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PECULIARITIES OF HOUSING ARCHITECTURE IN VARIOUS CLIMATIC CONDITIONS OF AFGHANISTAN

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Abstract: On the basis of the study of the traditional dwelling of Afghanistan, information is given on the features of architecture in conditions of dry hot climate, which reflects the desire of the inhabitants to neutralize the adverse consequences of summer overheating. It is noted how the inhabitants of dwellings adapt to the complex conditions of the terrain, taking into account the ancient traditions of Afghanistan's housing construction.

Key words: tradition; people's dwelling; interior of a residential building; natural and climatic features; shaping factors; techniques of architectural composition.

1.INTRODUCTION

About Afghanistan [7]

Afghanistan 652 230 km area. Location 65 ° - East and 33 ° North.

Top Point of Afghanistan Noshank 7485 M.

Population of Afghanistan [7] in 2017 about 31,108,077 Persons:

From North with Tajikistan 1206 km. Uzbekistan 137 Km and Turkmenistan 744 K. From West Iran 936 Km. from North and South with Pakistan 2430 Km. and from North. East with China 76 Km. Afghanistan is divided into 34 provinces.

Administrative divisions of the year (1773) after its Capital, Kabul was once Timor Shah began.

Area of Kabul is 4523, 85 Km.

Regions within Afghanistan:

[As mentioned in Wikipedia] Afghanistan is made up of 34 provinces (wilāyat). The provinces of Afghanistan are the primary administrative divisions. Each province encompasses a number of districts or usually over 1,000 villages.

Provincial governments are led by a governor who is appointed by the President of Afghanistan. Provincial governors have played a critical role in the reconstruction of the Afghan state following the creation of the new government under Hamid Karzai. According to international security scholar, Dipali Mukhopadhyay, many of the provincial governors are former warlords who have been incorporated into the political system.

About Climatic Conditions of Afghanistan:

The Islamic Republic of Afghanistan together with the World Food Programme (WFP) and the UN Environment Programme (UNEP) has prepared this technical report, "Climate Change in Afghanistan: What Does it Mean For Rural Livelihoods and Food Security?" [7]

This report looks at four types of climate hazards—distinguishing between two types of drought and floods because they are caused by different climate variables and affect different areas and livelihood groups:

(1) Drought caused by localized lack of spring rainfall, with the highest impact on rainfed agriculture and pastoral areas; [7]

(2) Drought caused by reduced snowmelt in upland areas in spring and summer, mostly affecting downstream irrigated areas; [7]

(3) Floods caused by localized heavy spring rainfall, affecting all livelihood zones; [7]

(4) Floods caused by increased snowmelt in highland areas during the spring and summer, mostly affecting downstream agricultural livelihood zones, particularly areas located along rivers. [7]

Afghan cities have great potential to improve livelihoods, drive economic growth and provide safe and affordable housing and adequate services. With continued urbanization in Afghan cities occurring in the next few decades, there is a great opportunity to promote urban development that is sustainable, equitable and a catalyst for economic growth. [8]

The priorities of the National Unity Government of Afghanistan for the urban sector are very clear. The 'Realizing Self-Reliance' Framework presented at the London Conference on Afghanistan in 2014 explicitly stated cities are to be drivers of economic development. The Ministry of Urban Development Affairs (MUDA) is currently leading the drafting of an Urban National Priority Programme (U-NPP) and associated comprehensive urban development programme. Together these will lay the foundations for a sustainable urban future[8].

Description and Analysis of Peculiarities of Housing Architecture in Various Climatic Conditions of Afghanistan:

The ancient Greeks, having conquered the Bactrian lands, tried at first to build buildings with pitched roofs, using inclined rafters and tiled roofs widely used in Greece, as evidenced by archaeological finds on the territory of Afghanistan in the Ayhanum mound. [3] In later periods, the roofing tile elements (antefixes) were already used only in flat beams as a decorative finish of the cornice, as can be seen from the example of the palace in Khalchayan [2]. Traditional flat wooden beams from wood more corresponded to the natural and climatic conditions of these places, and so pitched roofs were soon forgotten. The subsequent evolution of the architecture of the dwelling of the plains and foothills of Afghanistan was associated with the spread of spherical forms of coatings.

The genesis of the use of spherical structures in Central and Middle Asia is, in the opinion of the Moscow researcher of the architecture of Afghanistan, V. N. Kartsev, from the yurt - the dwelling of ancient, predominantly Turkic-Mongolian nomadic peoples, inhabiting the vast territory of the Great Steppes from Eastern Europe to East Asia and repeatedly invaded the lands of Afghanistan. The use of cupola and vaulted coverings in a dwelling instead of the girder structures that were used here began, in all probability, in the Kushan era, when the influence of nomadic peoples on the formation of a new culture was particularly great [2].

It can be assumed that the spherical shape of the light, portable nomadic home during their transition to a settled way of life was used as a prototype on the basis of the already known experience of erecting domes, which determined their further development as a more rational and local design, conveniently constructed from raw materials without using the scarce wood needed for flat coatings. In the folk dwelling of the plains and foothill areas of Afghanistan, the premises in most cases are divided into summer and winter. Even the smallest house has, as it were, two cells adapted for living in summer and winter. The first is always oriented to the north in order to

eliminate the heating of the premises by the summer sun; the second one is located with the predominant orientation to the south, and the winter sun, penetrating into the depth of the room, warms it with its rays on cool winter days (Figure 3).

The area of light in the summer living rooms is minimal, sometimes there are no windows at all, and the light passes through the entrance opening and the upper air outlet. Walls of houses on flat territories are clay-bills, more precisely from loess or alumina mass (pakhsa). The foundations are made of the same material and have a minimum depth, since the loess or clay base provides the necessary elasticity under seismic influences and sufficient strength. The thickness of the walls reaches 2 m and more. In foothill areas, the construction of walls and foundations includes a natural stone, which is laid out in rows, alternating with clay-fill. Massive exterior walls protect the living space in hot summer hours in the summer and keep warm in winter. Houses are almost always single-storeyed, and on mountain slopes - terraced type (Figure 1).

Areas of living rooms - the initial cells-modules of the house - are determined not only by the size and composition of family members, but also mainly by the constructive capabilities of the adopted overlapping system - the most complex and responsible part of any building. For a dome cover, it is advisable to have rooms that are close in terms of a square, with a span between the bearing walls up to 4-5 m. The dome cover is made without formwork and is rotated on a gypsum solution from a slightly burned or raw brick.



Fig.1. Afghanistan. Piedmont type of dwelling (1910)



Fig.2. Afghanistan. Living room Nuristan's with a log dome (1910)

The most common way of laying a masonry in a spherical direction is known under the name "balkhi" - in a place where it is apparently first widely used (Balkh province). To the XI century. This method was widely distributed not only in Afghanistan, but throughout Central Asia [1] (see Figure 3).

Of great importance is the choice of the outline of the arch. The curve approaching the parabola excludes the possibility of tensile forces and forces the material to work only on compression. This is especially important, since the local brick has little strength.

Cladding of the "balkhy" type of covering begins with angles inclined from the edges, the slope of which gradually decreases and becomes almost vertical with the arch of the arch. In the castle part of the arch a hole is arranged. In the cylindrical vaults, which are also erected without turning, an ancient technique of supporting the cover to several rows of masonry, which extends from the plane of the wall, has been preserved. The vault is built with slightly inclined vertical rings, which allows each preceding complete row to be used as a support.

Inadequate timber reserves justify the use of these simple and effective structures, which also have a small area of irradiation due to direct sunlight due to the spherical surface. With considerable massiveness, spherical coatings provide reliable protection against overheating. Inside the room, overlapped with a dome or a vault, good air exchange conditions are created (see Figure 2).

In the western regions of Afghanistan in the summer to protect from wind and dust and at the same time create more intensive air exchange inside premises in the coatings are often arranged by scoops (husa-kash), which are oriented to the north side. Flows of cool air through the vertical shaft pass into the living quarters and promote their cooling in the hot season. The domed dwelling in most cases is built so that the rooms adjoin one another. This makes it possible to compactly group such houses into a whole residential complex, and the high corner towers adjacent to such a settlement turn it into a well-protected fortress (feces). Such fortified settlements have a peculiar architectural appearance and are often found in the plains and foothills of Afghanistan.

Plains and foothills of Afghanistan, as well as the territory of Central Asia, are close in their summer climatic indicators to areas with dry hot climate in the vast territory of the South-West



Asian region. In this region there was a type of dwelling with an internal enclosed courtyard. This highly effective architectural and planning method, widely used in Afghanistan and Central Asia, ensures the creation of a favorable microclimate: high walls and perimeter-fenced residential areas, with inclusion in the enclosed space of the courtyard of the reservoir, reliably protect against overheating in the hot summer months.

Fig.3. Features of the formation of the "Balkh" (1922)

Floors in all rooms are adobe or stone, located slightly below the level of the outer surface of the earth. Such a method also achieves the necessary reduction of the air temperature in the living quarters due to the cooling effect of the soil.

In the foothill areas there is often a semi-enclosed volumetric and planning structure of a dwelling with a developed aivan located along the walls protecting the living quarters. Such aivans are obligatorily disclosed in the courtyard, which facilitates regulation microclimate of the home in the conditions of sharp temperature fluctuations from day to night. In the semi-enclosed space of aivan, the air temperature is equalized due to the thermal inertial properties of the material of the external walls, the floor and other enclosing structures. In the evening and night hours in residential premises, intensive through vent

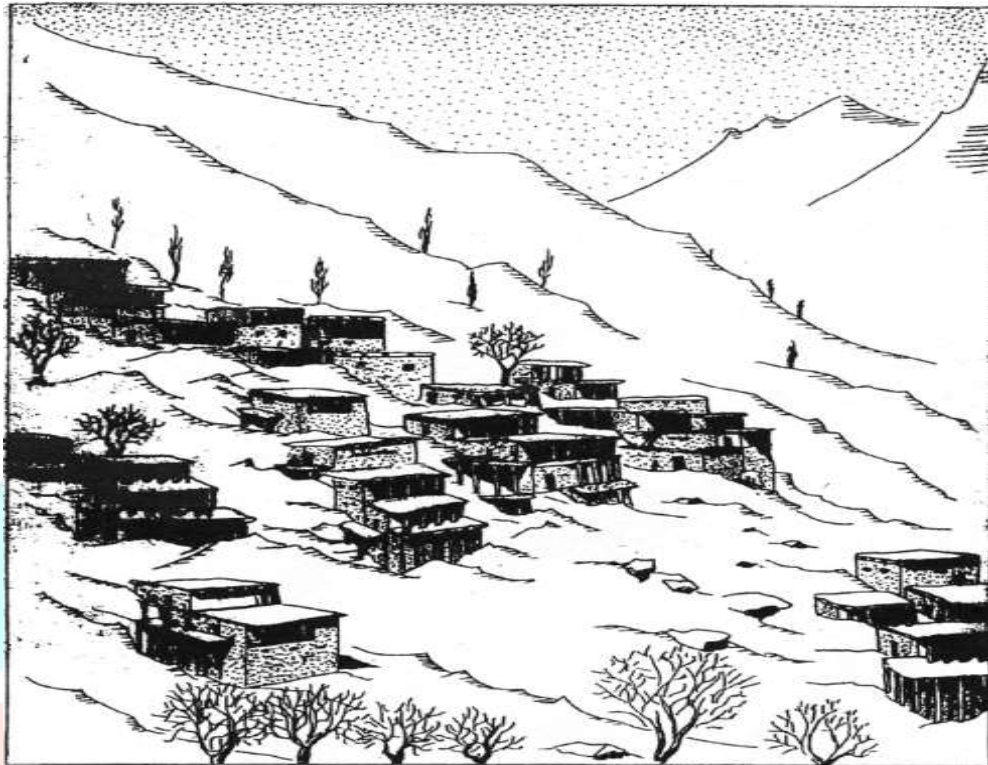
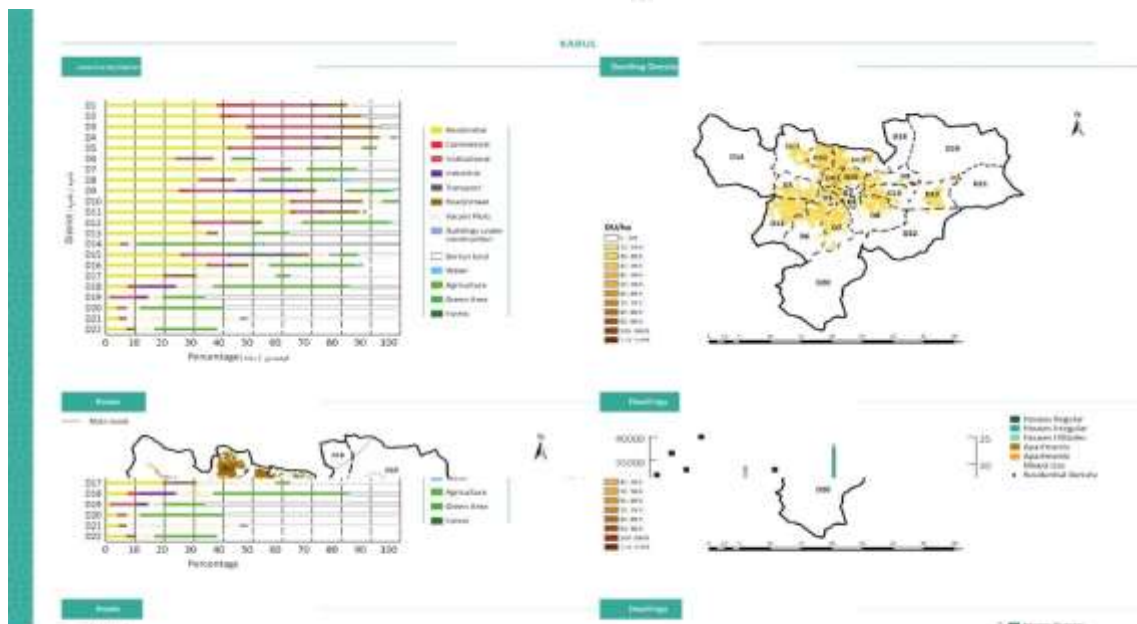
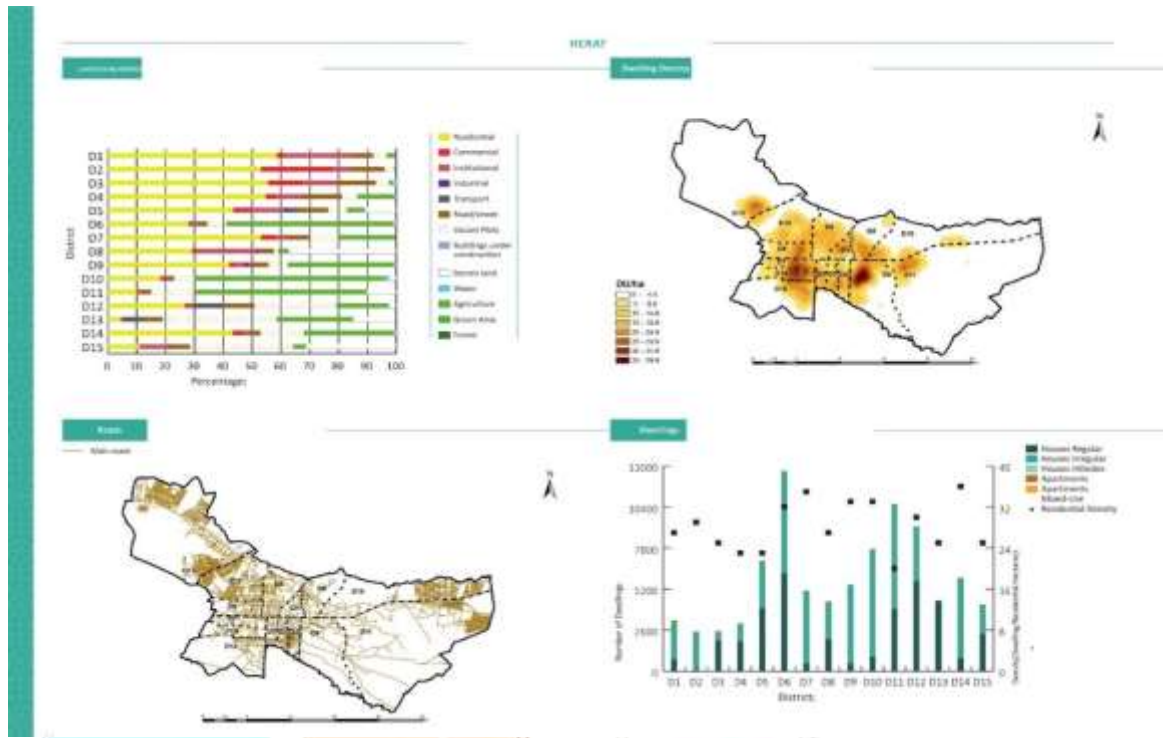


Fig.4. Terraced houses on the mountainside of Afghanistan (1910)

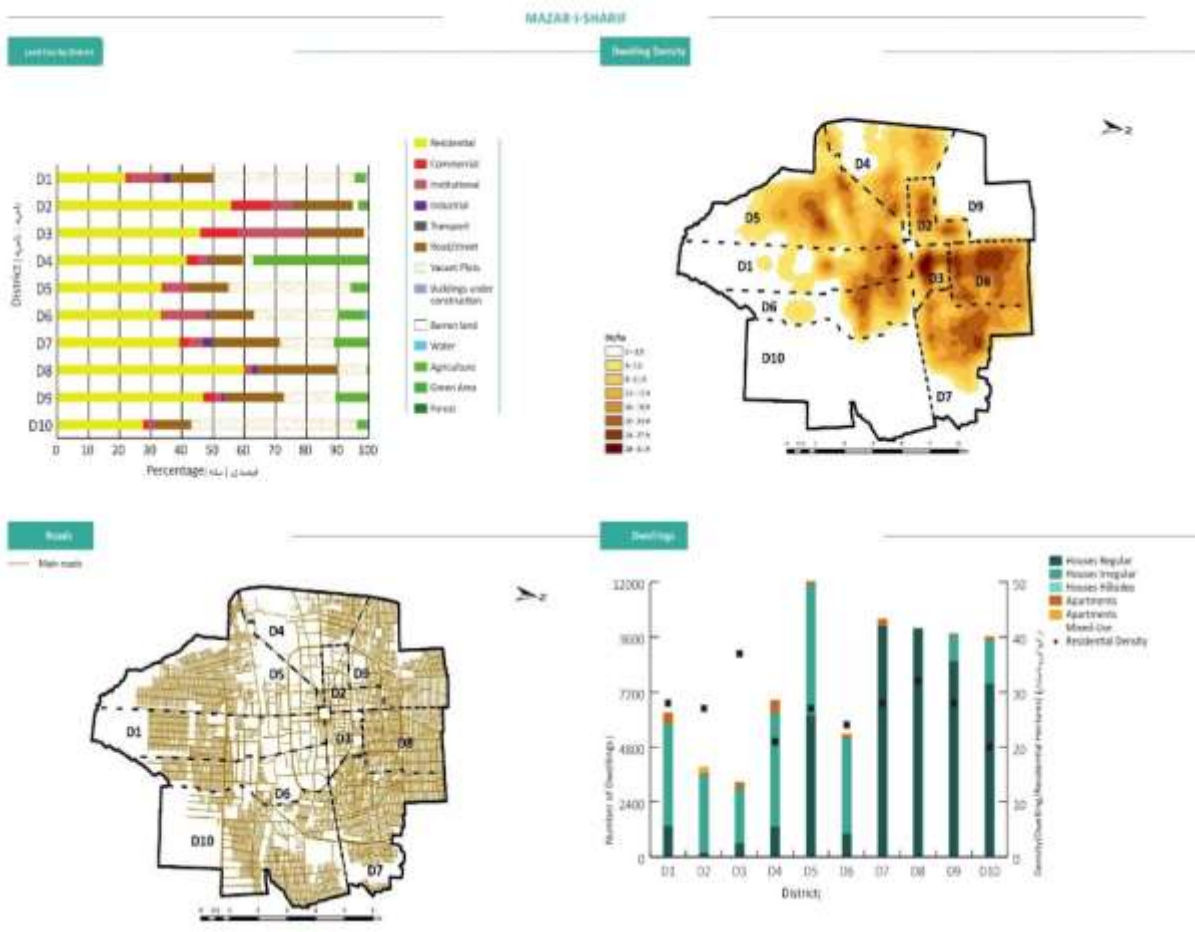
the formation of the architectural and composition structure of the dwelling of the plains and foothill areas consists in the fact that the connection of the organized space with the environment is directed to a gradual decrease in the high summer air temperature from the local area to the enclosed premises. The main role of home air conditioning is performed by an internal watered and greened courtyard or garden. It is these features of Afghanistan's dwelling that can be used in modern design conditions for individual residential buildings of a new type [6]



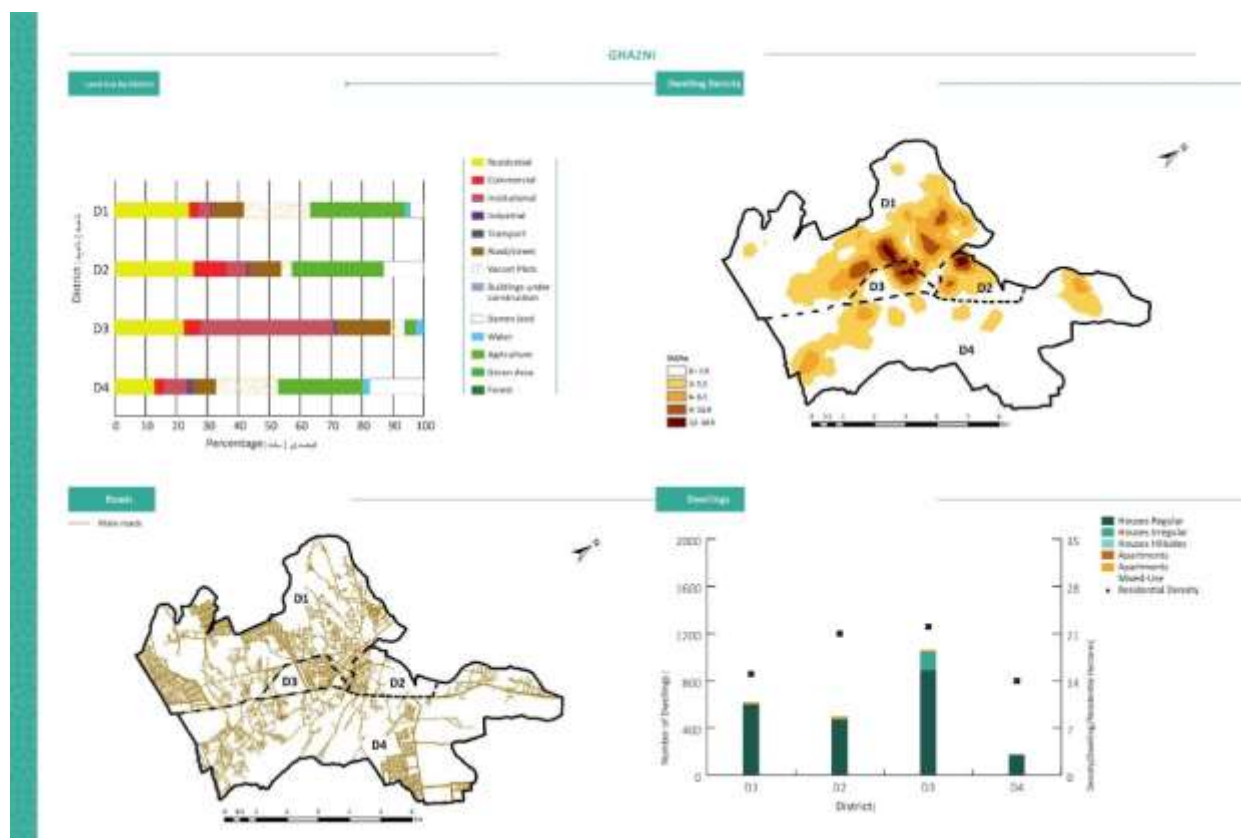
State of Afghan City Kabul UN-Habitat



State of Afghan City Herat UN-Habitat



State of Afghan City Mazar-i-Sharif UN-Habitat



State of Afghan City Ghazni UN-Habitat

Conclusion:

1. The first half of the III millennium BC. e. is marked by the addition in the south of Afghanistan and in adjacent areas of a fairly large number of settlements, the inhabitants of which were farming and cattle breeding.
2. Analysis of the monuments of early iron on the area of Central Asia shows almost a thousand-year continuity in the development of the monumental architecture of Bactria, where the traditions of Achaemenid Iran had a great influence.
3. On the basis of interpenetration and mutual enrichment of traditions in Central Asia, including in Afghanistan, during the creation of a single centralized Achaemenid state in the 6th-5th centuries. BC, sustainable methods of town-planning and housing construction, agriculture and artificial irrigation were developed.
4. After the conquest of Bactria by Aleksei the Macedonian, there is a sharp turn from the old Bactrian origin in the architecture of Afghanistan to other methods of urban planning, based on the principles of the Greek "regular city", to new forms in the architecture of monumental buildings and structures.
5. The development of new Hellenistic traditions in architecture and art in Northern Afghanistan had a huge impact on the formation of culture in other parts of Central and Middle Asia, North-West India.
6. In the Middle Ages in Afghanistan, there is an intensive growth of cities. An integral part of the architecture of many cities are fortification structures (castles, fortified country estates, caravansaries, discounts, etc.), which form a silhouette and determine their further development.
7. Creations of Afghan folk masters, defined as architectural folklore, have always been the main breeding ground for the development of architecture in the New Times (XIX-early XX centuries).

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