Nature and Science

Websites:
http://www.sciencepub.net/nature
http://www.sciencepub.net

Emails:
naturesciencej@gmail.com
editor@sciencepub.net

MARSLAND PRESS
Multidisciplinary Academic Journal Publisher

Modification Of The Landscapes Of The Fergana Valley And Features Of Their Development

Mirzahmedov Ismoiljon Karimjon ugli

Departament of Geography and environmental protection, PhD, Docent, Namangan State University, Namangan, 160107, Uzbekistan
E-mail: ismoil_landsat@mail.ru

Abstract. The Fergana Valley is one of the most complex and dynamically changing regions in Central Asia. The landscapes of this area are constantly transforming under the influence of both natural and anthropogenic factors. This study analyzes the geomorphological structure, climatic conditions, hydrographic characteristics, and human-induced changes in the valley. In particular, it examines the degradation of landscapes, soil erosion, and environmental challenges resulting from agriculture, industry, and urbanization. Furthermore, the research discusses sustainable development strategies for the landscapes of the Fergana Valley, measures for environmental protection, and ways to maintain ecological balance. The findings of this study are essential for environmental management and regional planning in the area.
[**Mirzahmedov I.K.** Modification Of The Landscapes Of The Fergana Valley And Features Of Their Development. *Nat Sci* 2025,23(5):19-22]. ISSN 1545-0740 (print); ISSN 2375-7167 (online). http://www.sciencepub.net/nature 04. doi:10.7537/marsnsj230525.04

Keywords: landscape modification; geomorphology; anthropogenic impact; environmental challenges; biodiversity conservation; water management.

1. Introduction

The change of landscapes under the influence of natural factors is a continuous process. Due to climate change, tectonic movements, erosion, the influence of glaciers and biological processes, the forms of the earth's surface are constantly modified. These processes can occur in some cases slowly (over thousands of years), and sometimes quickly (as a result of earthquakes, floods). The study of natural modification of landscapes is of great importance for future environmental protection and the efficient use of natural resources.

Modification is one of the defining characteristics of landscapes. These changes are driven by many ecological processes, such as species movements and physical flows. In addition, human activities are an important factor in the changes. Observing and understanding changes is a prerequisite for the management of natural resources. Scale dependence is one of the remarkable features of landscape dynamics.

2. Material and Methods

The Fergana Valley is constantly changing under the influence of natural factors, and these changes are manifested differently in different regions. Also, the landscapes around Kokand and Margilan are experiencing changes in precipitation, drought and reduced water resources, which negatively affect agriculture. Soil salinization and reduced fertility are observed, while irrigated lands in Toshlok and Bagdad are affected by water shortages. As a result of drought, vegetation cover has decreased in some areas.

The foothill landscapes of Andijan and Namangan regions are among the seismically active regions, where weathering and cracks are observed as a result of earthquakes. The landscapes of Rishton and Yozyavon districts are experiencing soil erosion due to wind erosion, which is reducing their fertility. Sand and dust storms are observed in these areas. The mountainside landscapes of Fergana and Andijan regions are experiencing soil erosion due to rain erosion and landslides. The landscapes of Pop and Chust districts have experienced increased soil erosion as a result of deforestation, which is leading

to land degradation. The landscapes of Oltiariq and Uchkuprik districts have experienced a decrease in natural vegetation cover due to agricultural activities, which is negatively affecting land fertility.

Landscape use constraints are a common feature of agricultural landscapes. They are also related to the interaction between the cultural and ecological components of landscapes. Landscapes are constantly changing in space and time. No landscape remains static, but the timescales of change vary from months to millennia. Landscape change depends on the forces that shape and drive them. These forces range from global climate change to local crop management by farmers. Along with geological processes, the socio-economic policies of the state also govern landscapes. Landscape change and development also have an impact on biodiversity. The composition of flora, fauna, and soils shows how landscapes have changed from the past to the present.

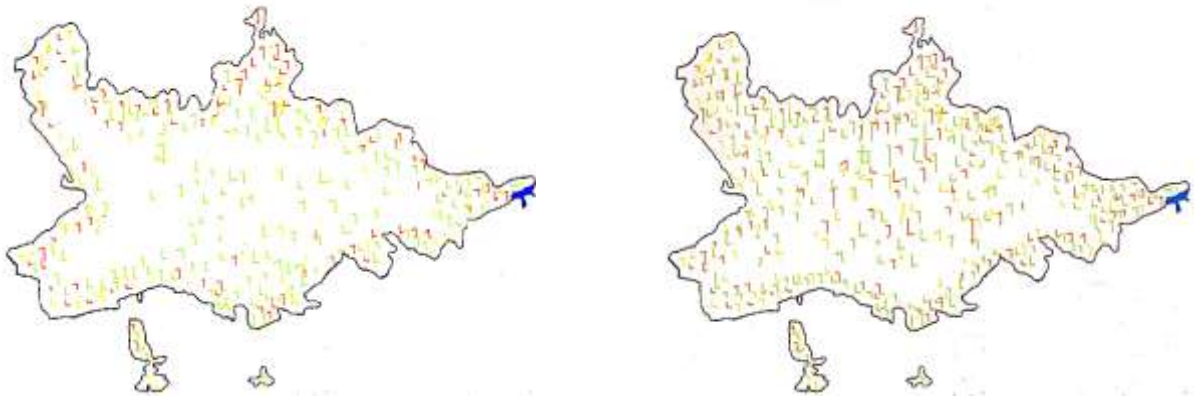
Landscape changes are reflected in the desert, hill, steppe and mountain regions over a period of 1 year to a long hundred years. Along with natural factors, the human factor also plays a significant role in the formation and development of the landscapes of the Fergana Valley. Landscapes that have changed and developed as a result of the direct impact of humanity on nature are gradually reflected in changes in plant, animal and soil cover (Figure 3).

3. Evolutionary changes in biodiversity (in thousands)

No.	1990	2000	2010	2020
Plant cover	4000	3800	3750	3600
Animal world	100 thousand	87 thousand	82 thousand	78 thousand

Source : Uzbekistan Republic Red book based on was created .

Biodiversity is constantly changing under the influence of natural and anthropogenic factors. Evolutionary, ecological, climatic and anthropogenic laws determine this process. Measures taken by humans (nature protection, creation of national parks, rational use of resources) can contribute to the preservation of biodiversity and sustainable development.



2000 year **2010 year**

2020 year

Conventional symbols: *plant world (green lines), animal world (yellow lines) and soil cover (red lines).*

Figure 4. Changes in biodiversity of the Fergana Valley

The biodiversity of the Fergana Valley is unique among other regions. However, due to human influence, we are currently witnessing a decline in its biodiversity and a negative impact on soil fertility (Table 1).

No.	Changes in biodiversity	Reasons	Preventive measures
1	Decline of animal and plant species	Deforestation, poaching, habitat loss	Increase national parks and reserves, control poaching
2	Changes in ecosystems due to climate change	Global warming, industrial emissions, greenhouse gases	Using green energy, reducing CO_2 emissions
3	Degradation of E cotysis	Plastic waste, water pollution, overfishing	conservation zones, reducing plastic waste
4	Land degradation and desertification	Agriculture, deforestation, wind erosion	Planting trees, using ecological technologies to increase soil fertility
5	Decrease in genetic diversity of plants and animals	Monoculture, biological contamination, genetic modification	Developing sustainable agriculture, preserving natural habitats
6	Melting glaciers and depletion of water resources	Global warming, increased CO_2 in the atmosphere	Taking measures against climate change, using water resources economically
7	Disruption of ecosystems due to air and water pollution	Industrial waste, chemical fertilizers and pesticides	Reducing industrial waste, transitioning to environmentally friendly agriculture
8	Decline in birds and pollinating insects	Pesticides, urbanization, climate change	Limited use of chemicals, introduction of pollinator conservation programs

According to him, biodiversity (biological diversity) is the variety of living organisms and their habitats, and is one of the important factors ensuring the stability of ecosystems. However, in recent years, a decrease in biodiversity has been observed due to natural and anthropogenic factors. Changes in nature have a significant impact on biodiversity. Although these processes occur over a long period of time, they can sometimes occur unexpectedly. For example, the increase in temperature as a result of global warming is affecting the habitats of animals and plants, changes in precipitation are negatively affecting forest and aquatic ecosystems, and the melting of glaciers is causing changes in water flows, leading to the death of some aquatic organisms.

3. Results

Human activities have a much stronger impact on biodiversity than natural factors. In

particular, forests, in addition to being a major source of oxygen, are a habitat for many living organisms, and deforestation increases soil erosion and reduces soil fertility.

Biodiversity conservation is one of the most pressing environmental issues of our time. Natural ecosystems are being seriously damaged by human activities, leading to the loss of plant and animal species. The global biodiversity is rapidly declining due to the misuse of natural resources, urbanization, climate change, poaching and pollution. If this process continues, the sustainability of ecosystems and food security for future generations may be at great risk.

Therefore, it is necessary to implement the following important measures:

– expanding protected areas and increasing the number of national parks;
– reducing environmental pollution and using environmentally friendly technologies;
– strict control over poaching and illegal hunting and increased penalties;
– switching to renewable energy sources and reducing CO_2 emissions;
– developing sustainable agriculture and preserving natural habitats;
– promoting the importance of biodiversity through education and the media;
– control of industrial waste and reduce their harmful effects;
– developing global strategies to promote international cooperation and ensure environmental sustainability.

4. Conclusion

Everyone should contribute to nature conservation. Our attitude to the environment determines the future of our planet. Therefore, it is the responsibility of each of us to create a sustainable ecological environment and preserve natural diversity. Only then can we leave healthy and sustainable ecosystems to future generations.

Author: Mirzahmedov I.K.
Departament of Geography and environmental protection
Namangan State University, Namangan
E-mail: ismoil_landsat@mail.ru

References:

1. Odum EP "Ecology: Principles and Problems" – Moscow, Mir Publishing House, 1986.
2. Wilson, EO "Biodiversity" – National Academy Press, Washington, 1988.
3. Smith TM, Smith RL "Ecology: A Global Analysis" - Moscow, 2011.
4. Chivian E., Bernstein A. "Health and Biodiversity" – Oxford University Press, 2008.
5. IUCN (International Union for Conservation of Nature) reports and analyses – 2022.
6. UNEP (United Nations Environment Programme) data and reports – 2021.
7. Mirzahmedov I.K. Soils of the Kokand oasis and their ecological reclamation // Экономика и социум. №3 (82), 2021. -Russia. –P. 182-186.
8. Boymirzaev K., Abbasov S., Mirzahmedov I. Functional Integrity Of Oasis Landscapes And Their Study As Dynamic Geotisym // Nature and Science. 2021; 19 (5). -USA.–p. 44-45.
9. Mirzahmedov I. Dynamic Changes In Hydroecological Conditions For The Distribution Of Sokh Cones And Issues Of Their Protection // Nature and Science. 2023; 21 (1). -USA. –p. 19-27.

4/25/2025