

Analysis and Current Problems of Greening Small Cities in Arid Conditions

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Article History	Abstract
Received: 26 th April, 2026 Accepted: 24 th May 2026	The article examines current problems of greening small cities located in arid climatic conditions. An analysis of green spaces in the cities of Khanabad, Yangiyo‘l, and Chinoz was carried out. The main factors contributing to the degradation of landscaping systems were identified, including high anthropogenic pressure, reduction of green areas, insufficient use of adapted tree and shrub species, violations of maintenance technologies, and lack of irrigation. Climatic, soil, and ecological characteristics of the territories affecting the sustainability of green plantings were investigated. Measures aimed at improving urban greening systems are proposed, including the reconstruction of existing plantings, expansion of plant diversity, development of vertical landscaping, and rational use of vacant urban areas.
Keywords: greening, small cities, arid climate, green spaces, urbanized territories, tree and shrub species, ecology, phytodesign, vertical landscaping, reconstruction of plantings.	

Аннотация

В статье рассматриваются современные проблемы озеленения малых городов, расположенных в засушливых климатических условиях. Проведен анализ состояния зеленых насаждений в городах Ханабад, Янгиюль и Чиназ. Выявлены основные факторы деградации систем озеленения: высокая антропогенная нагрузка, сокращение площадей зеленых зон, недостаточное использование адаптированных древесно-кустарниковых видов, нарушение технологий ухода и недостаток полива. Исследованы климатические, почвенные и экологические особенности территорий, влияющие на устойчивость зеленых насаждений. Предложены меры по

совершенствованию системы озеленения, включающие реконструкцию существующих насаждений, расширение ассортимента растений, развитие вертикального озеленения и рациональное использование пустующих территорий.

Ключевые слова: озеленение, малые города, засушливый климат, зеленые насаждения, урбанизированные территории, древесно-кустарниковые растения, экология, фитодизайн, вертикальное озеленение, реконструкция насаждений.

Annotatsiya

Maqolada qurg‘oqchil iqlim sharoitida joylashgan kichik shaharlarni ko‘kalamzorlashtirishning zamonaviy muammolari ko‘rib chiqilgan. Xonobod, Yangiyo‘l va Chinoz shaharlari yashil hududlarining holati tahlil qilindi. Ko‘kalamzorlashtirish tizimlari degradatsiyasining asosiy omillari sifatida yuqori antropogen yuklama, yashil maydonlarning qisqarishi, moslashtirilgan daraxt va buta turlaridan yetarli foydalanmaslik, parvarish texnologiyalarining buzilishi hamda sug‘orish yetishmasligi aniqlangan. Hududlarning iqlimiy, tuproq va ekologik xususiyatlari o‘rganilib, ularning yashil o‘simliklar barqarorligiga ta’siri baholangan. Mavjud yashil hududlarni rekonstruksiya qilish, o‘simlik turlarini boyitish, vertikal ko‘kalamzorlashtirishni rivojlantirish va bo‘sh yer maydonlaridan oqilona foydalanish bo‘yicha tavsiyalar ishlab chiqilgan.

Kalit so‘zlar: ko‘kalamzorlashtirish, kichik shaharlar, qurg‘oqchil iqlim, yashil hududlar, urbanizatsiyalashgan hududlar, daraxt va butalar, ekologiya, fitodizayn, vertikal ko‘kalamzorlashtirish, yashil hududlarni rekonstruksiya qilish.

Relevance of the Study. Under current conditions of climate change, increasing urbanization, and worsening environmental conditions, the problem of greening small cities located in arid regions has become especially relevant. Green spaces are an essential component of the urban environment, contributing to the improvement of the microclimate, reduction of air pollution, protection from dust and overheating, and enhancement of living comfort for the population. However, small cities are experiencing a reduction in green areas, degradation of existing plantings, limited diversity of tree and shrub species, and insufficient maintenance. In this regard, there is a need to develop scientifically based approaches to the reconstruction and development of urban greening systems adapted to the natural and climatic conditions of arid territories [1].

Modern landscapes of small cities in arid regions are characterized by a poor composition of ornamental vegetation and require enrichment of the flora, primarily through the introduction of tree and shrub species. Greening systems in populated areas are widely subject to degradation. The reasons for this situation include high anthropogenic pressure, deterioration of the environmental situation, insufficient use of adapted tree species, reduction of green space areas, and violations in the technology, maintenance, and functioning of landscaping systems [2].

[3]. This has led, on the one hand, to the aggravation of previously existing problems and, on the other hand, to the emergence of new factors contributing to the deterioration of the sanitary-ecological condition and the aesthetic appearance of urban areas [4].

The solution to the above-mentioned problems requires the study and implementation of a set of measures aimed at the development of populated areas and landscaping systems in particular [5].

[6, 7]. The objects of the study were the landscaping systems of the small cities of Khanabad, Yangiyo‘l, and Chinoz. (Table 1).

Table 1. Characteristics of the Objects

Settlement	Population Size	Area	Presence of Water Bodies
Khanabad	30000	200 км ²	Salar Canal
Yangiyo‘l	85000	0,42000 км ²	Kulgudek, Karasu Canal
Chinoz	68000	0,34 000 км	Bozsu and Chinoz Canals

The studied objects are represented by landscaped areas for public use, restricted use, special-purpose green spaces, and suburban green zones.

The inventory of plantings was based on the authors' own research and departmental materials. Standard and improved methodologies used in

dendrology, soil science, agroforestry reclamation, and ecology were applied.



The characteristic features of the region's climate are low precipitation, high summer (+42°C) and low winter (-38°C) temperatures, a dry and windy spring, and a long, hot, arid summer. The recurrence of moderate and severe droughts amounts to 50%. Climatic and soil conditions influence the formation of natural vegetation, which has a complex character. The vegetation cover has been significantly transformed under anthropogenic influence. The species composition has become monotonous. Native vegetation has been preserved only in a limited area.

Virgin steppe vegetation occurs along the steep slopes of ravines, represented by fescue, feather grass, as well as wormwood-grass, wormwood-forb, and reed-sedge associations. Forest vegetation is confined to ravines and river floodplains. The natural component of soils in small cities has undergone multiple transformations.

The history of landscaping plantings in these cities indicates a clear underestimation of soil conditions that determine the survival, growth, development, and longevity of green spaces. The degree of soil humus content, the thickness of soil horizons and the soil profile as a whole, density,

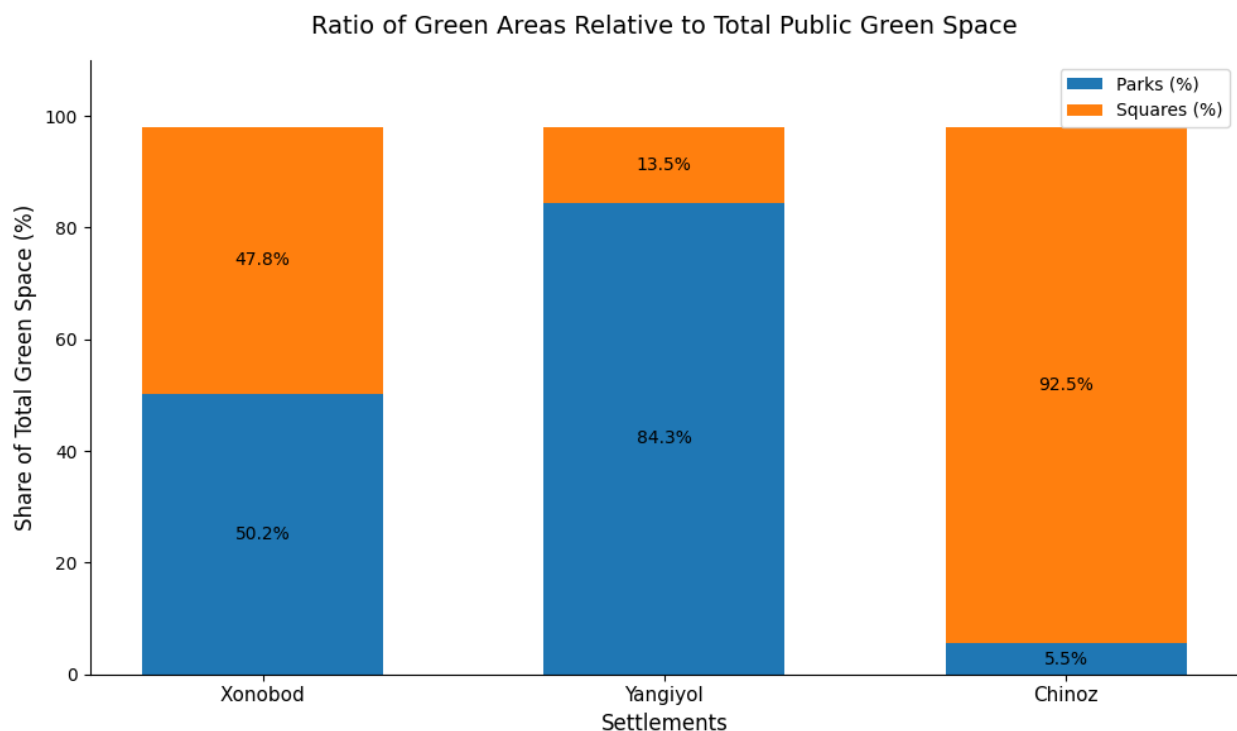
granulometric composition, soil moisture, salinity, alkalinity, and other factors limit the functioning of landscaping plantings.

At present, anthropogenic and, in some places, anthropogenically cultivated urban soils have formed, characterized by highly diverse forest-growing conditions. These conditions should be taken into account both during the reconstruction of mature green spaces and in the creation of new landscaping objects.

The placement of green spaces within urban territories is to a certain extent determined by the structure and area of functional zones. All the examined cities have a fairly clear planning structure with designated functional zones such as residential, industrial, and recreational areas.

The modern functional and planning organization of the territory of small cities has its own characteristics related to geographical location and historical development, which has affected the proportion of public green spaces.

An analysis of the inventory materials of the studied objects revealed that since 1980, the area of green spaces has shown a downward trend, while the area of urban development and the population have increased by 1.4 times.



The provision of public green spaces varies among the cities. A high indicator (including parks, squares, boulevards, etc.) is observed in Chinoz. The availability of green spaces is significantly lower in Yangiyo‘l. Existing standards for the provision of public green spaces (PGS) for residents vary considerably and, in many countries, are of a recommendatory nature. Your sentence is grammatically correct and suitable for academic writing. A slightly more formal version could be: The standards currently in force in our country are established by the state regulatory document (ShNK 1.03.03-23 “Planning of Construction Objects”) and range from 8 to 16 m² per capita, depending on the population size of the city.

In the cities of Yangiyo‘l and Khanabad, public-use plantings, which usually form the basis of the urban greening system, occupy sufficient areas and significantly exceed the standards recommended by ShNK 2.08.01-19 “Residential and Public Buildings.” The green zone surrounding Yangiyo‘l covers 207.5 hectares, Chinoz — 103.6 hectares, and Khanabad — 9.6 hectares. The main component of the landscaping system is dendrological resources. They are used in plantings for public, restricted, and special purposes. The inventory revealed that the existing plantings do not meet modern requirements and, in essence, represent dense thickets. They are characterized by a poor assortment of tree species, unsatisfactory sanitary condition, and the absence of water features and small architectural forms (gazebos, benches, etc.) necessary in a hot and arid climate. Under arid climate conditions, tree plantings should occupy about 50% of the total area of the territory. Vertical landscaping using a variety of climbing and creeping plants — vines — becomes especially important.

The death of planted vegetation is observed everywhere due to insufficient irrigation and the mismatch between the biological requirements of plants and environmental conditions. Forest and fruit tree and shrub species are commonly used, although each landscaping object requires not only an appropriate selection of plants that corresponds to planning and development conditions, but also one that satisfies ecological requirements.

To achieve the maximum aesthetic and sanitary-hygienic effect from green plantings, continuous crown maintenance is necessary, including formative, sanitary, and rejuvenating pruning. About 70% of the plantings require reconstruction. A clear shortcoming of urban landscaping is the absence of shrub plantings, while the existing shrubs are not properly trimmed. Issues related to the formation and maintenance of plants require constant attention from

landscaping specialists, organizations, and homeowners. Despite the significant shortage of green plantings in populated areas, there are many vacant lots that should be developed for landscaping purposes. Thus, green plantings possess a wide range of natural potential, the use of which can mitigate the negative effects of the environmental conditions of an arid climate, improve the level of environmental comfort, and address the tasks of phytodesign in urbanized territories.

Conclusion

Green spaces play a crucial role in improving the ecological, sanitary-hygienic, and aesthetic conditions of small cities located in arid regions. The conducted analysis revealed a reduction in green areas, degradation of existing plantings, poor species diversity, insufficient maintenance, and a mismatch between selected plant species and local environmental conditions. The study also showed that many green spaces require reconstruction and modernization.

Effective development of urban landscaping systems requires the use of adapted tree and shrub species, proper irrigation, scientifically based plant selection, regular maintenance, and the expansion of green zones. Special attention should be given to vertical landscaping, the creation of shrub plantings, and the improvement of vacant urban areas. The comprehensive implementation of these measures will contribute to increasing environmental sustainability, improving the microclimate, and enhancing the comfort and visual quality of urban environments in arid conditions.

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