
TITLE: HOUSING CONSTRUCTION IN TASHKENT, UZBEKISTAN: A HISTORICAL OVERVIEW AND THE NEED FOR SUSTAINABLE DEVELOPMENT

MAIN QUESTION: HOW HAS THE HISTORY OF HOUSING CONSTRUCTION IN UZBEKISTAN BEEN SHAPED BY FACTORS SUCH AS CLIMATE, POPULATION GROWTH AND CULTURAL TRADITIONS, AND WHAT ARE THE EFFECTS OF UNCONTROLLABLE URBAN GROWTH?

Keywords: Residential buildings' evolution, past-present comparison, population growth, corruption, post-earthquake construction, environmental impacts, thermal control, health & safety impacts,

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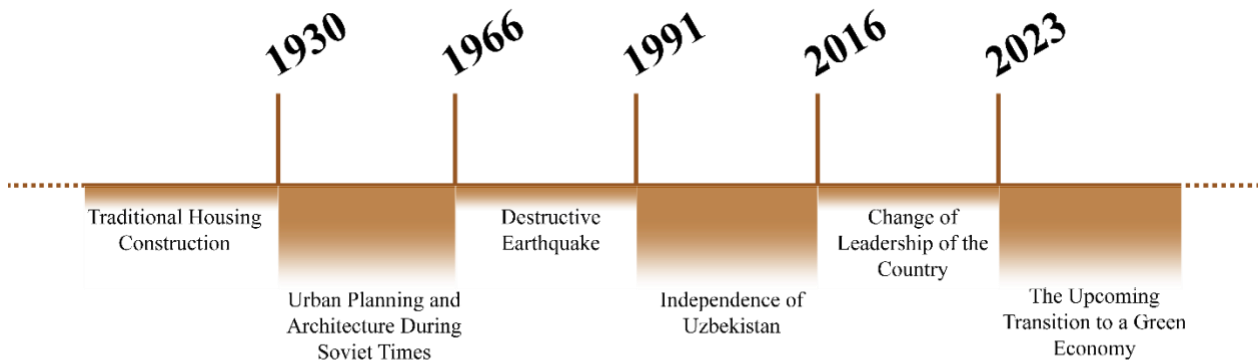
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TABLE OF CONTENTS

TIMELINE.....	2
ABSTRACT	3
INTRODUCTION.....	4
TRADITIONAL HOUSING CONSTRUCTION	5
URBAN PLANNING AND ARCHITECTURE DURING SOVIET TIMES.....	8
DESTRUCTIVE EARTHQUAKE	11
INDEPENDENCE OF UZBEKISTAN	16
CHANGE OF LEADERSHIP OF THE COUNTRY	17
THE UPCOMING TRANSITION TO A GREEN ECONOMY	20
CONCLUSION.....	21
APPENDIX A (GRAPHS)	22
APPENDIX B (INTERVIEW).....	23
RUSSIAN (ORIGINAL):.....	23
TRANSLATED (ENGLISH);.....	29
REFERENCES	35
BIBLIOGRAPHY.....	37

TIMELINE



ABSTRACT

The purpose of this dissertation is to investigate the sustainability and environmental impacts of residential structures in high population growth cities, with a focus on Tashkent, Uzbekistan as a case study. The study will provide a past, present, and future analysis of changes in Tashkent's residential infrastructure as well as the environmental risks associated with higher and denser residential structures. The study will also look at how building design in Uzbekistan has changed over time and the reasons for these changes. The dissertation also includes an interview with an Uzbek civil Engineer that can be found in the appendix below.

INTRODUCTION

Within recent decades many cities with a high population density have been significantly impacted by the changes in the infrastructure of residential properties. The need to accommodate a growing population while also efficiently utilising the land around them has forced residential structures to increase in height to support more people within each plot of land (Saidov, 2021). The changes in the style of building have risen concerns about their environment. Urban planners, policymakers, and researchers now consider the long-term sustainability of these developments, as well as their compatibility with the local environment, to be crucial issues (Database, 2022)

Uzbekistan is a country located in Central Asia, bordered by Kazakhstan, Turkmenistan, Tajikistan, and Afghanistan (Sinor, Allworth, & Hambly, 2023). Due to factors such as population growth, urbanisation, and modernization, the residential infrastructure of Tashkent, the country's capital, has seen major changes throughout recent decades (Obidovich, 2022). These changes coupled with the lack of building standards and inadequate attention to environmental issues have created and exacerbated multiple adverse effects within Tashkent, these affect can be seen within the environment and around the capital (Holmatov, 2023).

Tashkent's weather is categorised as hot and dry, with long, hot summers and brief, mild winters (Boymatov, Allambergenov, Samiyeva, & Asemetov, 2023). When designing buildings within Uzbekistan the environmental effects must be considered within the design stage, one of the main difficulties within Uzbekistan is the necessity to provide sufficient cooling systems and insulation to maintain suitable temperatures within buildings to create sustainable living conditions. Even with the extreme conditions that need to be considered the lack of environmental considerations during the building phase of buildings has created detrimental effects on the environment and human health (Holmatov, 2023)

Historically, locally produced materials such as adobe, mud bricks, and clay bricks were used as the main materials within residential structures in Tashkent (Graph 2, Appendix A). However, the growing population and the cities urbanisation have coursed a change within the materials utilised for the new buildings. To create taller buildings that can support a denser number of people within it more durable materials need to be sourced like concrete and steel (Mavlyanova, Inagamov, Rakhmatullaev, & Tolipova, 2004) which need to be installed on top of large foundations and have numerous pipes, wires and concrete expanding past the buildings walls. Unfortunately, a lack of building rules has resulted in dangerous building techniques where homes are being built too quick and without consideration for the areas around them this has led to issues with the sewage system, poor air quality, and other environmental challenges and overall inadequate infrastructure.

This dissertation aims to contribute to the understanding of the difficulties and opportunities of sustainable urban development within high population growth cities while also addressing the detrimental effects of inadequate building regulations and ignorance. This dissertation will investigate the past, present, and future of residential infrastructure in Tashkent.

Traditional historic houses within Uzbekistan were referred to as folk houses. These homes were created by individual families and responded to the needs and material capabilities of each family. The design of the houses was often influenced by the economic, religious, and natural-climatic conditions of the area the families were located within. When building their homes, most their attention while planning the structure was focused on protection against overheating.

With the main regions of the country consisting of hot and dry zones air temperatures would often reach 45°C in summer. Multiple measures and techniques were used within the architecture of these buildings to help combat the overheating issues.

Many civil building projects of that era often found that high vertical ventilation systems would disperse the hot air and allow the inside of houses to remain comfortable even at 40°C air temperatures. The vertical ventilation of summer rooms was ensured by long closed passages on the first floor, with a staircase connecting common ventilation systems, as the hot air would rise from the corridor into the stairway to help disperse the heat evenly (Boymatov, et al., 2023)

In conjunction with these many homes would coat the inner walls, which were made of mudbricks with a layer of clay (Fig. 1). This layer of clay would often be sprayed with water to help cool the air as it passes through the walls and would also help regulate humidity levels. However, due to the low economic status of Uzbekistan the location of the buildings would often determine what material could use, due to locally sourced materials often being cheaper. Therefore, more stone was used in mountainous areas, whereas wood would often be used in forest conditions, brick, cotton wool and other local constructions in areas where the soil is not saline (Boymatov, et al., 2023). This means that not all the homes were able to create their inner walls with clay and mud bricks.

Many traditional houses would incorporate a general theme amongst their architecture which was to incorporate a central open-air court yard in the centre of their homes and surrounding it with rooms on all sides (Fig. 1). With large openings within each room allowing air to flow through the windows and rise which created a vacuum at the bottom of the court yard that would draw in cooler air from the outside. Attempts were made to make the doors and windows of the houses smaller and the walls thicker to help retain the cooler air that was being drawn out (Osarov, 2022). Over time these courtyards became the main attractions of these homes and thus the maximisation of the courtyard was also considered when planning these buildings.

The courtyards and houses have been built together since ancient times in numerous historical cities such as Bukhara and Khorezm. Many of these cities would divide their courtyards into two parts the inner and outer (Fig. 2) courtyards (Osarov, 2022). These courtyards were often used as locations for families to set up trading platforms, Inner court yards were primarily used by the females of the family to manufacture products and were then transferred to the outer court yards where the males of the family would sell the manufactured products.

The rooms surrounding the courtyards were built with the facades primarily facing north and south. The north facing side of the house was built on a higher foundation and the south facing side of the house was built on a lower platform (Fig. 3). The upper platforms were often used as a summer house, open windows

and doors were often elevated to take advantage of the prevailing winds to help maximize airflow. Whereas the lower platforms were known as the winter house, these were located on the south side of the homes and were designed to have thicker walls and smaller windows to help the rooms stay more insulated and retain the trapped heat inside. They were often located closer to the courtyard, which would help to keep them warmer by trapping the sun's heat from that day. This allowed the occupants to move between the two houses depending on the season, ensuring that they would be comfortable all year round (Osarov, 2022).

Because of the precautions taken to combat the natural climate, building structures and housing plans have been optimized to be protected against outside elements. During the winter when temperatures drop the courtyard would be closed off and allow the homes to trap heat with itself and the clay walls were left dry (Osarov, 2022), whereas in the summer the windows would be left open within the summer houses to maximize airflow and disperse heat.



FIGURE 1. TRADITIONAL UZBEK HOUSE WITH A COURTYARD. INNER WALLS MADE OF MUDBRICKS WITH A LAYER OF CLAY.

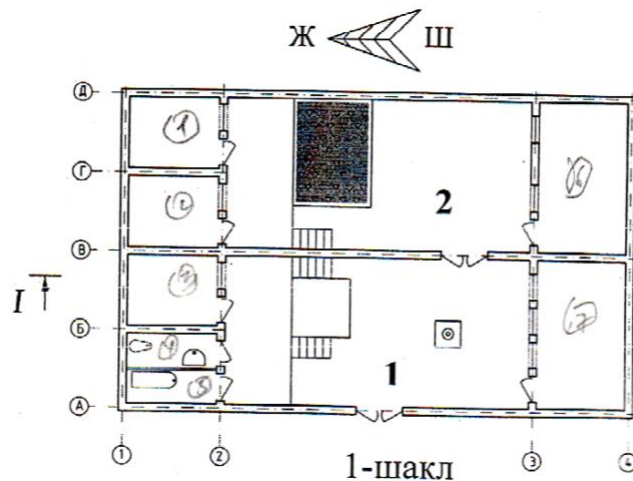


FIGURE 2. OUTER (1) AND INNER(2) COURTYARDS USED FOR MANUFACTURING AND TRADING

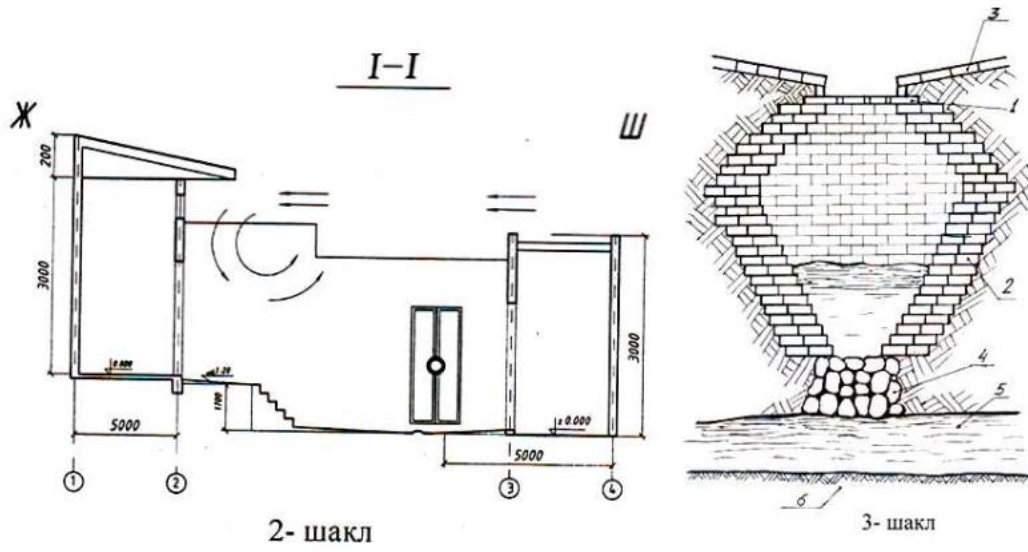


FIGURE 3. SUMMER AND WINTER HOUSES OF TRADITIONAL HOMES



FIGURE 4. EXTERIOR OF KHIVA APPARTMENT HOUSE.

URBAN PLANNING AND ARCHITECTURE DURING SOVIET TIMES

Tashkent was originally an old city located close to Silk Road, which was a network of trading routes that spanned across Asia, connecting China and India to the Middle East and Europe. In 1865, Russian forces captured Tashkent and overtook their government becoming their new rulers. Russia and subsequently the Soviet Union immediately began construction of a more modern city alongside the native one. (Jeff Sahadeo, *Russian Colonial Society in Tashkent, 1865–1923*. (Bloomington, IN, 2007)).

Between the capturing of Tashkent and the start of World War I in 1914, the Russians had already constructed numerous monumental structures. The construction of these structures diverted essential resources away from the native citizens of Tashkent and things like infrastructure of cities and housing became a prevalent issue within the capital.

The effects of this were felt heavily at the start of World War I. Tashkent received a massive influx of refugees from across the Soviet Union. Amongst these refugees there were numerous skilled laborers and scientists. As the war ended many of these refugees stayed within Tashkent which led to further technological developments within the city, most notably there was a large-scale aviation plant. These technological advancements allowed Tashkent to produce enough money to where they could house the new population.

However, during the World War II, there was another influx of refugees entering the cities walls which has cause radical changes to Tashkent. After the War has ended, Tashkent, along with the other Soviet cities, faced an overwhelming challenge in producing adequate housing for the city's post World War II population. Numerous buildings were being constructed at the end of the second war and the goal was to provide adequate housing for everyone by 1970s, however in 1966 a 7.4 earthquake destroyed many of the newly constructed homes leaving Tashkent in ruins (Fig. 5) (Stronski, 2012).



FIGURE 5. AFTERSHOCKS OF THE DESTRUCTIVE EARTHQUAKE DESTROY MORE HOUSES.

Soviet architects saw the earthquake as an opportunity to remodel the city (Fig.6), efforts were made to create new building codes that consisted of buildings being created by reinforced concrete to help reduce the aftereffects of the next earthquake. Alongside the changes within the building regulations a more diverse set of industrial facilities were created in Tashkent to help pay for the construction of these sites, these decisions benefited both the people and the state. (Stronski, 2012)



FIGURE 6. VISITORS SEE A PLAN FOR THE RECONSTRUCTION OF THE CENTRE OF TASHKENT, 1968.

However, many of the housing projects constructed were unsuited to the hot climate of Central Asia, and the constructed apartments that were built did not take into consideration the Uzbeks family structure, which tended towards bigger and extended families, all living within the same house. After the death of Stalin in 1953 many of the native population presented more realistic proposals for the city which was comprised off more locally suited housing projects. These projects were rejected by the Moscow-based architects, who proceeded to use only one common standard for housing projects in the entire Union. These architects rarely visited Tashkent and stated that ‘Cities were not supposed to suit the customs of the inhabitants; inhabitants were supposed to transform their customs to suit the new Soviet city’, Stronski illustratively points out (p. 223). (Stronski, 2012)

This inflexible ideology from the Tashkent architects and governing soviets lead to additional problems. For example, with a lack of motivation many of the constructed buildings suffered from poor workmanship and a lack of good coordination and management. Many of the new buildings were constructed without adequate water and gas lines going into them and would not have them fitted until years after the construction of the property. This lack of quality within the construction of soviet buildings led to Tashkent having the highest percentage of people living on private land in the Union, 85% of which lived in one-

storey buildings which caused the native population of Tashkent to be the main perpetrators of the expansion of Tashkent.



FIGURE 7. A GENERAL VIEW OF THE NEW RESIDENTIAL BUILDING WITH 110 APARTMENTS, WHICH IS BEING GIVEN TO THE FAMILIES OF TASHKENT RESIDENTS WHO SUFFERED FROM THE EARTHQUAKE.

Authorities largely failed or were inadequate in providing housing for the city's population and ignored numerous environmental factors when designing these homes. This became very evident in 1966 when an earthquake destroyed 78,000 homes. (Stronski, 2012)

Despite the poor housing constructions, soviet Governors paid a strong attention to the improvement of the city's green spaces and irrigation systems (aryks). There were multiple orders on planting the trees, which were taken care of this whole time, although were cut down around 10-15 years ago (Holmatov, 2023). On the picture below (Fig. 8) there is an example of Amir Temur Square (ex-Revolution Square).

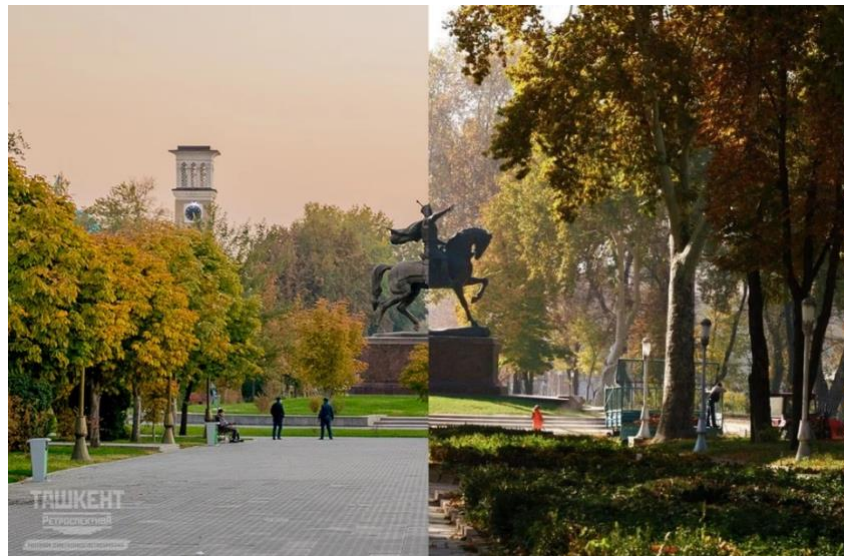


FIGURE 8. AMIR TEMUR SQUARE, BEFORE (RIGHT) AND AFTER (LEFT).

DESTRUCTIVE EARTHQUAKE

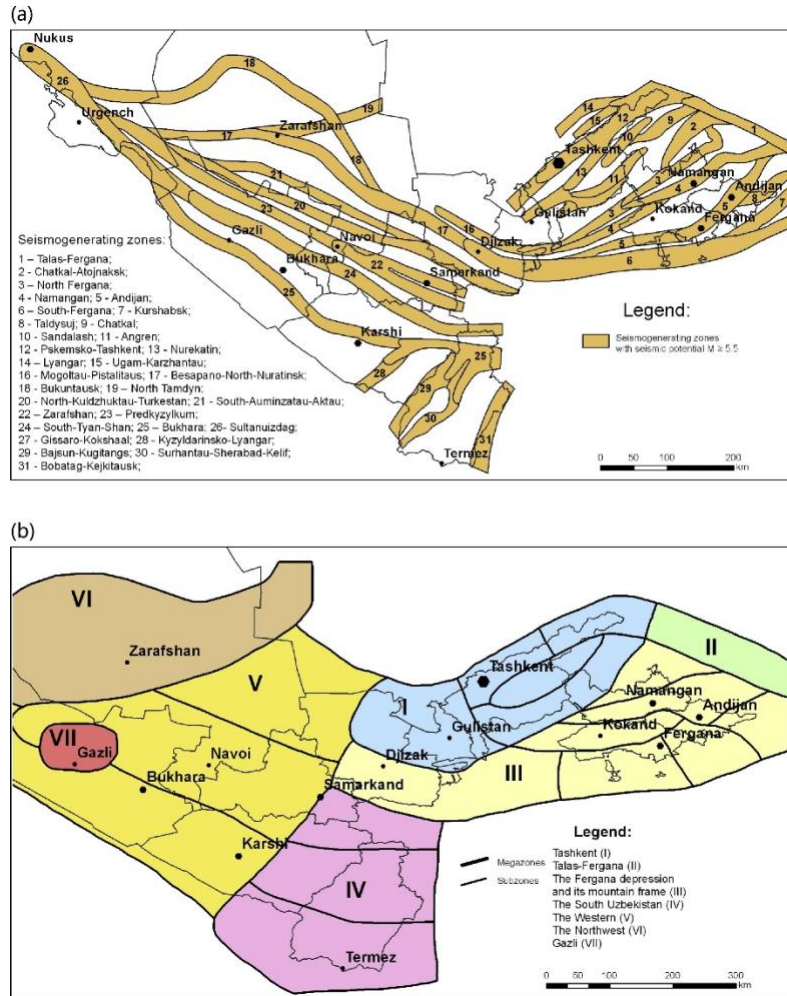


FIGURE 9. THE SEISMIC SOURCES USED FOR SEISMIC ZONING OF OSR-2017 IN UZBEKISTAN: A) SEISMO-GENERATION ZONES; B) AREAS SOURCES.

Uzbekistan is located on the Asian continent in between the Eurasian tectonic Plate and the Indian-Australian tectonic Plate. In addition to this Uzbekistan is located near several fault lines, including Tashkent Fault and the Ferghana Valley Fault, this region is known as the Alpid Belt. The area is characterized as high seismic conditions. (Mavlyanova, et al., 2004)

Earthquake hazard is often expressed in terms of seismic intensity and measured on the Richter scale, which is a quantitative description of the intensity of the earthquake. However, during the former Soviet Union, seismic intensity was measured on a 12-step scale, called the Medvedev-Sponheuer-Karnik (MSK) scale with 1 being the weakest and 12 being the strongest. This is similar to the Modified Mercalli Intensity scale used in the United States and Europe (Mavlyanova, et al., 2004).

Considerable part of Uzbekistan is located within high seismic intensity zones averaging a 7 on the MSK scale. However, the areas with a higher population density being its eastern and south-eastern parts of the country, where large cities and the capital-city Tashkent as well as numerous industrial units are located, fall into zone averaging an intensity of 8 and 9 on the MSK scale. There are many cities such as Tashkent, Samarkand and Bukhara that have experienced seismic intensity between 1976-1986. More than ten violent and destructive earthquakes with varying magnitudes 5.5-7.3 on the MSK scale took place (Fig.11) (Mavlyanova, et al., 2004)

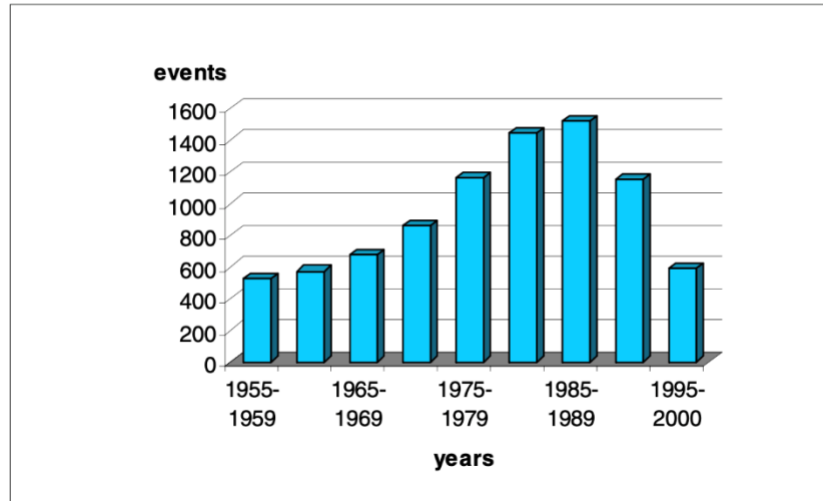


FIGURE 10. EARTHQUAKES IN UZBEKISTAN WITH MAGNITUDE FROM 2,5 TO 7,5 FOR PERIOD 1955-2000 YEAR.

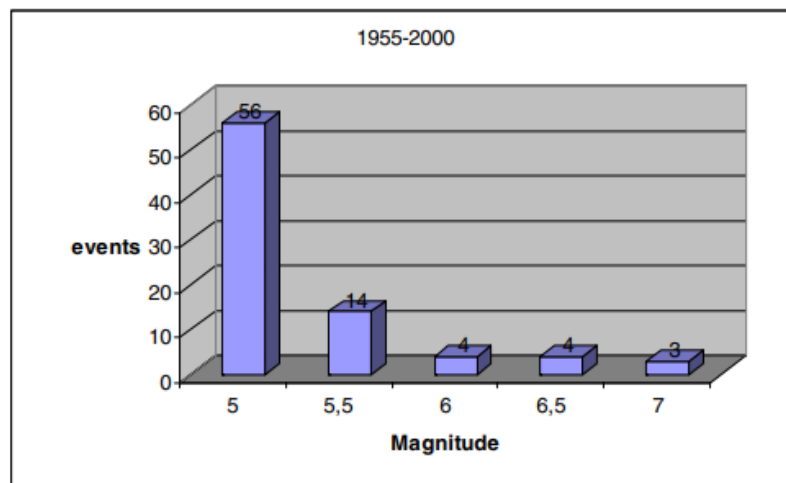


FIGURE 11. EARTHQUAKES IN UZBEKISTAN WITH MAGNITUDE MORE THAN 5 (M>5), FOR THE PERIOD 1955-2000

In 1966 Uzbekistan experienced one of the most devastating earthquakes in history, reaching a 7.5 on the Richter scale. The epicentre of this earthquake was located 80 kilometres away from Tashkent. Around 78,000 homes were destroyed (Fig. 12) which resulted in 300,000 people were left homeless after the destruction caused by this earthquake. As a result, around 200 people lost their lives (Stronski, 2012).

Shortly after this The Institute of Seismology of the Academy of Sciences of Uzbekistan was established to monitor the seismic activity within the country to help create procedures on how to recover from these earthquakes. In present time, the Institute of Seismology has collected data from almost every earthquake above a 2.5 magnitude on the MSK scale between 1955 – 2000 which totalled in 8630 events (Fig.2) (Mavlyanova, et al., 2004)



FIGURE 12. UZBEK HOUSES DESTROYED BY AN EARTHQUAKE IN 1966.

After the dispassion of the Soviet Union in 1991 Uzbekistan became the independent country. The newly formed government of Uzbekistan were aware of the seismic threat and had taken certain steps to help earthquake disaster preparedness. One of these measures was to create a law to protect the population and local territories from emergency situations of earthquakes.

The law was passed on August 20, 1999, and created a new seismic code. These laws were “KMK 2.01.03-96” which created regulation for construction of buildings within seismic zones and KMK 2.07.01-94 which focused on town planning, lay-out and building of urban and village settlements to create safe areas of

retreat within these zones. These operations were worked on by the State Committee for Architecture and Construction. These laws were implemented by constructing and reinforcing original buildings within areas which averaged seismic intensity of a magnitude greater than 7 on the MSK scale and provided safety designs and safe areas for the people when an earthquake hit (Mavlyanova, et al., 2004).

The newly constructed buildings would need to abide seismic code to improve the seismic stability of buildings and increase of the resistance to seismic movement (Mavlyanova, et al., 2004). The seismic code consists of 6 sections which provide guidance of different aspects of construction and how to construct different types of buildings in these high activity zones:

1. SNiP 2.01.07-85 - This code provides guidelines on how to design buildings in earthquake-prone areas. It covers everything from construction materials to the structural design and soil analysis to help create sturdier foundations.
2. SNiP II-7-81 - This code establishes seismic requirements for residential buildings that are up to three stories high. It provides guidelines for structural elements such as walls, floors, and roofs, as well as where these elements need to be connected and placed.
3. SNiP II-15-80 - This code sets out seismic requirements for industrial buildings and structures that are over three stories high. It covers various types of structures, including storage buildings, industrial factories, and electrical power plants.
4. SNiP II-22-81 - This code provides the seismic requirements on how to construct bridges, tunnels, and other transportation-based infrastructure. It covers design elements such as the foundations of these areas.
5. SNiP II-23-81 - This code establishes seismic requirements for hydraulic based structures, such as power generating dams and water treatment plants. It covers design elements such as the foundation, where to lay the waste lines, and the water gates.
6. SNiP II-25-80 - This code sets out the seismic requirements for special structures, including high-rise skyscrapers, hospitals, and schools. It covers design elements such as structural systems, foundations, and building materials, these areas need to be highly reinforced to keep the people inside safe due to the buildings being high risk locations.

Overall, these seismic codes were designed to ensure that buildings and structures within Uzbekistan are designed and constructed to withstand a variety of earthquakes of varying intensity. In the Table 1 there is a table to show how the materials used within these construction sites are affected by a varying level of seismic activity. This table was used in conjunction with the seismic codes to help select the optimal materials for each building. By following these codes construction companies can help to minimize the

risk of earthquake damage and protect the safety of occupants. The enforcement of these design rules is under the responsibility of the general state expert commission. The monitoring of construction is carried out by the architectural supervision of design organisations, technical service builders, and the General Architectural-Building Inspection of the State Committee for Architecture and Construction (Mavlyanova, et al., 2004)

STRUCTURAL TYPE	DAMAGE LEVEL		
	MSK VII	MSK VIII	MSK IX
1. Unengineered structures, including small adobe and unreinforced masonry buildings	Heavy damage	Partial to total collapse	Total collapse
2. Brick bearing-wall systems with wooden floors, one to two stories, pre-1955	Moderate to heavy damage	Partial collapse	Total collapse
3. Brick bearing-wall systems with precast reinforced concrete (RC) floors, three to five stories, pre-1957	Slight to moderate damage	Heavy damage to partial collapse	Partial collapse
4. Brick bearing-wall systems with precast RC floors, some seismic detailing, post-1957	No damage to slight damage	Moderate to heavy damage	Heavy damage to partial collapse
5. Precast RC frames with welded joints and brick infill walls, four to nine stories	Slight damage	Moderate to heavy damage	Heavy damage to partial collapse
6. Precast RC large-panel systems with dry or wet joints	No damage to slight damage	Slight to moderate damage	Moderate damage

TABLE 1. CENTRAL ASIAN STRUCTURAL TYPES OF RESIDENTIAL BUILDINGS AND EXPECTED DAMAGE LEVELS.

INDEPENDENCE OF UZBEKISTAN

On August 31st, 1991, Uzbekistan declared its Independence from the Soviet Union and a new president was elected who was the government official between 1991 up until his death in 2016. Due to this change in leadership, the population of Uzbekistan remained relatively stagnant over a 25-year period (Fig.13) because of the new laws set in place making it extremely difficult for people to immigrate into the country by making it virtually impossible to obtain residential permits within the country (Canada, 2016). This lack of immigration and tourism into the country closed the country off to the rest of the world.

Over this 25-year period after Independence the construction industry didn't develop much due to the lack of population increase (Holmatov, 2023). Families would often live the same houses for generations and wouldn't need to obtain a new ones. Due to a lack of growth within the construction industry it became a less profitable industry. One company was able to monopolize the construction industry because of the lack of competition, this company was known as Gabus. Alongside Gabus a couple of commercial banks also created residential buildings as investment properties (Holmatov, 2023).

No need in residential properties led to the government focused mainly on maintaining social and environmental aspects of the country over this 25-year period. They improved and maintained a smart irrigation and water supply system, named "aryk". Aryk was created to provide water for drinking and domestic use and also handled sewage and major constituents of the urban water supply system. These sewage systems would span across the whole city of Tashkent and contributed greatly to the creation of microclimates reducing the heat of the area around them and the creation of small unique oases in urban surroundings, creating recreation-parks, "khauz", and others similar areas ("khauz" in the Uzbek language means a pool or basin where water was stored temporarily for later use) (Rakhmatullaev, Kazbekov, & Bazarov, 2003)

Due to this irrigation system Tashkent was continuously supplied with water circulating the city that provided enough water within parks to form large trees and parks that would help improve the air quality of the surrounding area, these trees would also provide shade for the local area around them which would reduce the temperature of the environment around them.

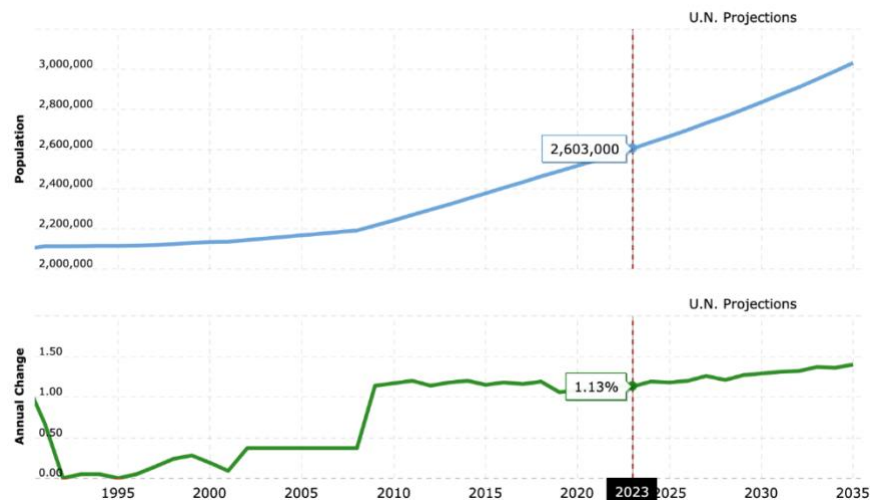


FIGURE 13. POPULATION OF TASHKENT, UZBEKISTAN, THROUGHOUT THE YEARS.

CHANGE OF LEADERSHIP OF THE COUNTRY

After the death of the first president since the independence of the country there was a change in leadership, where another government official had taken over and became Uzbekistan's second president. This change in leadership came with various new policies that had been introduced, these policies pushed Uzbekistan into a new dynamic phase of development, which led to a rapid urban growth.

According to Turaeva before 2016, registration for a permanent residence in Tashkent was "almost impossible" (Turaeva, 2016). Furthermore, according to the Uzbek German forum (UGF) even relatives of Tashkent homeowners are not able to register their relatives "by lawful means" (Agostini, Weijen, & Mantovanelli, 2023). The change in leadership within the country simplified the registration systems with the hopes to increase revenue generated by immigration, migration and tourism, simplification of the registration process caused a large influx of migration into the capital city of Tashkent. They had replaced the old system with a new one, with the main condition for migration into the capital was to have a permanent residence in your name.

Due to the growing population within the capital city, there was an increase in the demand of residential buildings, this caused the government to give permission to numerous construction projects around the capital. This increase within the construction industry provided more job opportunities for the country and further caused a large migration into the capital city, and with the simplified registration, workers began to move entire families into the capital city.

The population increase and subsequent urbanisation was not the only reason for a massive increase in building constructions. Due to economic developments of the country the GDP of the country had increased, people became wealthier and began to create larger and more luxurious homes. Families would split apart with some creating larger homes to take care of the elderly members within and others would move closer to the city centre to reduce their commute time to work further increasing the housing and construction demand.

These factors caused an increase in demand within the construction industry, and with Gabus already having a monopoly over the industry it allowed them to become very profitable. These factors have led to the rapid urban growth. Despite the positive economic changes of urbanisation, it is necessary to analyse both the advantages and disadvantages of the construction and development of Tashkent.

There were numerous social and economic benefits to the changes in leadership. Due to factors such as the increase in jobs available and the increasing influx of skilled workers, the average income per capita within the city had increased (Data, 2017). The simplification of residential families allowed families to stay together and not separate, and the new laws around migration into the city created a continuous demand for housing within the city, improving the construction and real-estate markets. The average house price between 2016 and 2023 in Tashkent had increased (Table 2), which further strengthened the economy for the people already living there. (Historical Prices in Tashkent, 2023)

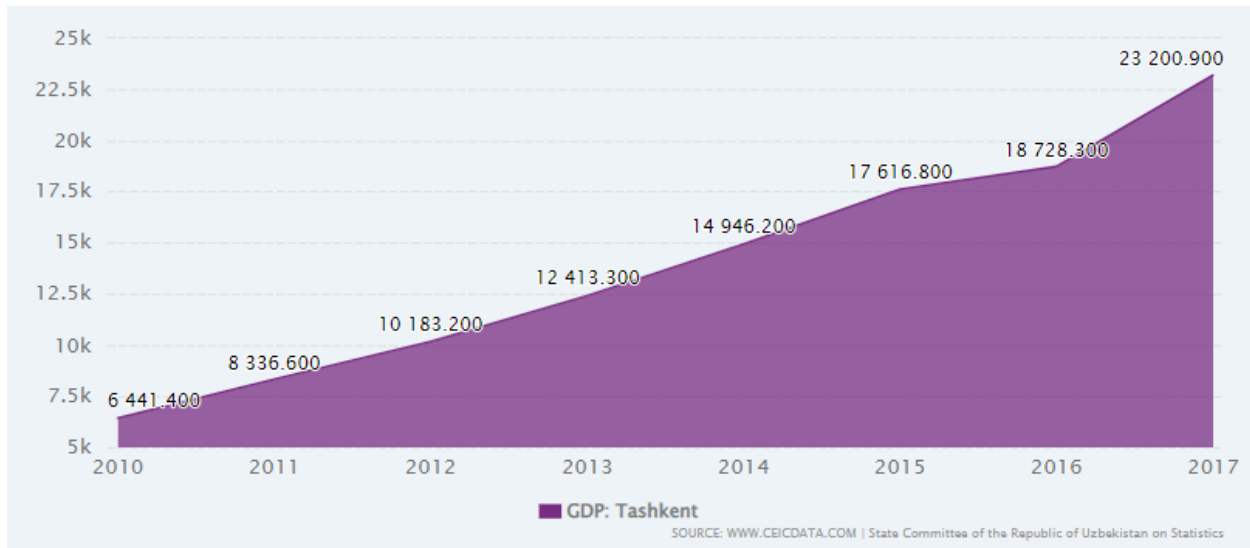


FIGURE 14. UZBEKISTAN GDP: TASHKENT FROM 2010 TP 2017

Buy Apartment Price

Year	Price per Square Meter to Buy Apartment in City Centre	Price per Square Meter to Buy Apartment Outside of Centre
2022	1177.33	618.14
2021	1268.41	596.60
2020	1100.00	541.67
2019	951.67	475.21
2018	857.14	400.00
2017	-	-
2016	-	-
2015	1089.25	-
2014	1364.29	760.71

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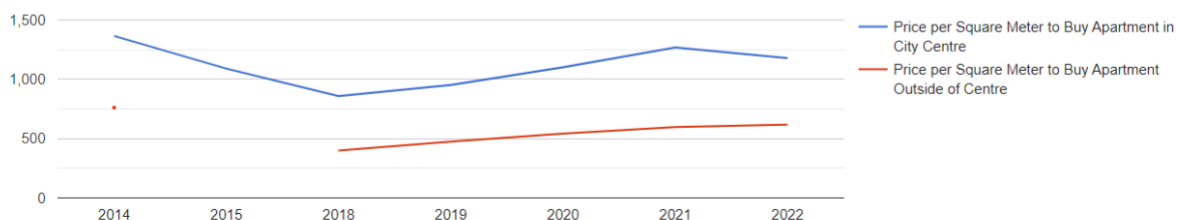


TABLE 2. PRICES PER SQUARE METRE TO BUY APPARTMENT IN TASHKENT.

However, there were numerous negative environmental factors that this rapid urbanisation had created. As the construction industry became more profitable and the demand for housing increased which allowed numerous construction sites to simulations take place which polluted the local community, many environmentally friendly areas like parks were replaced with large residential properties and trees were cut down to create materials and space for these projects. The construction industry had become out of control, severely affecting environment, and subsequently the public's health. In a recent interview conducted with Ilkhom Holmatov, an Uzbek civil engineer, numerous issues within the current residential construction industry were uncovered. Transcripts for this interview can be found in (appendix 1).

Firstly, the construction industry is focused on making profits, the way they do this is by creating large residential blocks for people to move into. According to Holmatov, there is little to no urban planning for Tashkent, this provides companies a financial incentive to tear down and replace nature reserves like parks, and forests with large housing units which has started to create a chaotic urban expansion (Holmatov, 2023). The lack of planning has allowed many properties to be created too close to the cities irrigation and sewage systems which has begun to disrupt them in numerous areas along the sewage lines, this disruption has caused them to consistently overflow. The increase in construction sites has begun to pollute the air with dust and fumes from the construction sites and with the lack of trees to help filter and catch the pollutants the air quality of Uzbekistan has drastically decreased and is currently on the 20th place of worst air quality in the world (Air, 2023) and has caused an increase in the frequencies of dust storms. The cleanliness standards of construction sites are not being strictly controlled, as all the upcoming issues are being dealt with through bribery. The increase in the number of buildings has had a direct effect on the air temperature, these buildings and roads are absorbing and retaining the sun's heat continuously heating the environment around them, and with the lack of trees to provide shade for these buildings the air temperatures will continuously rise within the city (CABAR.asia, n.d.) Holmatov stated that: Although the new trees are being planted to replace the old ones that have been cut down, those that still don't have the same effect as the massive old trees used to have (Holmatov, 2023).

However, there are still laws within Tashkent that prevent businesses from creating properties that will be considered dangerous to the public, and if buildings do not meet these regulations they will not be granted government permission. One specific law around this is ShNK 2.07.01 - 0.3, which states that the distance between the facades of 9 storey buildings should be at least 40 m. However, many companies have discovered a loop hole within these laws. The specified legislation does not discuss the distances between facades of properties that are 16 floors or above. Many architectural and construction companies have begun to solely build these large properties so that they can utilise the land more efficiently. This usage of the land doesn't provide appropriate insolation per apartment (a minimum of 2.5 hours per apartment is required), furthermore, the distance between the buildings doesn't provide enough space to have the correct infrastructure between them, such as car parks, playgrounds and green spaces (Saidov, 2021). According to G.K. Goldstein (Saidov, 2021), increasing the gaps between the facades of these buildings would improve ventilation, insolation and help decrease the population density, each factor would help improve the overall quality of life within Tashkent.

With the environment suffering so detrimentally within Uzbekistan and the global rise of climate related issues, Uzbekistan is likely to be pressured into repairing its environment by transitioning into a green economy by eco-activists and other governments in the hopes that they can achieve the status of a “green city”. In a recent report conducted by the world bank (Bank, World, 2022), which was produced in collaboration with the Ministry of Economic Development and Poverty Reduction and other government agencies of Uzbekistan, there was an analysis of challenges and opportunities for Uzbekistan to transition to a green economy. It identifies the most urgent environmental factors, as well as recommends on policy changes such as energy efficiency measures and landscape restoration programs will benefit the economy and the environment at the same time. Which shows that there is already pressure being placed on the country to change

To transition into a green city the city must implement and develop ecological infrastructure and put it into practice. They can do this by constructing new modern and comfortable buildings. They can do this by using more sustainable materials and practices for example they can consider European trends, will help to introduce green roofs. For example, a green roof can help reduce the cost of electricity (heating, air conditioning) by 10% or more, via solar panels which will absorb and utilise the suns heat cooling down the area surrounding them.

Furthermore, it is important to create builds as environmentally friendly as possible, they can do this by taking into account local traditions and natural-climatic conditions that were more, ecologically effective than the current properties that are being erected.

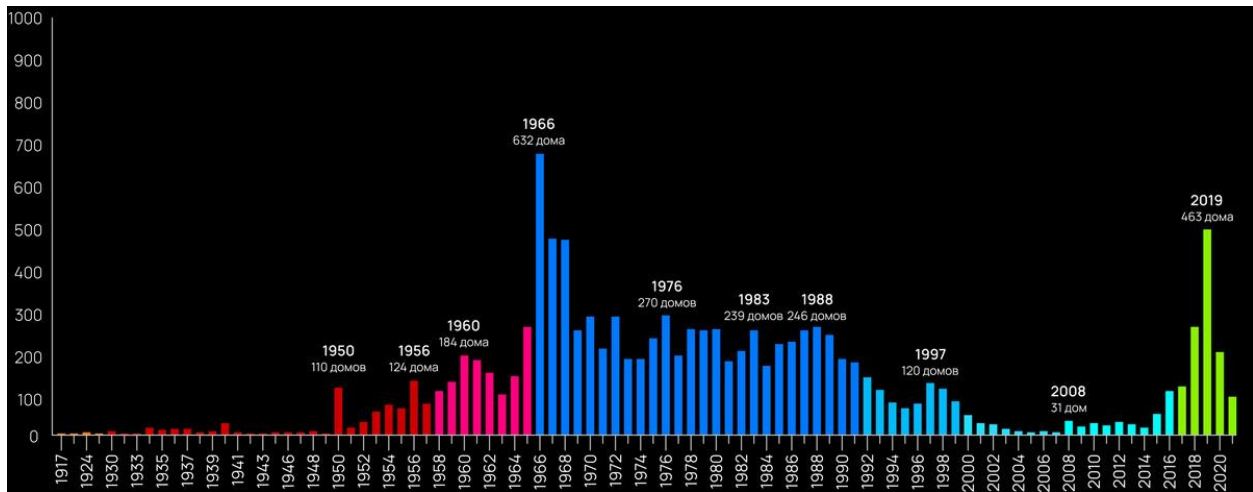
However, the concept of a green city also extends to the infrastructure of the city, to achieve the title of a green city Uzbekistan would need to fix and maintain its irrigation water supply system and modify it to become renewal. Furthermore, there would need to be an improvement on the network of roads to help reduce the drive times and decrease traffic within the city so people will spend less time driving reducing emissions, and improving air quality. And finally, there would need to be an implementation of green-zones, including attractive places such as playgrounds, sports fields, skate parks and bicycle paths. This has already begun to be adopted. In a recent presidential decree signed in December 2022 (Database, 2022) outlines certain reforms the authorities will need to be implement in this area. It outlined the adoption Plan for Transitioning to a Green Economy and Ensuring Green Growth that will be achieved by 2030, which includes measuring, reporting and addressing the current environmental and economic challenges to achieve the status of a green city, this study will set the foundation for Uzbekistan to begin to transition into an environmentally friendly country.

CONCLUSION

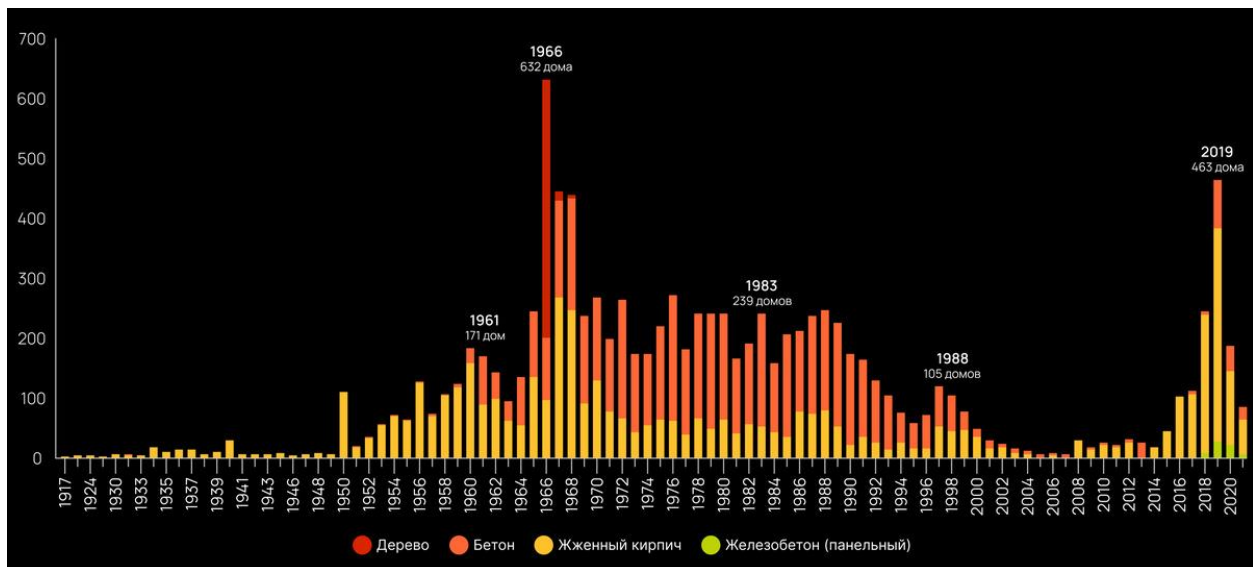
In conclusion after analysing the history of Uzbekistan and more specifically Tashkent, considering environmental, social and economic factors we can see that Tashkent has undergone numerous changes in leadership and traditions. These changes have developed and improved the economic and social factors for the country by helping families stick together and increasing the GDP of the country. However, these changes have failed to address environmental concerns. The current practices utilised by the Uzbekistan government and the construction industries have caused detrimental effects on the environment of Tashkent and it will not be sustainable for long term growth.

To help counteract this, this dissertation believes that Tashkent should take into consideration traditional building practices, current European trends, stricter building regulations and the maintenance and improvements to the current infrastructure within the city of Tashkent to help improve its environmental factors in the hopes that the country can become more sustainable in the future.

APPENDIX A (GRAPHS)



GRAPH 1. THE AMOUNT OF HOUSES BUILT THROUGHOUT THE YEARS



GRAPH 2. MATERIALS USE FOR CONSTRUCTION OF THE BUILDIN

LEGEND: WOOD, CONCRETE, BRICK, PANEL REINFORCED CONCRETE

APPENDIX B (INTERVIEW)

RUSSIAN (ORIGINAL):

Интервьюер: Исламова Шахло

Апрель 2023

Участник: Холматов Ильхом (Инженер строитель)

Тема: Строительство жилого сектора в Узбекистане: Исторический обзор и необходимость в экологичном развитии.

- Расскажите о вашем рабочем опыте, как долго вы работаете Инженер-строителем в Узбекистане?

- Я учился в Политехническом Институте, на факультете ПГС (факультет Промышленного и Гражданского Строительства).

С 1983 по 1991 год работал в Проектном Институте, сначала техником, затем инженером, инженером-конструктором и ведущим инженером. За 8 лет я полностью принимал участие в проектировании зданий, в основном сооружений Министерства Здравоохранения. После провозглашения Независимости Узбекистана в 1991 году ушел в бизнес.

В последние 8 лет я вернулся к своей специальности, стал соучредителем компании ARTIFEX. С этой компанией мы выполнили довольно много проектов для города Ташкент. В пример могу привести всеми известный Tashkent City; сама идея была наша, до того как ее продали руководству города. Изначальная идея проекта Tashkent City была построить бизнес-центр города, куда также должны были входить торговый центр, гостиницы, парк и т.д., однако руководство изменило концепт City на жилой комплекс.

- Как в последние 10-20 лет эволюционировала индустрия строительства жилого сектора в Узбекистане?

- Давайте я начну с предыстории. В 1870х годах Российская Империя захватила территорию Узбекистана. В это время начали расширять город Ташкент, то есть был старый город, и начали строить новый город. Новые строения были построены из кирпича, было много зелени. От Губернатора остались приказы о благоустройстве города. Также были некоторые ответственные лица, которые контролировали состояние ирригационной системы и занимались озеленением города. Также еще в то время был приказ посадить деревья у сквера революции (нынешний сквер Амира Темура), которые лет 10-15 назад были срублены.

Во времена Советского Союза в основном ничего не строилось, строения были примитивными.

После разрушительного землетрясения уже учитывалось сейсмостойкость сооружений, были усилены здания, которые были построены до землетрясения. В основном после землетрясения строились 5-этажные дома, а примерно в 70х годах уже стали строить 9-этажные дома, которые также были сейсмо-устойчивыми. по 12- бальной системе, причем Ташкент входит в 9-бальную зону и, соответственно, все нормы подстраивали под нее.

Ташкенте было построено 3 домостроительных комбината (ДСК) по привезенной из Франции технологии крупнопанельного строительства, по которой были построены 9-этажные французские крупнопанельные дома. В этих крупнопанельных домах 10-12 подъездов строилось за 2,5 месяца. Это были очень красивые дома, у каждого из которых был сделан отдельный восточный мозаичный орнамент на фасадах.

После 1991 года, что называлось временем «первой администрации» в течение 25 лет было затишье, однако все же строились некоторые жилые дома монополией «Габус» и несколькими коммерческими банками, которым было дано разрешение.

Нынешний «строительный бум»- это следствие того продолжительного затишья, которое обусловлено ростом населения и переселением людей в Узбекистан, что, следственно, создает колоссальный спрос на жилье. Поэтому «вторая администрация» дала разрешение на строительство всем зарегистрированным фирмам.

На сегодняшний день это считается прибыльным бизнесом, поскольку квадратный метр жилого пространства обходится в 210- 250\$, а продается от 700- 1300\$, поэтому многих современных бизнесменов привлекает строительство, которое иногда, увы, бывает немного некачественным.

Так произошла индустриализация строительного сектора в Узбекистане.

- Игнорируются ли нормы строительства? Если да, то почему?

- В нашей стране нормы жилищного строительства, в принципе, не игнорируются потому, что застройщики обращаются в ту или иную проектную мастерскую, каковых сейчас тоже много, и они, в свою очередь, обращаются к конструкторам, которые ответственно подходят к своей работе. К тому же, жилищное строительство не требует больших технологий.

Однако, игнорируются нормы градостроительства, такие как расстояние между зданием и дорогой, расстояние между зданиями, наличие парковой, прогулочной или парковочной зон между жилыми комплексами, так как никто их не контролирует.

- Как вы считаете, стоит ли усилить контроль над нормами строительства?

-Я считаю, что это должно контролироваться. Контролирующие органы должны периодически проверять соблюдение норм и пресекать отходы от них, начиная от остановки строительства вплоть до разрушения здания.

Так, например, в Америке, проверяющая комиссия может внезапно заявляться в строительный объект на протяжении его строительства, полностью проверять его и останавливать процесс, в случае выявления нарушений, с этим у них все очень строго. Также, строящиеся здания в обязательном порядке обвешиваются специальными сетками для предотвращения попадания мусора наружу. Я часто видел, что перед выездом со стройки запачканный грузовой автомобиль моет специально поставленный человек для того, чтобы не распространять грязь по городу, ведь за несоблюдение норм возлагаются очень большие штрафы.

А у нас, к сожалению, все это никто не контролирует.

Еще, в строительстве важно учитывать «розу ветров», что гласит о том, что ветер должен свободно гулять между всеми домами, чтобы обеспечить прохладу и свежий воздух во всем городе. В этом и заключается ошибка Дубая- наряду с другими факторами, они не учли и «розу ветров» и приступили к строительству многочисленных многоэтажных стеклянных зданий, внутри которых очень жарко. Поэтому, они кондиционируются большими чиллерами, выводящими горячий воздух наружу. В результате, находится на улице- невозможно, так как стекло отражает солнце, кондиционеры выдувают горячий воздух, а климат и без того изначально очень жаркий и солнечный. По этой причине сейчас они, учтя свою ошибку, переходят к использованию других стройматериалов.

В нашей же стране не учитывается расстояние между зданиями. и они строятся близко друг к другу. Например, в районе Карасу было построено несколько высотных зданий для Министерства Обороны и с балкона одного здания можно было бы перепрыгнуть на балкон соседнего, что не соответствует никаким нормам.

- Помимо роста населения, каковы другие причины в росте строительства жилого сектора?

-Увеличение благосостояния. К примеру, если раньше в одной квартире проживали 2-3 семьи, то на сегодняшний день, при увеличении дохода, они отделяются.

Принцип нашего Узбекистана: есть 1 город Ташкент, а все остальное- периферия, то есть жизни там «нет» и все стремятся попасть туда. Ташкент был закрытым городом, институт прописки не выдавал их. С недавнего времени, в целях поддержания бизнеса, прописку стали давать тем, кто приобретает квартиру в новостройке на сумму больше 40.000\$. Это подтолкнуло областное население покупать квартиры в Ташкенте, что увеличило на них спрос, повлекший за собой быстрый рост города.

- Оказала ли строительная индустрия непосредственное негативное влияние на качество воздуха в Узбекистане?

- Естественно. Помимо несоблюдения норм чистоты и отсутствия штрафов за грязь, вырубали деревья. Раньше Ташкент был зеленым городом с большими деревьями, вырабатывающими кислород и создающими тень и прохладу, но сейчас они вырублены, а вместо них посажены елки, что очень плохо сказывается. Говоря о них, при «первой администрации» елки сажали повсеместно, а это дерево не подходит нашему климату, они капризны, и половина из них умирает.

Если углубиться в историю, был город Кухна Гургенч при Мухаммаде Хорезмшахе во времена Чингизхана. Когда Чингизхан начал захватывать Хорезм, он уничтожил ирригационную систему города, следовательно, земля превратилась в степь, пустыню через несколько лет. То же самое произошло и с Багдадом, после захвата города Хулагу- не только город, но и знаменитые великолепные сады были разрушены.

И это же происходит с Ташкентом- уничтожена ирригационная система. Раньше, когда я был ребенком, вдоль улиц были сообщения меж собой арыки, в которых текла вода, но сейчас их нет, поэтому если нет воды- нет и деревьев, нет деревьев- будет пыль, из-за чего у нас бушуют пыльные бури, последняя из которых была год назад. Тогда было очень трудно дышать и такое явление все учащается.

Еще одним последствием отсутствия ирригационной системы в Ташкенте- потопа из-за дождей, чего раньше не было. Эта проблема устраняется в других городах, но не в Ташкенте. Указом Президента было решено устранить проблемы в дренажной системе города за 2 недели, что для меня удивительно, ведь 30 лет эта система уничтожалась. Для этого нужна специальная программа и должны работать специалисты, которые только в течение 2 месяцев будут создавать правильный проект, после чего 1-2 года нужно будет работать над дренажной и ирригационной системами.

- Существует ли монополия в строительной индустрии и влияет ли она каким-либо образом на строительные нормы?

-Монополия была при «первой администрации», но на сегодняшний день, по моему мнению, монополии каких-либо лиц или компаний нет.

Но я бы сказал, что есть монополия денег, то есть все решается ими или через связи. Те, у кого они имеются, нарушают градостроительные нормы такие, как чрезмерно приближенная постройка дома к дороге при отсутствии двора или постройка за счёт территории другого дома, и никто на это не смотрит. Таких примеров я могу привести много. Так, к примеру, возле стадиона Старт построен новый красивый дом, но который ужасно посажен, что доставляет большие неудобства соседним жильцам. Там же на месте разрушенных двухэтажных построек планируют построить такой же дом, думаю, так же нарушая нормы и, вероятно, там возникнет транспортный коллапс.

Я считаю, что эта часть тоже является старым Ташкентом и вместо разрушения построек и возведения новых, лучше было бы их реставрировать.

- Какие энергосберегающие нововведения были внедрены в индустрию строительства?

- Они только начинают внедряться. Буквально в феврале вышел указ об установке солнечных батарей в новостройках и сейчас это продвижение активно начинается, хотя нужно было сделать это раньше, ведь у нас столько неиспользуемого солнца. У нас должны быть не только солнечные батареи, но и солнечные водонагреватели и ветряные электростанции, так как все это- возобновляемые энергоресурсы, которыми никто у нас не пользовался. Но теперь все это хотят внедрить, чему я рад, ведь в других солнечных странах все это уже есть. Например, на Кипре во всех домах установлены солнечные батареи и водонагреватели.

- Как вы считаете, были ли случаи, когда сооружения были неприемлемы для окружающей среды?

-Начну издаleка. Вообще я считаю, что в ключевых городах, как, например, Ташкент, обязательно должен быть принят дизайн-код города. Например, в городе Иерусалим есть определенный код- нельзя строить выше 4 этажей и все здания должны быть белыми. А в Париже нельзя строить в классическом стиле, чтобы не нарушать облик города. И такие отличительные особенности должны быть везде, на мой взгляд.

А в нашей стране такие города, как Наманган, Фергана и другие близлежащие ничем не отличаются друг от друга- в каждом есть одинаковые двухэтажные желтые дома. Ведь

ответственный за это уважающий себя архитектор должен внести в город какое-то отличие. Я боюсь, что и Ташкент может стать таким.

В период «первой администрации» у нас было популярно купольное строение- почти каждое здание строили с куполами неизвестно с какой целью и функционалом. В нынешнее время излюблены дома в так называемом «классическом» стиле такие как жилищный комплекс «Казахстан» или «Феличита». Для меня непонятно как связан Узбекистан, Средняя Азия, и итальянская классика и зачем ее сюда привозить, это неправильно, ведь у нас есть своя классика и в современном виде можно показать, что это- Восток.

Кроме, не учитываются ландшафт и местные особенности. Например, раньше театр имени Алишера Навои утопал в зелени так же как и гостиница «Узбекистан»- визитная карточка Ташкента, а сейчас не найти здания, вокруг которого было бы так много зелени. Это проблема для Узбекистана. До сегодняшнего дня нету утвержденного генерального плана Ташкента. Строят хаотично как и где хотят, нарушают фасад.

Самое ужасное это то, что в Узбекистане строят и продают квартиры в черновой отделке, в то время как во всем мире после покупки можно сразу жить, еще и кухня есть. То есть после покупки квартиры человек должен потратить еще массу денег и времени на ремонт.

Хуже того, после окончания вашего ремонта и начала жизни в новой квартире, в течение 5-6 лет ваши соседи будут делать ремонт, звуки, шумы или протечки от которого вам, естественно, будут не по нраву. Поэтому я убежден, что необходимо законодательно запретить продажу жилья в черновой отделке. Для этого нужен специальный орган, который проверял бы и утверждал бы полную готовность и пригодность здания для жизни перед продажей, как и во всем мире, иначе я считаю это нарушением прав человека.

Человеку иной профессии, не строитель, не должен заново приглашать архитекторов и строить, ведь архитектор уже должен был поработать там и сделать проект, это неправильно. При этом есть риск того, что приглашенные «псевдо-строители» могут навредить дому, как целому организму, сделав что-либо неверно.

Так, например при проверке домов в Турции после землетрясения выяснилось, что во многих квартирах были снесены несущие стены, это говорит о работе непрофессионалов и это опасно. У нас в этом плане пока царит хаос и анархия.

Interviewer: Shakhlo Islamova

April 2023

Participant: Holmatov Ilkhom (Civil Engineer)

Title: Housing Construction in Uzbekistan: A Historical Overview and the Need for Sustainable Development

Q: Tell me about your working experience, how long have you been working as a civil engineer in Uzbekistan?

A: I studied in Polytechnical Institute, on the Faculty of Industrial and Civil Engineering.

From 1983 to 1991 I was working in a Project Institute as a technician, then as an engineer, construction engineer and finally as a leading engineer. For these 8 years I was taking part in the building construction projects, mainly working with buildings for the Ministry of Health. After the proclamation of Independence of Uzbekistan in 1991 I was working as a businessman.

In the last 8 years I returned to working by my speciality and became a co-founder of a company named ARTIFEX. We have completed many projects in Tashkent with this company. For example, Tashkent city, which is known by everyone in Uzbekistan; before the project was sold to the government, the idea was ours (of the ARTIFEX company). The initial idea of the Tashkent City project was to build a main business centre of the city, which would also include shopping centre, hotels, parks and etc., however the government has turned the concept into a residential area.

Q: In the past 10-20 years, how has the residential building construction industry evolved within Uzbekistan?

A: Let me start with a little prehistory. In 1970s the Russian Empire has seized the territory of Uzbekistan. During these times the city started to expand, so there was an old city and they started building a new city of Tashkent. The new buildings were made of bricks. There was a plenty of green spaces. The Governor of the territory was giving out orders of provision of all necessary amenities. There were several responsible people who were controlling the state of irrigation systems and were working on a greenery in the city. During these times there was an order to plant trees on the Revolution Square (now Amir Temur Square), which were completely cut down 10-15 years ago.

Nothing was really constructed during Soviet times, most of the buildings were primitive.

After the destructive earthquake (1966) the seismic resistance of the buildings was taken into considerations, buildings that were constructed before the earthquake were reinforced. Mainly 5-storey buildings were built during these times, and roughly in 1970s, 9-storey buildings were constructed, which were also earthquake resistant. According to the 12-point system, Tashkent is included in the 9-point zone and, accordingly, all the norms were adjusted to it.

In Tashkent, 3 house-building factories (DSK) were built using the technology of large-panel construction brought from France, according to which 9-storey French large-panel houses were built. In these large-panel houses, 10-12 entrances were built in 2.5 months. These were very beautiful houses, each of which had a separate oriental mosaic ornament on the facades.

After 1991, what was called the time of the “first administration”, there was a lull for 25 years, but some residential buildings were still being built by the Gabus monopoly and several commercial banks that were given permission.

The current "construction boom" is a consequence of the long halt, which is due to population growth and the resettlement of people in Uzbekistan, which, consequently, creates an enormous demand for housing. Therefore, the "second administration" permitted the construction of all registered firms.

Today it is considered a profitable business, since a square meter of living space costs \$210-250, and sells from \$700-1300, so many modern businessmen are attracted by construction, which sometimes, alas, is a bit of poor quality.

This is how the industrialization of the construction sector in Uzbekistan took place.

Q: Are the building regulations being ignored, if so, why?

A: In our country, housing construction standards, in principle, are not ignored because developers turn to one or design workshop, of which there are also many now, and they, in turn, turn to designers who take a responsible approach to their work. In addition, housing construction does not require high technology.

However, urban planning norms are ignored, such as the distance between the building and the road, the distance between buildings, and the presence of parks, walking or parking areas between residential complexes, since no one controls them.

Q: Do you think building regulations should be more strictly enforced?

A: I think it should be controlled. Regulatory authorities must periodically check compliance with regulations and prevent waste from them, from the stoppage of construction to the destruction of the building.

So, for example, in America, the inspection commission can suddenly appear at a construction site during its construction, completely check it and stop the process, in case of violations, they are very strict with this. Also, buildings under construction are necessarily hung with special nets to prevent debris from getting outside. I often saw that before leaving the construction site, a specially appointed person washes a dirty truck in order not to spread dirt around the city, because very large fines are imposed for non-compliance with the rules.

Unfortunately, we have no control over all of this.

Also, in construction, it is important to take into account the “wind rose”, which means that the wind must freely walk between all the houses to provide coolness and fresh air throughout the city. This is a mistake of Dubai - along with other factors, they did not take into account the "wind rose" and began the construction of numerous multi-storey glass buildings, inside of which it is very hot. Therefore, they are conditioned by large chillers that bring hot air outside. As a result, being outdoors is impossible, as glass reflects the sun, air conditioners blow out hot air, and the climate is already very hot and sunny. For this reason, now, having taken into account their mistake, they are switching to the use of other building materials.

In our country, the distance between buildings is not taken into account. and they are built close to each other. For example, in the Karasu area, several high-rise buildings were built for the Ministry of Defense, and one could jump from the balcony of one building to the balcony of the neighbouring one, which does not meet any standards.

Q: Other than the population increase, what are some reasons for the increase in residential buildings?

A: Increasing wealth. For example, if earlier 2-3 families lived in one apartment, today, with an increase in income, they are separated.

The principle of Uzbekistan: there is 1 city of Tashkent, and everything else is a periphery, that is, there is “no life” there and everyone wants to get there. Tashkent was a closed city, the registration institute did not issue them. Recently, to maintain business, a residence permit has been given to those who purchase an apartment in a new building for more than \$40,000. This prompted the regional population to buy apartments in Tashkent, which increased demand for them, and led to the rapid growth of the city.

Q: Has the construction industry had a direct affect on the air quality within Uzbekistan?

A: Naturally. In addition to non-compliance with cleanliness standards and the absence of fines for dirt, trees were cut down. Previously, Tashkent was a green city with large trees that produce oxygen and create shade and coolness, but now they are cut down, and Christmas trees are planted instead, which has a very bad effect. Speaking of them, during the "first administration" trees were planted everywhere, and this tree is not suitable for our climate, they are capricious, and half of them are dying.

If you delve into history, there was the city of Kukhna Gurgench under Muhammad Khorezmshah during the time of Genghis Khan. When Genghis Khan began to capture Khorezm, he destroyed the irrigation system of the city, therefore, the land turned into a steppe, a desert after a few years. The same thing happened with Baghdad, after the capture of the city of Hulagu, not only the city but also the famous magnificent gardens were destroyed.

And the same is happening with Tashkent - the irrigation system has been destroyed. Before, when I was a child, along the streets there were ditches interconnected, in which water flowed, but now they are not, so if there is no water, there are no trees, no trees, there will be dust, which is why we have dust storms, the last one was a year ago. Then it was very difficult to breathe and this phenomenon is becoming more frequent.

Another consequence of the lack of an irrigation system in Tashkent is flooding due to rains, which did not happen before. This problem is being eliminated in other cities, but not in Tashkent. By the Decree of the President, it was decided to eliminate the problems in the drainage system of the city in 2 weeks, which is surprising for me, because this system has been destroyed for 30 years. For this, a special program is needed and specialists must work, who will create a correct project only within 2 months, after which it will be necessary to work on the drainage and irrigation systems for 1-2 years.

Q: Is there a monopoly within the building industry and is it somehow affecting the building regulations?

A: There was a monopoly under the "first administration", but today, in my opinion, there is no monopoly on any individuals or companies.

But I would say that there is a monopoly of money, that is, everything is decided by them or through connections. Those who have them violate urban planning norms, such as building a house too close to the road in the absence of a yard, or building at the expense of the territory of another house, and no one looks at it. I can give many such examples. So, for example, a new beautiful house was built near the Start stadium, but it is planted, which causes great inconvenience to neighbourhood residents. In the same place, on the site of the destroyed two-story buildings, they plan to build the same house, I think, also violating the norms and, most likely, there will be a transport collapse.

I believe that this part is also the old Tashkent, and instead of destroying buildings and building new ones, it would be better to restore them.

Q: What energy saving improvements have been implemented in construction industries?

A: They are just starting to take root. Literally in February, a decree was issued on the installation of solar panels in new buildings, and now this promotion is actively beginning, although it should have been done earlier because we have so much unused sun. We must have not only solar panels but also solar water heaters and wind farms since all these are renewable energy resources that no one used in our country. But now everyone wants to implement this, which I am glad about because other sunny countries already have all this. For example, in Cyprus, solar panels and water heaters are installed in all houses.

Q: In your opinion, were there any case when the buildings were not suitable for the environment?

A: I'll start from afar. In general, I believe that in key cities, such as Tashkent, the design code of the city must be adopted. For example, in the city of Jerusalem, there is a certain code - you cannot build higher than 4 floors and all buildings must be white. And in Paris, you can not build in the classical style, so as not to violate the appearance of the city. And such distinctive features should be everywhere, in my opinion.

And in our country, cities such as Namangan, Fergana and other nearby cities are no different from each other - each has the same two-story yellow houses. After all, a self-respecting architect responsible for this should bring some difference to the city. I'm afraid that Tashkent can become like that too.

During the period of the "first administration", a domed building was popular with us - almost every building was built with domes, but it is not known for what purpose and functionality. At present, houses in the so-called "classical" style, such as the housing complex "Kazakhstan" or "Felicita", are favoured. It is not clear to me how Uzbekistan, Central Asia, and Italian classics are connected and why to bring them here, this is wrong because we have our classics and in a modern form it can be shown that this is the East.

In addition, the landscape and local features are not taken into account. For example, earlier the theatre named after Alisher Navoi was buried in greenery, just like the hotel "Uzbekistan" - a visiting card of Tashkent, but now you cannot find a building around which there would be so much greenery. This is a problem for Uzbekistan. To date, there is no approved master plan for Tashkent. They build randomly as and where they want, breaking the facade.

The worst thing is that in Uzbekistan they build and sell apartments with a rough finish, while all over the world after the purchase you can immediately live, there is also a kitchen. That is, after buying an apartment, a person has to spend a lot of money and time on repairs.

Worse, after you finish your renovation and start living in a new apartment, within 5-6 years your neighbours will make repairs, sounds, noises or leaks which you, of course, will not like. Therefore, I am convinced that it is necessary to legally prohibit the sale of housing with a rough finish. This requires a special body that would check and approve the complete readiness and suitability of the building for life before the sale, as in the whole world, otherwise, I consider it a violation of human rights.

A person of a different profession, not a builder, should not invite architects again and build because the architect should have already worked there and made a project, this is wrong. At the same time, there is a risk that the invited "pseudo-builders" can harm the house, as a whole organism, by doing something wrong.

So, for example, when checking houses in Turkey after the earthquake, it turned out that load-bearing walls were demolished in many apartments, this indicates the work of non-professionals and this is dangerous. In this regard, chaos and anarchy still reign in our country.

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