: Indicators grouped in four groups based on their importance averages.

Groups	Importance averages	Number of indicators
1	3	7
2	2.99 - 2.76	15
3	2.75 - 2.51	42
4	2.50 - 2.26	23
5	2.25 - 2.00	2

In this group five indicators are directly or indirectly linked to environmental education (1. 2. 3., 6. and 7.), all of them involving people in educational activities or events. These five indicators belong to dimension Direct environmental education. The two other indicators focus on EU projects from dimension Funds, thus we conclude that applying for EU funding calls and later implementation of EU projects in TNP are of high importance and bring a significant international recognition to TNP. In order to illustrate the *essential indicators* use in TNP, we present the example of four *essential indicators* data in years 2000 to 2009 in Table 2.

Table 2. Examples of essential indicators for years 2000 and 2009. In year 2000 data for environmental workshops for children have been collected under lectures on the field.

Essential indicators (number of essential indicator)	2000	2009
Number of primary schools that collaborate with TNP (2.)	14	16
Number of environmental workshops for children (1.)	*	67
Number of thematic days (e.g. Wednesday's nights) (7.)	13	74
Number of Junior Rangers in TNP (3.)	from 2002	every year + 10
Number of lectures on the field (indicator in use)	59	23

Number of primary schools that collaborate with TNP has risen from 14 in year 2000 to 16 in year 2009. In the park there are six municipalities, but only one primary school in Soča, which is a branch of Bovec primary school. This indicates that 13 schools outside TNP borders collaborate with TNP. For the year 2000 data on *Number of environmental workshops for children* is within the *Number of lectures on the field* (indicator already being in use in TNP), thus we do not have exact data for year 2000. Still we can suggest that it would have been at least 36 or more, since in 2009 there were 23 lectures on the field. According to this calculation the indicator *Number of environmental workshops for children* shows the rise in number of workshops. *Number of thematic days (e.g. Wednesday's nights)* has risen by more than 5 fold in 9 years. This trend shows the popularity and variety of the thematic days organized in the park. Junior Ranger program, which is being conducted in some other Alpine national parks as well, is a success in TNP involving and educating youth from the park or it's immediate surroundings on conservation and sustainable management of the park. The program started in 2002 in TNP, and number of Junior Rangers in TNP continues to rise with the trend of 10 new Junior Rangers per year on average.

Summary of environmental education indicators assessment

In Table 3 we show the indicators importance results clustered in five groups according to their indicators importance and type of information they convey.

Direct environmental education indicators are present in groups 1 – 4. One third of them were evaluated as *essential indicators* being in the group 1 (average 3). Other two *essential indicators* are from the dimension Funds and focus on EU calls for projects and implementation of EU projects. Based on that, we conclude that direct environmental education indicators as well as EU funding are essential for evaluation of environmental education implementation in TNP.

In group 2 (averages 2.99 – 2.76) enter indicators from the following dimensions: Visitors (5), Direct environmental education (4), Events (3), Collaboration in the Alps (2), Work (1). Accordingly indicators for monitoring visitors, events and collaboration in the Alps are of high importance.

We argue that events in TNP are of very high importance for the implementation of environmental education in TNP since in general people are attracted by events and these may be used as outreach opportunities to the broader public. Events attract tourists to the park and at the same time present a possibility for the promotion of local products, services and culture.

From Table 3 we see the 42 indicators are clustered in group 3 (averages 2.75 – 2.51), corresponding to the 47.2% of the indicators being tested. In the third group indicators from all dimensions are present except from dimension Events, which have all been sorted in group 2 and dimension Surveys which have all been sorted in the fourth group.

Indicators group 4 (averages 2.50 – 2.26) contains 23 indicators from eight indicator dimensions. It is important to emphasize that in this group are: 7 out of 12 Publications indicators and 5 out of 10 Promotion indicators.

Indicators *Number of conference publications (abstract, poster)* and *Number of organized recreational activities (e.g. trekking)* have been found less important than the 97.7% of all indicators. These two indicators have been sorted to group 5 (averages 2.25 – 2.00).

Finally, we should state that environmental education indicators are already in use in TNP, but currently there is no publication available that would offer the overview of the indicators in use. On the workshop TNP managers evaluated 37 out of 89 suggested indicators as already being measured in TNP or data are being collected for their

assessment, which corresponds to 41.6% of the assessed indicators. Based on this result we conclude that even though data for environmental education indicators are being collected and in use in TNP, systematic approach is needed to use full capacity of this analytical method.

Table 3: Indicators groups and dimensions sorted in five groups based on their averages.

Indicators' dimension (Number of indicators)	Indicators' group based on averages				
	1	2	3	4	5
Indicators' importance averages	3.00	2.99 - 2.76	2.75 - 2.51	2.50 - 2.26	2.25 - 2.00
Direct environmental education (15)	5	4	3	3	
Events (3)		3			
Projects (3)			2	1	
Surveys (2)				2	
Guiding (3)			2		1
Publications (12)			4	7	1
Work (9)		1	6	2	
Professional events (6)			6		
Promotion (10)			5	5	
Collaboration in the Alps (5)		2	3		
Courses (2)			2		
Visitors (10)		5	3	2	
Funds (7)	2		4	1	
Eco category (2)			2		

Conclusions

The indicators being developed and tested in this study fall in the following indicators' categories: direct, analytical, objective as they refer to quantitative data, measuring the influence on people and indirectly to their environmental, socio-economic environment, having integrated main dimension and being local, since they evaluate environmental education in Triglav National Park. Still having the potential to be applied to other protected areas in Slovenia and even to other protected areas in other Alpine countries, spatial scale of environmental education indicators developed and assessed in this study might grow to be national or even global.

We identified seven *essential indicators* which could be used in other protected areas in the Alps to make an overview of environmental educational activities through time across the Alpine space. By analyzing data for four essential indicators, this study identified the trend of significant increase in environmental education activities for children and youth in the park and fivefold increase in thematic events organized by Triglav National Park in decade from 2000 to 2009.

The study provides valuable information for Triglav National Park managers and other stakeholders that are involved in the implementation of environmental education activities in protected areas in Slovenia and abroad. The outcomes of this study are useful for future work on indicators development in other protected areas as well.

Acknowledgements

The author thanks to Mag. Martin Šolar, director of Triglav National Park and to eight TNP managers who participated in environmental education workshop, completed the indicators survey and shared their valuable experience regarding environmental education implementation in the park. For help in conducting the workshop and valuable advices, the author thanks to Prof. Dr. Marko Bohanec. This research has been funded by Slovenian Research Agency through the Young researcher program.

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