Agriculture University of Tirana

2nd European GREEN Conference-EGC 2024
11-14 June 2024 Vodice, CROATIA

Second EUROPEAN GREEN CONFERENCE
11-14 June 2024 Vodice, CROATIA

Evaluation of climate change implications on park management: Case study Divjaka-Karavasta National Park, Albania.

Doriana (BODE) XHULAJ *, ENEA MALAJ
Department of Environment and Natural Resources, Faculty of Environment and Agriculture, Agricultural University of Tirana, Albania
Forest Department, Faculty of Forest Sciences, Agricultural University of Tirana, Albania

Introduction

Managing protected areas from climate change is a complex process. The purpose of this study was to evaluate how climate change impacts on protected areas can be better understood at the park manager and local community level. Managers of the protected area expressed that this National Park is important as the only habitat in Albania used for the growth and reproduction of the curly pelican (*Pelecanus crispus* Bruch) but also for the Mediterranean forest with wild and soft pines (*Pinus halepensis* Mill. and *Pinus pinea* L.), which make it one of a kind. According to community perception, the main causes of climate change were deforestation, pollution, and carbon emissions. Three of the foremost elements perceived as most sensitive to climate change were: extreme weather events (58.2%), water supply, and agriculture (40%). There were also concerns about how climate change will affect tourism and recreation, the disturbance of function and loss of ecosystem services, and the economic activity of the area. The survey results gave an understanding of the socio-ecological characteristics of the region. This is an important step to improving park management adaptation to climate change by understanding people's perceptions and values relating to climate change and where significant differences lie.

Material and Methods

2.1 Study area: Our study area refers to the Divjakë-Karavasta National Park (the second category of protected are-as), with a total area of about 22398.08 ha (VKM No. 59 dated January 26, 2022). Divjakë-Karavasta Park is located in the central part and on the western coast of Albania. In the north, it is bordered by the Shkumbin River, in the east by the hills of Divjaka, the Myzeqesë watershed, the Seman River in the south, and the Adriatic Sea in the west.

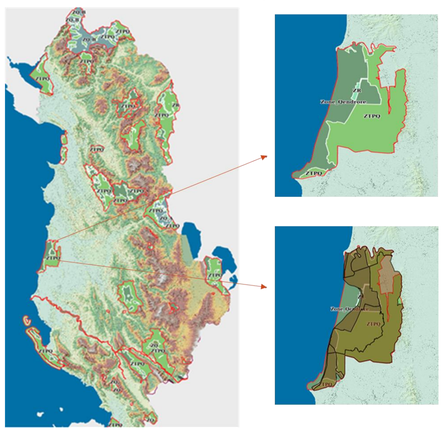

Figure 1. Protected area under study https://geoportal.asig.gov.al/map/2022

The climate in the coastal plain is typical Mediterranean, with an average rainfall of 893 mm in Divjaka. The rainfall in Divjaka in the amount of 70 to 75% occurs from October to March. Evapo-ration estimated from the climate data of the Mbrostar station, reaches an annual value of about 1200 mm.
2.2 Data collection: In this study, we used a survey of the local community, neighbors of protected areas, and park staff. We conducted a total of 110 interviews with the local community for a period of time from February to June 2023. The completion of the questionnaire was carried out in the field in order to include as wide a participation as possible, including suburban and rural communities. Additional questions were asked of Park Administration staff regarding the current values, threats, management, and monitoring of the protected area they manage. The analysis aims to answer questions such as: What knowledge do respondents have about climate change, and how concerned are they? What impact do they perceive as most important? How different groups of respondents compare in their concerns and perception.

Results and Discussion

3.1 Results of local community on climate change impact on park area.

The community and park neighbors survey gave an understanding of the socio-ecological characteristics of the region. The survey showed that most of the participants (60%) share with us a very high feeling of concern, followed by 36.4% with an average concern, slightly worried (1.8%), and not worried (1.8%).
The question of what you think climate change is was accompanied by different opinions (Figure 1). A high percentage of respondents listed changing temperatures as one of their highest concerns and challenged what climate change is (29%). The community shares low percentages of perceptions about the change in forest vegetation, the change in atmospheric pressure, and the rise in sea level (Figure 1).

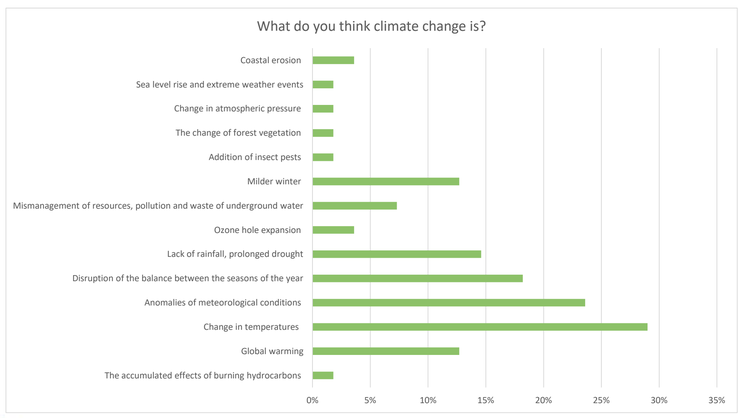

Figure 1: Results of the community perception on climate change.

Results and Discussion

The perception of the respondents on the main causes of climate change, summarizing them in at least three, was that most of them confirmed that the reduction of forest areas is ranked as the most important (47.30%) (Figure 2). This cause is followed by pollution (industrial pollution, atmospheric pollution) (29%) and, with equal percentage values (12.70%), elements such as mass industrialization, misuse of natural resources, human factor, and burning of hydrocarbons.

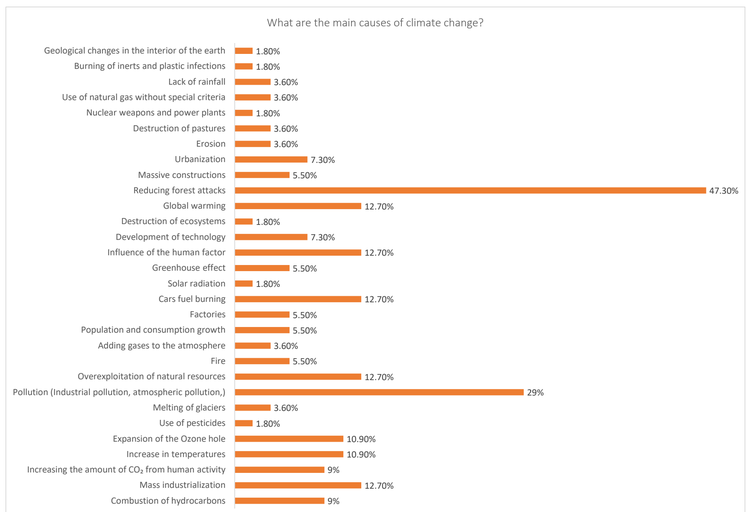

Figure 2. Participants results on the three main causes of climate change.

The most important respondents thought that the main causes of climate change were deforestation, pollution, and carbon emissions from coal and oil. Landfill is perceived as important, followed by methane emissions.

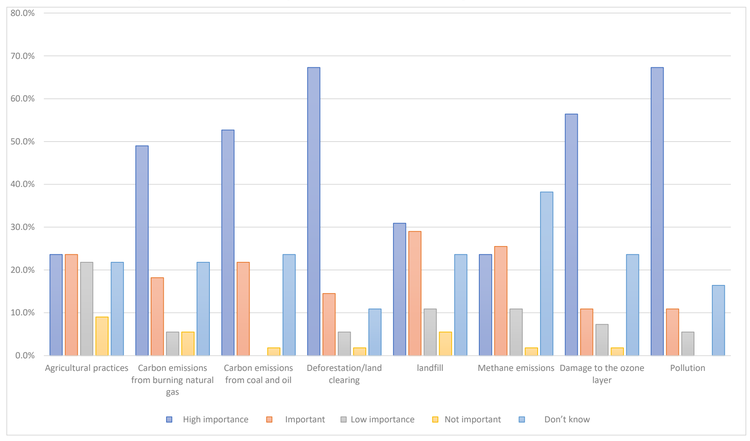

Figure 3. Participants results on the three main causes of climate change.

In the assessment of climate change on a global scale proposed in the conducted interview, among the 13 elements, 10 are considered to be of high importance (Figure 4), while only two elements were not known by the participants, specifically about winter longer/colder (27.3%) and ocean salinity (50.9%).

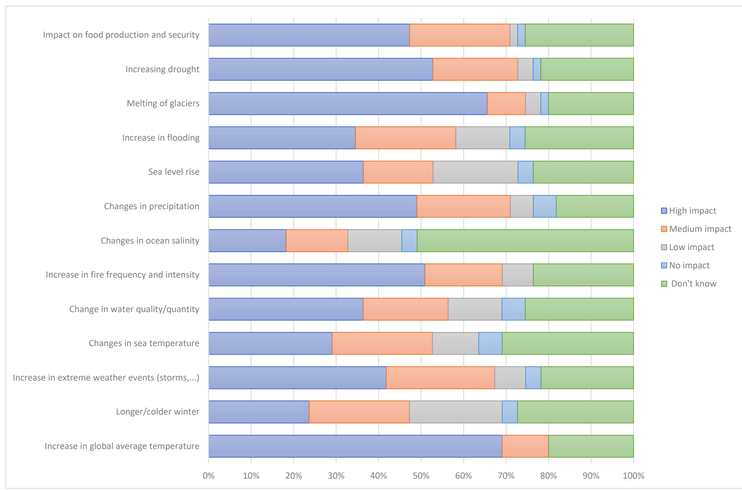

Figure 4. Assessments of the importance of climate change impacts on a global scale

Community representatives were also asked how they assess the importance of the proposed impacts of climate change on the natural environment in the local area where they live. Among the proposed impacts, five of them present the highest response values, the one with a medium impact (Figure 5).

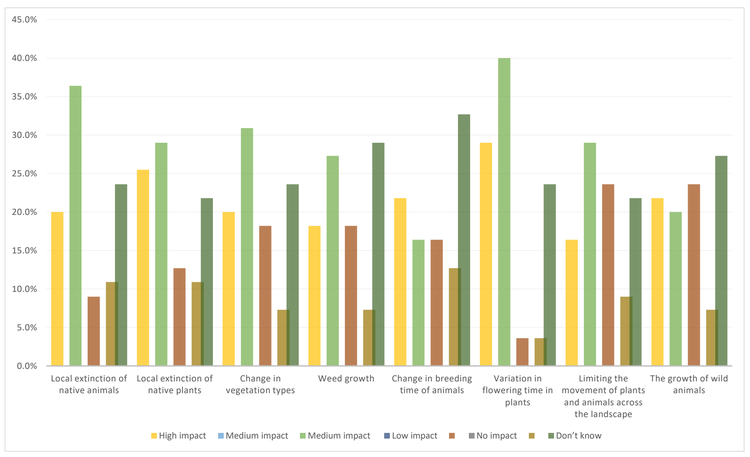

Figure 5. Results on the importance of climate change impacts on the natural environment in your local area

Results and Discussion

We asked respondents to share with us at least three of their concerns that may be affected by climate change (Figure 6). From their responses, three of the main elements that are perceived as most sensitive to climate change are: the most extreme weather events (58.2%), water supply, and agriculture, each with 40%.

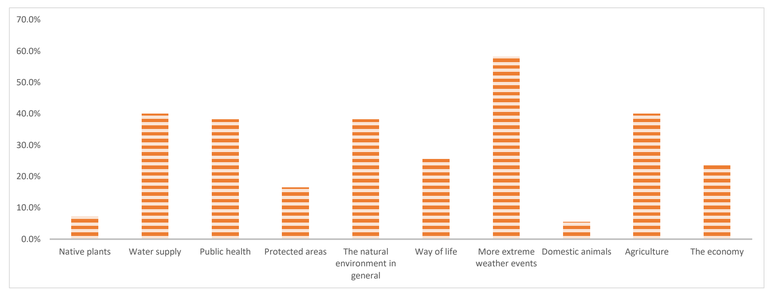

Figure 6: Perception results of the community on elements of most concern from climate change.

Figure 7 shows that nine of the threats are perceived by the respondents as being of very high threat, highlighting: illegal hunting of animals, big changes in temperature, pollution, inappropriate management, and changes in habitat due to climate change.

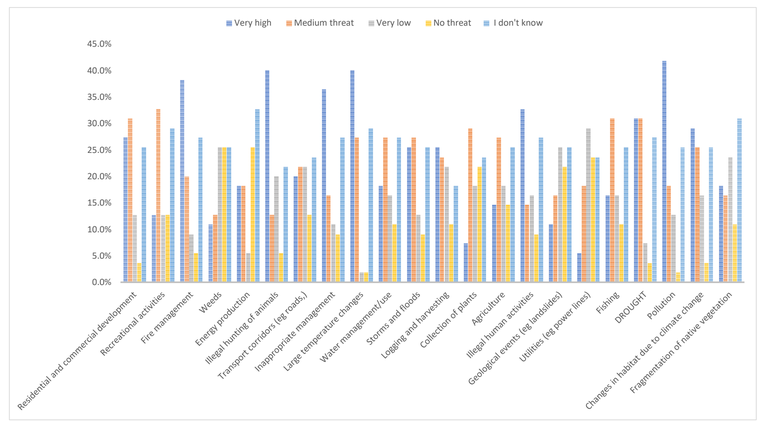

Figure 7: Results of the local community on the potential threats to the protected area

Managers of the protected area (100%) expressed that the high level of biodiversity and diversity of plant species, together with the fact that it is the only and largest wetland complex in terms of its importance, the shelter of a large number of birds, and the diversity of aquatic species, are two of the significant values of this protected area. Meanwhile, 43% thought that this protected area is important because it is the only habitat in Albania for the growth and reproduction of the Curly Pelican (*Pelecanus crispus* Bruch) but at the same time, here in this complex there is the Mediterranean Forest with wild and soft pines (*Pinus halepensis* Mill. and Pinus pinea L.), which unify this forest and make it one of a kind. Park managers were asked about various intervention proposals in the national park under study.
According to them, although the area enjoys protection status and has a management plan in force, there is still a need for intervention in the management of this park, citing: To study the carrying capacity of visitors to the park, visitors cannot visit the park at any time. To limit the spaces of free movement in the park. To improve the financial mechanisms (collection of income from the use of the park and use of the income for improvement investments).
Management of fishing activity by the Administration of Protected Areas (we have to monitor fishing; we have a decrease in the number of fish). A new development plan must be implemented in the park; we have unauthorized constructions that are not in harmony with nature.

Conclusion

The survey of the community and neighbors of the park provided an understanding of the socio-ecological characteristics of the region. This is an important step for improving the adaptation of park management to climate change by understanding local community perceptions and values regarding climate change and where important differences lie.
Managing protected areas from climate change is a complex process. Decision-making and management strategies should be as effective as possible in the context of a protected area. It must take into account not only the possible impacts but also be considered within a socio-ecological framework for park management to be as effective as possible. Climate change will change the way protected areas currently look, and their governance needs to adapt to how they might look in the future.
It is important that climate change management is included in an adaptive management framework and that responsible agencies adopt a flexible adaptive approach to decision-making. The decision to move forward with any particular strategy should not be a foregone conclusion. Over time, local communities evolve, political environments change, species migrate, and ecosystems transform, requiring that other strategies become more viable and a change in management objectives be needed.

Contact Information

Assoc. Prof. Doriana (Bode) XHULAJ
Department of Environment and Natural Resources
Faculty of Agriculture and Environment
Agricultural University of Tirana, Albania
'Pajsi Vodica',1029 Tirana, Albania
Email: dbode@ubt.edu.al