

# REVITALIZING URBAN GARDENS

THE TRANSFER OF DEVELOPMENT RIGHTS APPROACH IN  
SHIRAZ, IRAN

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*As a result of urban growth, most of the gardens in the city of Shiraz, Iran, are now replaced by urban structures, causing urban environmental problems and affecting the quality of life of inhabitants. This paper attempts to introduce productive landscapes to achieve sustainable urban development in Shiraz. We propose strategies for the organized management of gardens in the "Ghasr-Dasht" region, the only remaining urban gardens in Shiraz. The aim of this paper is to conserve the Ghasr-Dasht gardens and to reestablish Shiraz's identity as a garden city. We study the effect of rehabilitation of the traditional gardens, in conjunction with the TDR approach, on improvement of urban ecological, social, and environmental qualities in the city.*

Shiraz, the capital of Fars Province, is one of the oldest cities in southern Iran, and an important historical, cultural, social, and economic center for the nation. Its name has been found in Achaemenian inscriptions in Persepolis. It was the Iranian (Persian) capital during the Zand dynasty from AD 1750 until 1781, and covers a land area of about 340 square kilometers. With an average elevation of 1500 meters above sea level, it is located (29\_530N, 52\_580E) in a northwest–southeast-elongated valley. The plains that cover the city have a northwest-southeast slope, with numerous springs and wells on the western part of the valley. These plains are surrounded by mountains connected at the north and northwestern parts of the city, from which many springs originate. The Rudkhaneye Khoshk (Dry River) flows through the northern part of the city seasonally, ending in the Maharloo Lake to the east. Running water has been a major factor in giving life to the gardens, flowing through the low-gradient and spiral streams, providing a pleasant effect on the atmosphere and giving spirit and livelihood to the city. Because most of the areas

in Shiraz historically were gardens and farms, Shiraz had a strong local economy and cultural history. Many areas of the city were once covered by multi-functional gardens that grew various species of plants and vegetables due to perfect weather and soil and plenty of Qanats. Qanats are water-supply systems in arid areas often several kilometers long, consisting of underground channels leading water from a mountain to the nearby village or city for irrigation or domestic use.

In the past, the city was covered with gardens, and Shiraz was known as a garden city. In modern times, only the gardens in a small region in the northwest area of the city known as “Ghasr-Dasht” have survived (Figure 1). Ghasr-Dasht is one of the oldest neighborhoods in the city, located in the northwest area of Shiraz. The old residents of Shiraz called this region the “juice bar of the city” because of its abundant orchards, which cover hundreds of hectares. Until about thirty years ago the Ghasr-Dasht region was considered part of the Shiraz suburbs, and was mainly used by Shiraz capitalists as countryside during the summer. In recent decades, as a result of changes in the structure of the city, Ghasr-Dasht underwent urbanization, and lost a great deal of its gardens during this development period. Today the remaining gardens are still being degraded and destroyed.

These precious gardens, which once acted as a barrier to rapid urban growth in the city’s development plan, are now becoming victims of this rapid development. Although the environmental problems of Shiraz are not as severe as those of metropolitan areas like Tehran, the current trend suggests it will soon face a similar dilemma. A closer look at the

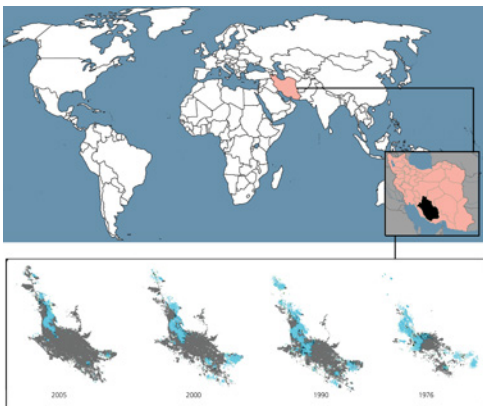


FIGURE 1  
SANAZ CHAMANARA AND AMIRREZA KAZEMEINI | DEVELOPMENT OF SHIRAZ  
CITY AND DESTROYING THE URBAN GARDENS

evolution of the garden area in Shiraz during the previous decades shows how gardens have been swallowed by urban developments. Reduction of green space is equivalent to creating undesirable places, increasing pollution, and contributing to the environmental crisis. Many mental diseases in large cities are due to lack of green space, uniformity, and cities devoid of soul. Today, the remains of the Ghasr-Dasht gardens are the only remaining ecological elements of the city. So the need for their maintenance and extension—to achieve urban sustainable development—is highly urgent.

## THE NEED TO MAINTAIN AND DEVELOP THE GARDENS OF GHASR-DASHT

Historically, cities formed based on immediate access to resources such as food. Cities were initially intended to develop on fertile lands that have rich soil for farming, because soil fertility allows for more trading and economic opportunities. Later, the industrial revolutions and advances in transportation technology changed the urban landscape. Rapid industrialization and heterogeneous urban growth—due to rapid population growth and migration from rural areas to industrial cities—destroyed large areas of agricultural land and urban gardens, with real consequences for the environment. In recent decades, heavy migration to urban areas from war zones has exacerbated this trend in Iran. One of the problems facing the developing world's urban population is the increasing size of the workforce, due to a growing younger population and insufficient job opportunities in the labor market. Production and consumption inequality in developing countries is one of the principal weaknesses of their policies, as a small

number of developed cities hinder the growth of the smaller ones, and most resources are concentrated in these urban areas. As a result, there is an increase in the flow of migration from rural areas to industrial cities.

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In recent years, environmental and economic crises in developing countries have led to strategies for sustainable urban development. One of these proposed strategies is the Continuous Productive Urban Landscape (CPUL) approach, which emphasizes reorienting urban farming, gardening, and water management toward dealing with specific environmental and economic problems. These ideas aim to increase cohesion of productive landscapes in the cities as a stage for sustainable urban infrastructure, with the idea of creating multi-functional urban open networks that protect the urban environment and make it complete and coherent. This policy does not treat the urban fabric as a blank slate, and the purpose is not to remove the urban context. The main purpose of this strategy is the protection of urban natural resources. With proper use of city resources, CPUL can provide some of the food needed for residents, raising the quality of the urban environment and preventing the destruction of natural resources. In creating new job opportunities, the city can realize the social and economic dimensions of sustainable



FIGURE 2  
SANAZ CHAMANARA AND AMIRREZA KAZEMEINI | ACTIVE AND INACTIVE GARDENS OF "GHASR-DASHT" NEIGHBORHOOD

development. Cities applying this policy face a long road to full self-sufficiency, but imports to these cities generally will decrease greatly. This will help bring about food security during times of food severity and other harsh situations in the city.

The Ghasr-Dasht gardens have resisted the destruction and transformation of the urban structures, but one can easily witness their partial destruction and change of use in the course of the last few years (Figure 2).

Before 1970, the gardens functioned as self-sustained biological systems. Production activities such as agriculture and ranching provided for the costs of living in the region, and gardening was a source of income for the Ghasr-Dasht population. In addition, the existence of Shiraz—a major nearby population hub—provided insurance and incentive for productive activities in the region. However, the development of new vehicular roads between major cities in Iran brought a variety of agricultural products to the Shiraz market from other cities. Due to this new transportation system, Ghasr-Dasht faced difficult competition, which affect its security and eventually harmed its productivity. Following these changes, the income of landowners and farmers declined, and the economic system of the gardens fell

apart. Through the physical growth of the city and construction of new roads, the Ghasr-Dasht gardens lost their uniformity, and new residential developments were built inside and at their peripheries. In terms of agricultural production, the gardens gradually lost their agricultural potential, and gardening soon was performed at a very limited scale.

## SHIRAZ URBAN DEVELOPMENT AND DESTRUCTION OF THE GHASR-DASHT GARDENS

Two trends have influenced Shiraz's urban growth: linear growth in a northwestern-southeastern direction, following the natural course of rivers, mountains, and plains; and core growth starting at the old town and expanding outward. The farmland and gardens of Ghasr-Dasht are located on the northwestern side of town, benefiting from favorable environmental conditions, but also lying along the linear development of the city. About a century ago, when Shiraz measured 300 to 500 hectares, the foothill gardens of Ghasr-Dasht had an area of 3,000 to 3,500 acres. The rapid population growth and subsequent rapid development destroyed half of the orchards during the period from 1952 to 1981. In general, the degradation of

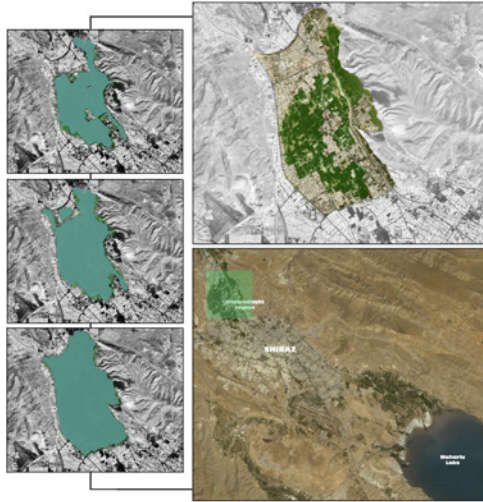


FIGURE 3  
SANAZ CHAMANARA AND AMIRREZA KAZEMEINI | THE DESTRUCTION OF THE ORCHARDS OF "GHASR-DASHT" IN SHIRAZ URBAN DEVELOPMENT

these gardens in the last decades can be divided into three periods (Figure 3):

*First period (1941-1961):* The city's expansion after 1941 was mainly around the historical district and southern fringes. This part of town, which is now part of the central metropolitan area, has a high population and construction density. Subsequent construction was scattered among the Ghasr-Dasht orchards and farms.

*Second period (1961-1979):* In 1962, the University of Tehran prepared the first comprehensive plan for Shiraz. Prior to this, development of the city had continued from the core, with a trend towards the northwest. The comprehensive plan set a legal limit of construction for 25 years in order to preserve and restore the Ghasr-Dasht gardens. The university introduced approximately 2,000 hectares outside the

scope of the comprehensive plan, with certain standards set to maintain them. Among the protection policies were plans for preventing separation and division of the gardens, purchasing them from owners for municipal acquisition, and converting them to urban parks. However, the destruction and separation of the gardens, as well as their conversion into residential units, were clearly noticeable.

*Third period (1979-present):* During this period, the Ghasr-Dasht gardens were purposefully destroyed for construction. In addition, the University of Tehran approved a revision to the comprehensive plan of Shiraz for better protection of these gardens. The gardens were declared special protected regions by this proposal. These measures provided some opportunities for environmental planning, and for the better use of this wealth for provision of public space. Though not as rapid, the destruction of city gardens during this period is still quite evident.

## FACTORS AFFECTING DEGRADATION OF THE GHASR-DASHT GARDENS

### URBAN DEVELOPMENT DUE TO THE INCREASE IN LAND VALUE IN THE GHASR-DASHT REGION

One of the most important factors influencing the inactivity of urban gardens and farms, and thus leading to their destruction, is their high value. This entices the owners to sell them for profit, which eventually result in their conversion into apartments and commercial centers. These problems are more vigorously in progress in the Ghasr-Dasht gardens due

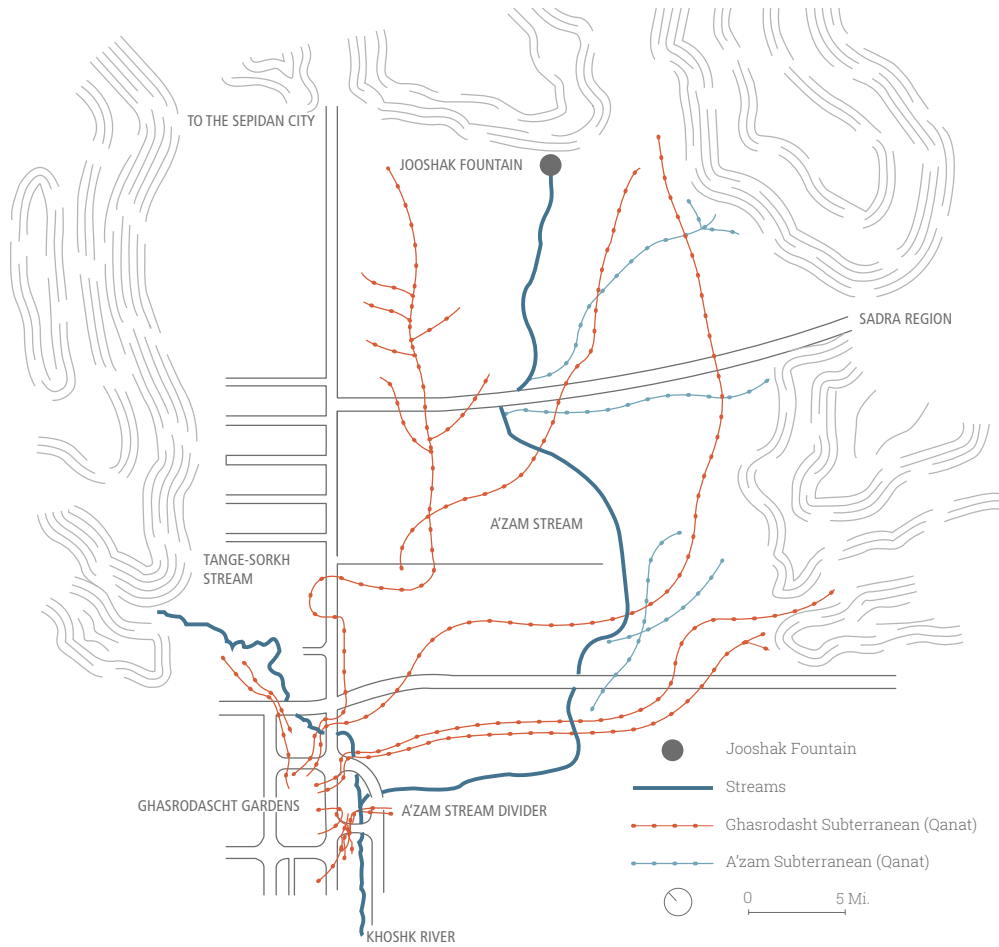


FIGURE 4  
SHIRAZ MUNICIPALITY, WATER RESOURCES OF "GHASR-DASHT" GARDENS

to factors affecting their productivity as well as their economic value. Accordingly, during research studies, urban land-related legislation and regulations for preserving agricultural lands and orchards were reviewed, and some fundamental problems in the legislation were clearly noticed. The goal of this proposal (the protection and sustainable development of Shiraz's city gardens) is only achievable if these

laws and regulations are properly modified. The first step in this regard is to rehabilitate the gardens that are pending destruction or have been divided, and then restore them to their original state. In the next phase productive landscapes should be developed in the city. To motivate the owners, providing services for the owners and farmers should be codified in current rules and regulations. In this way, not

only will the gardens be maintained, but the brownfields and vacant lands around them will also gradually develop into productive landscapes. This process is possible only if local residents want to get involved. Therefore, to create interest and motivation among Ghasr-Dasht residents and Shiraz residents in general, incentives must be considered as part of the regulations.

### **COLLAPSE OF THE GARDENS' ECONOMIC SYSTEM**

One of the most influential factors in the gardens' destruction is a lack of economic gains for landowners in recent years, mainly as a result of a dearth of farmers' markets and use of outdated methods of agriculture, which allow pests and cold weather to impact the gardens. Another major problem in the gardens of Shiraz, and particularly in the area of Ghasr-Dasht, is the use of chemical pesticides on a large scale, which causes air pollution in the region. In response, the Shiraz municipality decided to replace the trees in the region with unproductive alternative trees, neglecting the economic benefits of the gardens. As a result the owners, seeking more profits, have been turning their gardens into residential sites.

### **DEGRADATION OF GHASR-DASHT WATER RESOURCES**

The durability and survival of the Ghasr-Dasht gardens greatly depend on their water resources. Generally, water resources of the gardens are divided into two categories: permanent and seasonal. Permanent water sources consist of 26 Qanats and "welding fountains." Two rivers from the northwest, the Great Creek and the Red River, feed into the orchards zone. These two rivers join together

and form the seasonal Dry River. Welding fountains are the main resource and provider of the Great Creek. Its runoff provides part of the seasonal sources of water for the irrigation of the Ghasr-Dasht gardens (Figure 4). Important factors contributing to the degradation of Qanats and the water shortage in the gardens are the construction of nearby houses and streets; high land prices relative to the price of garden products, and thus reluctance of owners to make repairs; lack of ability to pay for renovated and restored Qanats; and lack of a management system.

### **IMPROPER DISTRIBUTION OF URBAN SERVICES IN THE REGION**

An important factor influencing the destruction of the Ghasr-Dasht gardens is the improper distribution of services, leading to replacement of many gardens along the main roads with urban service uses. The street networks in Shiraz have not yet entered the garden lands, and the gardens are still connected by auxiliary lanes and alleys with low traffic. Due to the development of transportation within the region in recent years, it is possible that more of the gardens will be destroyed and used for urban services. Multi-functional urban landscapes are a good candidate for addressing this problem. Failure to provide hierarchical access to gardens and farms in the area is another problem in the Ghasr-Dasht region. The main streets in the Ghasr-Dasht region are wide enough to allow for heavy traffic and thus are unsafe for pedestrians. Therefore, a proper, hierarchical distribution of land, taking into account the comfort and safety of pedestrians, should be considered in the District Strategic Plan.



## A TRANSFER OF DEVELOPMENT RIGHTS APPROACH

In order to revive the productive landscape of today's cities, the consideration of the Transfer of Development Rights (TDR) approach is necessary, assuming sufficient land value and the willingness of residents. In this approach, areas designated for protection are specified as "sending areas," and urban development in these areas is slowed or completely stopped. The rights are transferred to areas that are more suitable for growth in the city, designated

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as "receiving areas." TDR, a market-driven approach, creates a context in which urban development is transferred to lands more appropriate for development. In fact, application of TDR encourages interested landowners to voluntarily waive future development rights on their property, and gives them the option to sell the transferable development rights. Based on this method, the owners sign limitation documents and then are able to sell their property and earn compensation for any reduced value of their land (Pruetz & Standridge, 2008; Barrows & Bruce, 1975).

If landowners are not willing to accept TDR, they would only have rights to construct at a lower density, but if owners exercise these

rights, they would be allowed to construct at higher densities. Therefore, they would obtain financial benefits, be encouraged to support productive landscapes in the city, and help protect the urban environment. The United States pioneered this technique in New Jersey in two townships, Lumberton and Chesterfield, in 1989, resulting in the preservation of more than 3,000 acres of farm and forest lands, accompanied by the development of hundreds of new residential units (Renard, 2007).

The development of these productive landscapes in Shiraz will be possible only through interaction and collaboration with citizens while respecting their rights, with government playing a major role. In order to maintain and develop the Ghasr-Dasht gardens, the first stage is to consider them to be areas with potential for protecting the city and try to restore the remaining gardens, and then try to extend these landscapes.

Based on prior studies and successful international experiences in this field, the purpose of the following Ghasr-Dasht region strategic plan is to protect the gardens' remaining productive landscapes, develop these landscapes into green infrastructure for the city of Shiraz, and restore the multi-functionality of the city's urban landscapes. The suggested guidelines are as follows:

### ECONOMIC STRATEGIES:

**Purpose:** Modification of rules and regulations in order to restore urban gardens and expand them into the city.

*Active farms and gardens:* The formation of organizations with the purpose of



attracting public participation in active areas, through workshops and training sessions demonstrating the TDR approach, would create motivation for preservation of these areas. Division of gardens and agricultural land should remain at minimum levels, consider local climate and customs, and not result in lands with areas lower than 2,000 meters squared, the minimum land area for gardening and agriculture. In order to encourage citizens to participate in the development of productive landscapes, we recommend constructing tourist sites and other services in these areas, while at the same time avoiding logging. The owners of productive landscapes should be exempt from the related taxes for side renovation, side streets, and development of the productive landscapes. It is also important to establish agricultural markets offering natural and organic products at several points in the area to assure owners that their products will have a market.

*Barren and inactive lands:* Following the TDR approach, and raising awareness of this approach among owners of inactive lands, is important. We recommend motivating landowners who tend to develop in these areas to buy the development rights only, granting them higher-density construction rights elsewhere and exempting them from related taxes. According to regulations, gardens with an area of less than 500 meters square can be destroyed. Therefore, gardens that have been divided and separated for any reason in the past must be aggregated in a unified garden. Combining homes with gardens would encourage landowners to develop toward a continuous productive landscape. If necessary, the municipality

should have priority for purchasing vacant lands and changing them into multifunctional landscapes, taking into account traffic factors.

## ECOLOGICAL STRATEGIES:

**Purpose:** Protection of valuable resources of urban ecological landscapes, and increasing the environmental quality of the city of Shiraz.

*Water resources:* Maintenance of the Qanats should involve collaboration with residents and the management of the Shiraz municipality, taking into account yearly maintenance costs. Setting up fences would shield the Qanats from construction, and will prevent disposal of their surface. Planting in the path of Qanats and preventing urban construction on them would prevent discharge of sewage of neighboring villages of the Great Creek into the river. The Dry River floor should undergo dredging in order to restore it to its natural state and provide a constant flow of water. Improving the irrigation methods for the gardens using recycled water and sending the Qanats' excess water to the "Dry River" are also important issues that should be taken into account in order to revive the development of productive landscapes in Shiraz.

*Agricultural methods:* To prevent contamination of the region, it is important to replace traditional planting and chemical pesticides with organic planting. Organic agriculture is a holistic production management system that improves ecosystem health by maintaining and enhancing biodiversity and the soil's biological activity. These systems take the

regional climate into consideration and emphasize the use of environmentally friendly methods. In order to fight pests, which is one of the major problems in this area, using crop rotation methods and vegetation appropriate for the climate in the barren lands should be considered. Designing farmers' markets in order to attract resident attention to urban agriculture and implementation of advanced planting and irrigation methods are also essential steps for sustainable urban development.

## STRUCTURAL STRATEGIES:

**Purpose:** Improving the appearance of city landscapes and restoring gardens as part of the natural-historic identity of the garden city of Shiraz.

To protect Ghasr-Dasht, it is important to view the region as beneficial for Shiraz's climate, and to design green buffers and eco-paths in order to prevent the extension of residential areas into the gardens. Providing incentives for creation of green roofs and facades, promoting ecological uniformity of the region, controlling the density of buildings, and creating views from surrounding areas into the gardens by removing visual barriers are important issues that must be addressed. Critical strategies also include using recycled materials to reconstruct the region, installing pervious surfaces instead of asphalt for open spaces of urban areas, and properly distributing urban services to promote multi-functional, effective landscapes at inactive locations in the region.

Proper design of hierarchical access to gardens would create pedestrian-friendly paths between the gardens and the alleys. Placing emphasis on the local historical sites in the landscape, and reconstruction and maintenance of productive streets, would maintain respect for the identity and culture of Shiraz. Highways should be transferred to the east, outside of the gardens region. Finally, distribution of urban services at the edge of the city's main streets such as restaurants, sports centers, and recreational spaces should align with traffic patterns.

## CONCLUSION

Formation and evolution of the traditional Iranian towns surrounded by farmland and gardens as a living body has been a very slow process, spanning centuries. But rapid urbanization and a dramatic increase in the evolution of cities in the industrialization period have led to many environmental, social, and economic problems in civil society, and have resulted in the loss of cities' identity. Some approaches have been proposed to deal with these problems, among which sustainable urban development seems to be an effective model. Shiraz is one of Iran's oldest cities and an important historical, cultural, social, and economic center. The city was once covered with multifunctional orchards due to a very hospitable climate, fertile soil, and plenty of Qanats for irrigation. But in subsequent centuries, as a result of rapid urban growth, most of the gardens were replaced by urban structures, and now Shiraz is faced with the critical problem of urban poverty.

This paper proposes strategies for the organized management of gardens and water resources in the Ghasr-Dasht gardens, considering the

"transfer of development rights" approach, which represents an innovative way to direct growth away from critical city areas, toward areas better suited for higher-density development. By studying the specific character of each region and designating gardens as sending areas, a market-oriented approach can

protect the productive landscape, as well as its visual aesthetic and a number of plant species. Although the Ghasr-Dasht gardens are used as a case study, the rehabilitation principles proposed here can be applied to other urban gardens with similar characteristics. ■

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