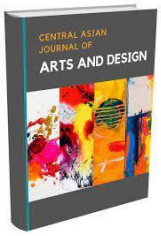

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Article

The Evolution of Urban Environment Restoration

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Abstract: The significance of the development trend of urban environment restoration is closely linked with urbanization, climate change, ecological crisis and growing population in cities today. Cities are expanding at an accelerated pace, outpacing demography everywhere, but their development usually has negative impacts on the environment, widens social disparity and consumes excessive resources. The urban space is shaped by historical developments, economic progress, social requirements and new technologies primarily. Architecture and urban planning infrastructure are one of key mechanisms of this process, contributing to how cities should be look like and work. The emergence of cities in Uzbekistan has a history that is likewise closely related to this development. The purpose of this study is to understand the function and value of architecture-related urban infrastructure in the restoration of the city environment and its evolution. Urban restoration and development does in fact mirror the cultural, social and economic history of mankind. As a part of this the contemporary notions concerning architecture and town planning as well as their correlation with infrastructure and environment issues are studied.

Keywords: Urban Environment, Urbanization, Ecological Sustainability, Green Infrastructure, Urban History, Innovations, Transport System, Sustainable Development, Urban Economy.

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1. Introduction

Cities are the greatest social and economic creations in human history, being not only a mirror of modern life, but also reflect the taste of ancient times in terms of culture, architecture and urban design. The urban context development and redevelopment are of vital importance in architecture and infrastructural urban planning. These essential elements contribute to the realization of related goals such as ecological and economic sustainability of cities, high quality of life, meeting population needs, and a effective control over urbanization [1].

The renewal of the urban environment has not only include architectural and urbanistic design, but besides the modern technologies, social needs and ecological sustainability. Especially the creation of new architectural structures, transportation facilities and the need for keeping the ecological balance are some of today's key concerns [2]. This paper studies the evolutionary law of urban environment restoration, architecture and urban planning infrastructure transformation, and practical scientific measures for modern cities. The paper investigates the possibilities of some strategies in the field of architecture and urban design, considering their relation with ecological and social aspects to create a sustainable perception and liveable city. This is necessary to revitalize cities,

maintain the ecological balance, increase the quality of life and strengthen social integration [3].

Understanding the functionality and importance of architectural compositions and urban planning infrastructure in the rebirth of urban environment makes it possible to think over sustainable and progressive development methods for cities‟ and communities‟ growing needs [4]. Changes in the character of the city are induced by technological developments as well as social and economic transformations, natural (floods) and man-made catastrophes (wars), etc. Reconstruction of architectural and city planning environment is formed as a process on the basis of new tasks and requirements. Methods of urban planning, the ancient and modern up-to-date approaches to their decision, development of different kinds of technologies in cities (transport networks), solutionsin architecture for improvement of living conditions, interurban communications and eco-balance – become these factors extremely important [5].

2. Materials and Methods

The approach of the article: "Evolution of Restoration of Urban Environment on Repulic scale (in terms of Uzbekistan) in system of architecture and town-planning" is polyhedral, multidisciplinary. The methodology of the study is mixed, qualitative, and mainly quantitative in nature: it analyses from historical and current tendencies to determine how architectural works, urban planning or ecological sustainability have contributed to the transformation of cities. At the beginning, comprehensive literature review is performed to study existing theories, previous studies, and new technologies on urban development in general to analyze problems of cities within Uzbekistan due to high population density, poor infrastructure control and environmental concerns. Fieldwork and observation of contemporary urban rehabilitation are also carried out in selected cities/urban areas in Uzbekistan. The interviews with local urban developers, architects, and residents reveal the practical angles of transforming and restoring cities. Comparative studies are performed in order to assess how effective various practices of urban planning and their consistency with the sustainable development strategy. Furthermore, the study applies case studies of some Uzbek cities on how green infrastructure, smart city technologies and urban systems (like transport, waste) modernisation are changing that due to a pilot scale of interventions. These cases illustrate sustainable urban reclamation successes, as well as areas needing focus. The results are synthesized in order to provide recommendations on future urban planning policies and strategies to enhance ecosystem-wise sustainability as well as the well-being in Uzbekistan cities. This approach delivers 360 degree view of the transformation of urgan nature restoration while city rapidly enlarges and green system dynamically changes.

3. Results and Discussion

Analysis findings:The development of the restoration urban environment is a complicated and multi-dimensional process that has an impact not only on the technical, functional changes in architecture and city planning, yet also on ecological, societal and economic factors. This inquiry investigates how changes in city were mediated with historical, social and ecological backgrounds as well as the effect of architectural and urban planning infrastructure in both aspects. (Table 1).

Table 1. Analysis of the Evolution of Urban Environment Restoration.

Field	Key aspects to be analyzed	Description
Historical Areas	Ancient development of cities	Cities have historically been shaped by various

		factors, including political and social demands.
	Urban architecture and architectural monuments	In the past, cities developed as religious, cultural, and trade centers.
	Changes in Urban Planning	The Industrial Revolution, urbanization processes, and post-independence development.
Social Relations	Social relations between cities and communities	Maintaining social balance, living conditions, and the standard of living in urban planning.
	Ensuring social stability	Social equality, adaptation to population needs, and integration among residents in the urban environment.
	Population migration and urbanization	Population density growth, migration from rural to urban life.
Environmental Issues	Ensuring ecological sustainability	Reducing the ecological footprint of cities, creating green infrastructure, and using resources efficiently.
	Environmental protection and natural resource management	Energy saving, waste reduction, and ensuring ecological sustainability.
	Restoration of green zones and natural ecosystems	Creation of green spaces, tree plantations, parks, and natural reserves in cities.
Architecture and Urban Planning	Modern trends in architecture	Green architecture, high technologies, and environmentally and socially adaptive designs.
	Changes in urban infrastructure	Green architecture, high technologies, and environmentally and socially adaptive designs.
	Smart cities concept	Managing urban infrastructure through information technologies and efficient resource distribution.

Economic Interrelation	Interrelation between cities and economy	Development of cities as economic centers and the creation of new jobs.
	Economic approaches for city modernization	Economic reforms, development of new industrial sectors, and renewal of urban infrastructure.
	Tourism and its impact on urban economy	Developing tourism and generating additional income for urban economies.
	Smart transport systems and ecological structures	Innovative transport systems, electric vehicles, sustainable energy sources, and other technologies.

Urban environment re-functioning process: the given mechanism, without which it is impossible to imagine urbanization or social and economic life, ensures natural properties of cities, quality of a social life and reliability of infrastructure systems. Urban recovery and restoration Architecture and urban planning are essential in an urban rehabilitation [6].

Problem: When studying restoration of the urban environment and processes of urbanisation in Uzbekistan, some of the main problems are as follows. These issues are not exclusively about city living conditions, but they pertain to the ecology and society as a whole. The major problems influencing the urban environment in Uzbekistan are given as follows:

The population density in the cities is growing in Uzbekistan while this leads to a lot of problems such as housing shortage, transportation problem and infrastructure inadequacy [7].

– People from rural areas moving to town, migration from village to city and the economic disparity between towns and villages;

Decline in living conditions, lack of infrastructure and deterioration of environmental pollution [8].

Towns are confronted with environmental challenges such as air pollution, inadequate handling of waste and the loss of green spaces. Factories and cars, as well as building things also pose big environmental problems.

Urban infrastructure systems (transport, water supply, sewage, electricity supply) are inadequate. This is an issue because the population of cities are growing quickly.

Cities are divided in terms of economics and society, there is a shortage of talent, and issues exist around education and health. Meanwhile, the population is accompanied by the social inequalities in urbanization (Table 2).

Table 2. The main problems and their descriptions in the process of restoring the urban environment and urbanization in Uzbekistan are presented in the table.

Problem	Description	Causes	Impacts
Population density and urbanization	The population density in cities is increasing, which leads to a lack of living	Migration from rural areas to cities, an increase in jobs in cities.	Deterioration of living conditions, lack of

	conditions and infrastructure.		infrastructure, and increased environmental pollution.
Environmental problems	Environmental problems such as air pollution, lack of waste management, and reduction of green areas.	The increase in cars, industrial development, and improper urban planning.	Air pollution, improper waste disposal, and shrinking of green areas.
Lack of urban infrastructure	Outdated transport systems, water supply, sewage systems, and other infrastructure systems.	Aging infrastructure, lack of investments, and failure to create necessary infrastructure for new cities	Poor transport systems, insufficient sewage and water supply.
Social problems and inequality	Economic and social differences between cities, lack of skilled workers.	Economic disparities between cities and rural areas, issues in social policies.	Social segregation, inequality in education and healthcare, difficulties in eliminating differences.
Delay in the development of smart cities	Underdevelopment of the smart cities concept and lack of information technologies	Underdeveloped technological infrastructure, lack of specialists, insufficient investments.	Inefficient city management, ineffective use of resources, lack of infrastructure integration.
Economic development	Underdevelopment of industries in economic centers, slowdown in job creation.	Low development of industrial sectors, difficulties in modernizing technologies.	Increase in unemployment, widening economic gap, low efficiency of city economies.

The problems presented in the table illustrate the existing challenges in the restoration of urban environment and urbanization as well as the infrastructure of Uzbekistan. Addressing these challenges will require holistic solutions [7].

Solution: The actual solutions for rebuilding our cities, and specifically for architecture and urban infrastructure are complex and are based on several factors. This problem, however, must be faced from several fundamental perspectives and strategies. Answers need to be multi-disciplinary, i.e. ecological, economic, social and technological measures are decisive at the same time [8].

Ecological sustainability and massive application of green architecture concepts play a vital role in urban recuperation. The following can be measures to address this:

Green infrastructure: Building parks, gardens and green spaces throughout cities, adding plants to rooftops. This is essential not just for ecological sustainability but also to promote human health and community cohesion.

Energy use: How and where we get energy from, including how our neighbours produce their own.

Permeable devices: integrating permeable technology (such as porous brick) in urban construction, which could make water infiltration increase and sewage system pressure lighter [9].

Outcome: Restoration of the urban environment is a specific process as "the actual management, both physical and social, of the city to create better living conditions in existing built-up areas". Urban recovery is also the result of good architecture and infrastructure. This includes both new technological methods and innovative production process and the ecology of sustainability. A systemic approach including construction, transportation, energy supply, environmental protection and social environment improvement must be developed for urban restoration [10].

The development of urban environmental restoration can be divided into different phases, where the building component of urban infrastructure is emphasized. It is expected to use smart city technologies for urban governance. These are cities that work on the basis of information technologies and IoT (Internet of Things), controlling transport, energy supply and city governance as a whole in an effective manner." (Fig 1).

Figure 1. Development plan of Tashkent city's master plan until 2045.
https://www.norma.uz/novoe_v_zakonodatelstve/razrabotan_generalnyy_plan_tashkenta_do_2045_goda

The main objectives of developing a master plan are:

- Regulation of procedures to obtain construction permits;
- Organising the engineering and transportation infrastructure of the city, population density requirements and overall planning;
- Protecting the city's green and health protection belts, cultural inheritance GemeindegrenzenBlevig medicine/Trade [11];
- Setting guidelines for economic and social development to the period of time which is necessary for satisfying present and future needs of the population [12].

The master plan has important instruments, comprising indicators whose maps are recorded in urban planning cadastre of Ministry of Construction and HCS as open data [13].

Green infrastructures and ecological design help improve the overall ecology of cities. Green zones, open spaces and gardens etc.are of great importance in urban ecology.

Energy-efficient building materials and renewable energy sources are applied to maintain the urban planning development with an energy saving pattern [14].

In addition, technology developments and smart city concept are contributing a lot to realize cities as modern and sustainable. The development of ecologic recovery for urban environment is not only to protect natural environment, but also restore social balance which create chances for urban residents to realize high-quality and rich life [15].

4. Conclusion

For the development of restoration practice for the urban environment in architecture and city construction a complex, multilevel approach is necessary. The successful development of cities can only be achieved with the harmonious combination of ecological sustainability, intelligent technology, social equity and economic prosperity. The application of these principles in Uzbekistan's cities will not only result in the provision of better quality urban environment, but also have a meaningful impact on the country as a whole.

Yes: C Advanced technologies, intelligent system and production capability are the basis of in city construction. Novel strategies and maintenance of ecological soundness are important in the abatement urban deprivation.

Urban environment restoration is the development of an urban function of human settlement that is committed to the sustainable ecological, economic and social development of cities. This is a nature restoration in the urban network infrastructure work, creating green space, conserve natural resources and improve quality of life for residents.

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