

# Investigation of factors and risks threatening the environmental health of natural lakes in Band-e Amir National Park, Bamyan

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**Keywords:** Band-e Amir — Bamyan — Environment — Ecosystem.

**CHNT Reference:** Marzieh K. and Mohammad R.A. (2021). 'Investigation of factors and risks threatening the environmental health of natural lakes in Band-e Amir National Park, Bamyan', in CHNT – ICOMOS Editorial board. *Proceedings of the 26th International Conference on Cultural Heritage and New Technologies*. Heidelberg: Propylaeum.

Humans' use of the territory greatly influences the lives of various plant and animal species. The degradation of natural habitats and their conversion to other uses have made it difficult for different species to live. So, protected areas as the last solution to protect biodiversity, are of great importance.

The present study is descriptive-analytical research which first identifies and discusses the potentials and features of Band-e Amir protected area in Bamyan through library studies and then examines the factors threatening, and the negative effects of local people and tourists' activities as well as the roles of education and cultural in preserving the region. The results indicate that guarding Band-e Amir protected area can bring positive achievements such as protection of the region, increased employment with the development of ecotourism industry, environmental education, and cultural exchange, in addition to protecting rare animal and plant species.

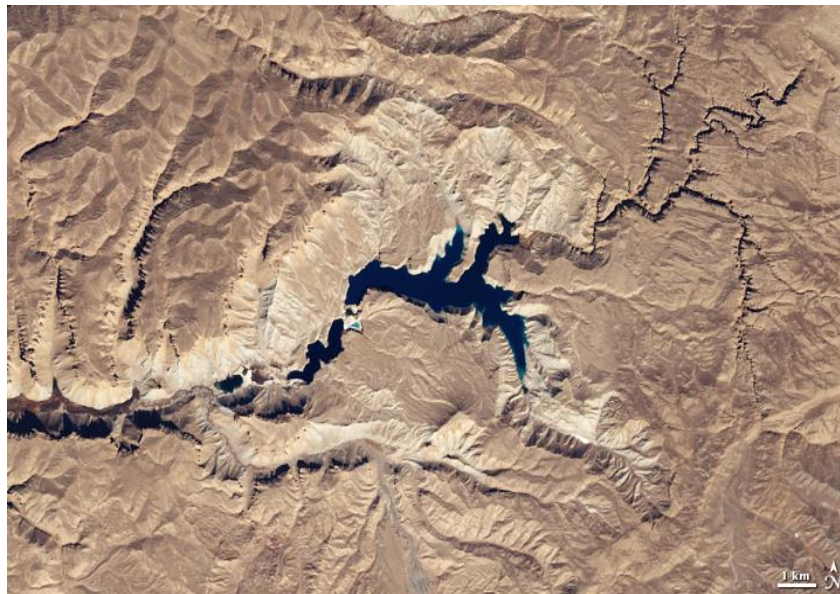
The global ecosystem in Afghanistan is divided into three parts, all of which are located in the mountainous regions in northeast Afghanistan. These ecosystems have been classified as follows: 38% as endangered ecosystems, 61% as vulnerable ecosystems, and only 1% as unchanged ecosystems (Afghanistan's Fifth National Report to the United Nations, 2014).

Bamyan City in Afghanistan is one of the largest tourism hubs due to its valuable historical monuments and beautiful natural landscapes. In 2009, Band-e Amir region, due to having natural blue lakes, was registered as the first national park in Afghanistan to protect natural attractions and prevent the extinction of animal and plant species.

Band-e Amir National Park, which is located in the highlands of the Hindu Kush Mountains, consists of six natural lakes. The water of the lakes, which comes from the surrounding high and snow-covered mountains, is composed of minerals, and the deposition of hard minerals (travertine) has led to the natural formation of the dam walls over time. The Band-e Amir region is one of the few regions in the world, where there are natural dams with travertine structures ([www.earthobservatory.nasa.gov](http://www.earthobservatory.nasa.gov)) (Fig1- The harsh landscape).

Human activities are one of the important issues in threatening and polluting the environment. Due to the increasing presence of domestic and foreign tourists in Bamyan, the human-environment relationship has become broader and more diverse, followed by numerous problems such as pollution, climate change, destruction of natural habitats, etc. In the city of Bamyan, human activities threaten the environment from two perspectives:

1. Local people threaten protected areas and pollute the environment by destroying habitats and farms to provide firewood in the cold season, overgrazing and overhunting animals and aquatic animals, with special fishing methods including the use of hand-thrown grenades and explosions in the lake. The discharge of greywater into the lakes, waste dumping, and hunting aquatic animals in the coming years will lead to the pollution of Band-e Amir lakes and thereby the degradation of this natural masterpiece. Human-derived wastewater contamination can cause the contamination of aquatic animals, that is transmitted to humans through the consumption of seafood contaminated with intestinal microbial pollutants or direct contact, i.e. drinking seawater and swimming in contaminated water. Moreover, swimming in lakes, in addition to water pollution, increases the chances of transmitting infectious diseases (Diseases that occur due to the lack of water use for hygiene, like scabies, skin rot and ulcers, leprosy, lice, trachoma, and others) (Fig2- pollution of lakes).



*Fig. 1. Landsat Satellite - Image of Band-e Amir on October 22, 2002. The harsh landscape indicates the terrain around the lakes. Overhanging cliffs create sharp lines and shadows on the south side of the lakes. The color of the lakes ranges from pale turquoise to deep blue, creating a pristine and special phenomenon. (www.earthobservatory.nasa.gov)*



Fig. 2. The presence of tourists in certain seasons and pollution of lakes by boating (<https://afghanistan.asia-news.com>)

2. The presence of tourists in certain seasons and unplanned ecotourism lead to the degradation of the natural ecosystem. Tourists swimming in the lake, dumping garbage in the water and using old boats cause damage to the lakes. Mismanagement in organizing tourists will cause irreparable damage to the region.

According to studies, tourism is an socio-economic activity in coastal communities, which deteriorates marine-coastal ecosystem quality when poorly managed, increasing litter pollution on beaches during the main tourist seasons (Garcés-Ordóñez, 2020). Massive influxes of tourists on beaches (often beaches with deficiencies in management) have a negative impact on the environmental quality of ecosystems (Ghosh, 2011).

What is important in this research is the pollution of the waters of Amir Bamyán Dam because water pollution is not less dangerous than air and soil pollution. Water pollution of Band-e Amir is important in that all of them are negatively affect the lives of humans and animals alike. Directly and indirectly, water is polluted with germs, solid and liquid wastes. These pollutants change their color, taste and aroma. Moreover, the continuity of the abovementioned issues and lack of attention to them lead to the extinction of rare animal and plant species and make lakes bogs. This not only destroys marine habitats but also greatly threatens the health of the surrounding human communities.

One of the basic measures to create to create responsibility among the natives of the region is public culturalization to preserve the lakes.

Environmental education and public culturalization, especially public awareness through the media, seem one of the most important ways to preserve this valuable heritage. Also, the involvement of local people in the protection of Band-e Amir National Parks can be one of the most effective conservation measures.

Effective advertising to raise awareness is one way to protect the area also the field of "art" is one of the fields very active in the protection of the environment. Combining art, education, and culture through effective advertising, such as "Guerilla" advertising, can greatly affect the audience's mind, with little budget.



Fig. 3. Effective advertising in forest protection. Advertising Agency: An agency called England, UK (<http://www.Englandagency.com/>)

Guerrilla advertising is rightly viewed as a spectacular advertising tactic with low costs and viral potential, but it's much more than that. It's got an emotional pull and a future-oriented approach – and it's once again showing itself to be a step ahead by going green.

The message to people is often designed to be clear and concise. This type of advertising also works on the unconscious mind, as decisions are often made by the unconscious mind. To keep the effect of message in the unconscious mind requires repetition, so if a buzz is created around a message or photo, and it is shared, it enables repetition.

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