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"INTEGRATION OF RECREATION AREAS AND HOUSING IN MOUNTAINOUS AREAS WITH THE LANDSCAPE AND ECOLOGICAL ENVIRONMENT"

Key words: Mountain regions, rural housing architecture, landscape design, ecological integration, natural environment, sustainable development, topography, local materials, energy efficiency.

Annotation

This article discusses the issues of integrating rural houses located in the mountainous regions of Uzbekistan with the natural landscape and achieving ecological harmony. It analyzes the specific features of mountainous terrain, climatic conditions, and the use of local building materials. The paper identifies key principles for designing energy-efficient, environmentally sustainable, and culturally appropriate rural architecture. Recommendations are also provided for developing housing projects that are well adapted to the natural environment and harmoniously integrated into the landscape.

Introduction

The natural, socio-demographic, and economic conditions in the Republic of Uzbekistan create a solid foundation for shaping the modern appearance of rural areas. At the same time, ecological sustainability has become an integral part of rural infrastructure. In mountainous regions, this process is closely related to terrain, climate, water resources, and landscape conditions. Therefore, ensuring ecological integration and harmony with the natural environment has become an urgent issue in rural housing design.

In recent years, under the initiative of the country's leadership, a series of measures aimed at improving the living standards of the population have been implemented. The development and consistent implementation of state programs have opened a new era in this field.

As can be seen from the maps, settlements located in regions bordering the Republic of Tajikistan are situated at altitudes of 2000 meters and above. From an architectural perspective, large-scale works are being carried out to improve planning systems and develop housing and social infrastructure projects.

Methodology

Analytical–methodological approach:

Architectural objects, rural housing systems, landscape characteristics, and ecological conditions in Uzbekistan's mountainous areas were analyzed. Comparative studies were also conducted with foreign examples (Turkey, Georgia, Nepal, Italy, Japan).

Cartographic and topographic analysis:

Relief, wind direction, solar radiation, water sources, and land structure were studied based on maps.

Survey and observation method:

The lifestyle, construction traditions, and ecological attitudes of residents in mountain villages (for example, in Kashkadarya, Samarkand, Surkhandarya, and the foothill areas of the Fergana Valley) were studied.

Architectural modeling:

To test the integration of architectural forms with the landscape, computer modeling was carried out using AutoCAD, Revit, 3ds Max, SketchUp, and Lumion.

Environmental impact, waste management, and water and energy consumption levels of housing projects were measured. The ecological awareness, local values, and attitudes toward sustainability among residents were also studied.

Lifestyle of mountainous regions (Uzbekistan) photo-3

Rural Life in Mountainous Areas

The main economic activities of people living in Uzbekistan's mountainous and foothill regions are agriculture, livestock farming, horticulture, and beekeeping — all directly dependent on natural resources. Their lifestyle is shaped by the availability of water, climate, and relief conditions.

Mountain villages are typically located in river valleys, along streams, or at the foothills, where the landscape is scenic but construction space is limited. Hence, houses are built in harmony with the terrain, considering slopes and wind direction.

A survey was conducted to analyze the living conditions and housing features in mountainous and foothill areas

2-table.

Which category does your area belong to?	**How do you assess living conditions in your area?**	**What material is your house built from?**	**What do you consider the biggest problem?**	**What are the living conditions in winter?**	**What improvements are needed to make your home more comfortable?**	**If possible, would you like to move to another area?**	**Do natural disasters (landslides, avalanches, etc.) occur frequently in your village?**
Foothill	Very comfortable	Wood	Road and transport issues	Slightly inconvenient	Comfortable	No	Yes
Foothill	Average	Clay	Road and transport issues	Slightly inconvenient	Needs water and roads	No	Yes
Mountainous	Uncomfortable	Clay	Heating system absence	Very difficult	Need heating improvement	Undecided	Sometimes
Mountainous	Very comfortable	Brick	Power outage	Comfortable	Everything is fine	No	Sometimes
Mountainous	Average	Clay	Distance to healthcare	Slightly inconvenient	Restore power lines and schools	Undecided	No

Key aspects of rural life include:

Use of local materials (brick, stone, wood, clay) — cost-effective and environmentally safe.

Traditional housing structure — courtyard-type houses with verandas, flat roofs, and good natural ventilation adapted to the local climate.

Community-oriented lifestyle — strong neighborly relations, mutual help, and adherence to traditional values.

Harmony with nature — sustainable use of natural resources such as water and soil, and balanced coexistence with the environment.

However, in recent years, socio-economic changes, migration, and uneven infrastructure development have significantly affected rural life, leading to growing ecological issues.

Ecological Problems in Mountainous Villages

Environmental problems in mountainous settlements arise mainly from the fragility of the natural environment and human activities. The most common issues include:

Decline and pollution of water resources:

Melting glaciers caused by global warming reduce freshwater availability. The absence of sewage systems also lowers drinking water quality.

Soil erosion and reduced fertility:

Unsuitable farming on steep slopes causes soil degradation and productivity loss.

Deforestation and habitat destruction:

Cutting down trees for fuel and construction decreases green cover, increasing risks of landslides and floods.

Waste management problems:

Lack of waste processing systems leads to pollution of soil and water sources.

Climate change effects:

Temperature fluctuations, uneven rainfall, and droughts make living conditions harder and accelerate rural depopulation.

Need for Ecological Sustainability

Today, improving the quality of rural life while ensuring ecological safety is crucial. This requires:

Housing Features in Mountainous Regions

In Uzbekistan’s mountainous zones, local residents traditionally built houses based on terrain conditions. These buildings often have basements (cellars), small courtyards, and use locally available materials such as stone and adobe.

For example, in the Fergana Valley mountain areas, folk architecture is characterized by the use of natural materials, craftsmanship, and earthquake-resistant designs. Due to limited flat land, houses are built in terraced formations — the lower level is used for livestock, and the upper level serves as a living area and courtyard.

Mountain settlements can be categorized into four main types based on topography and socio-economic conditions:

Low-altitude areas — located near farmlands and gardens, with large plots and flexible design.

Small rural clusters — with limited land and compact settlements.

High-altitude villages — with minimal agricultural land and compact housing.

Terraced settlements — small courtyard houses interconnected with neighboring ones.

In Kashkadarya, two-family houses are common, with two or three rooms and corner verandas. The houses are arranged around a central courtyard. Similar designs are found in Nurota as well.

In Samarkand's Urgut district, winters are cold (around –40°C) and summers are mild. Southern houses are built from clay due to limited sunlight, while northern houses are made of stone, abundant in mountain areas. House orientation and room layout reflect centuries of adaptation to the climate, forming what is now known as the "traditional national house."

Mountain housing designs also naturally ensure ventilation and thermal balance due to the cooler mountain air compared to plains.

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