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# Necessity to Use of Medicinal Plants and Compatible Fruit Trees in Vacant and Replacing Urban and Rural Greenery in Low Water Areas

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## ABSTRACT

The phenomenon of water scarcity has been one of the biggest problems in human life for decades. Nowadays, in many cities of water-scarce regions of the world, pay attention to water-scarce and attractive urban landscapes by using natural spaces and suitable ecological conditions, using the design and implementation of water-scarce urban green spaces by reducing water consumption has become very important. Considering Iran's hot and dry climate, global temperature increase, consecutive droughts and water resource supply limitations, the necessity of research and finding scientific and practical strategies for dry landscaping and the design of urban green spaces with economic goals and the sustainability of green spaces should be suitable with maximum water saving and optimal water consumption.

***Keywords****:* Medicinal plants, Greenery, Water scarcity.

## INTRODUCTION

More than half of the world's population reside in cities, as it is increasing every day and a large part of the world's population moves from rural to urban areas.

The increasing demand for water with water scarcity and lack of water resources has been one of the biggest problems in human life for decades (Belhassan, 2021). Climate change, one of the dimensions of which is the lack of water due to the decrease in rainfall, the drop in underground water and the decrease in water supply sources, certainly it has many effects on

ecological sustainability, urban life and civilization (Kumar, 2012). Nowadays, in many cities of water-scarce regions of the world, paying attention to water-scarce and attractive urban landscapes by using natural spaces and ecological conditions, by using the design and implementation of water-scarce urban green spaces by reducing water consumption, has become very important (Almeida, 2006).

The approach of quantitative development of green spaces in most Iranian cities in the past years has led to the creation of parks and artificial green spaces with high water consumption and high maintenance costs. Most of these parks and green spaces are filled with imported plants and trees, mostly incompatible with the climate and culture of cities and their modeling is mostly based on the English parks of the 19th and 20th centuries. So that the maintenance of these green spaces has made the cities of Iran very consuming, unstable and expensive (Akhani, 2022). Considering Iran's hot and dry climate, global temperature increase, consecutive droughts and water resource supply limitations, the necessity of research and finding scientific and practical strategies for dry landscaping and the design of urban green spaces with economic goals and the sustainability of green spaces should be suitable with maximum water saving and optimal water consumption (Russo and Cirella, 2018). Large areas of the country are developing, and due to the increase in water consumption and the decrease in water resources and underground resources, it is necessary to design and stabilize the most green spaces in these cities with the minimum required water Rijsberman, 2006; Szalińska and Tokarczyk, 2021). According to these conditions, a sustainable and compatible landscape design with environmental limitations and effects should be considered with the maximum use of the climatic capacities of each region. So that effective design and management in optimal water consumption seems necessary to minimize the effects of water scarcity and drought.

Therefore, in this landscaping research, from the combination of recovery of native species as well as identification and use of compatible and acceptable species of other similar cities (climate and soil) inside and outside the country with the priority of saving water consumption and other economic goals and the ecology of each city and region can be mentioned.

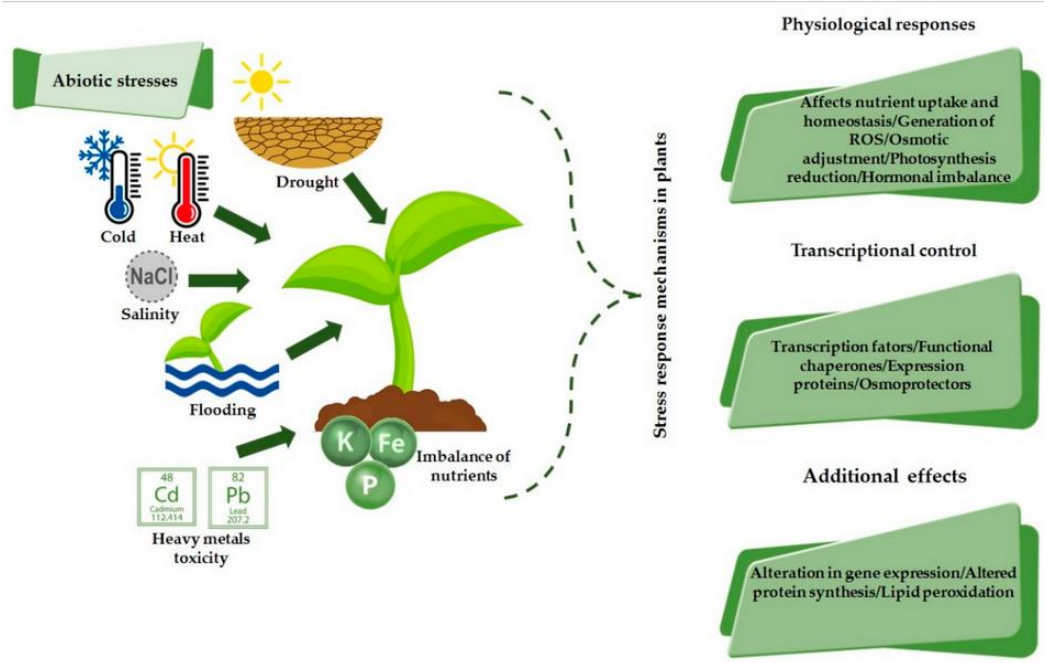


Figure 1. Plant response cascade to different abiotic stresses (Castronovo *et al.*, 2020).

## RESEARCH METHODS

This research is qualitative descriptive research, according to the practical purpose, in terms of methodology. In this study, by searching in library sources and databases (Irandoc, SID, Scoops, Google Scholar, PubMed and Web of Science) we have tried to find the necessary information related to the recovery and innovation in medicinal plants for low water, beautiful and sustainable urban landscapes.

## RESULTS AND DISCUSSION

### *Biological and cultural diversity of urban green spaces*

Biological and cultural diversity of developing cities and drylands regions is decreasing sharply. About one third of the earth's surface is dry land. Drylands have unique biological and cultural diversity and host many native species, including wild relatives of key crop plants and host many native species, including wild relatives of key crop plants. However, extensive agriculture, well drilling beyond the region's capacity, unsustainable use, and global climate change are causing irreparable damage to parched lands, with far-reaching consequences for species, groundwater resources, ecosystem productivity, and ultimately communities dependent on these systems (Zhang *et al.*, 2022; Aronson *et al.*, 2017). Surveys show that practitioners, policy makers and current researchers lack complete and practical knowledge about the specific environmental effects of climate and environmental changes on cities and residential areas. The current situation requires the joint efforts of scientists,

researchers, practitioners, policy makers and local communities to adopt a socio-ecological approach to achieve sustainable development in cities and drylands. Applying accurate geographic information systems, integrated vision, scientific initiatives and ideas and new careers at the global, national and regional levels, tt is necessary for the green space and the ecosystem around them by maintaining the biodiversity of the dry lands and the vital ecological services they provide for their survival and future generations (Kosanic *et al*., 2022; Ruiz *et al*., 2021).

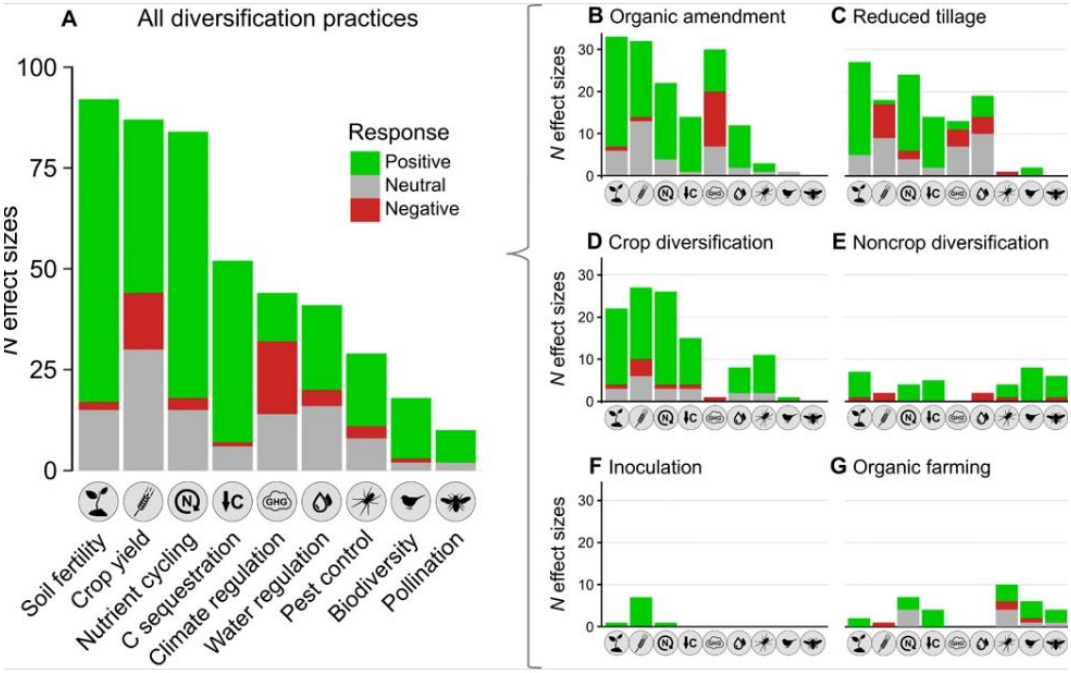


Figure 2. Vote count reveals that agricultural diversification practices generally have a positive impact on biodiversity and ecosystem services. Number of reported effect sizes with a significant positive (green), negative (red), or neutral (gray) response to agricultural diversification, overall (A) and to each category of diversification practice separately (B to G), (Tamburini *et al*., 2020).

### *Sustainable urban green spaces using medicinal and productive plants and compatible native plants*

In response to development challenges as well as global social and environmental needs, the production of medicinal and urban garden plants and indigenous species neglected, it can encourage and increase the value of urban green space and its ecosystem services, the increase of individual cultivation and gardening and social participation (Ljubojević *et al*., 2021). For a useful and sustainable urban green space, it should be done in such a way that the conditions for operationalizing criteria and indicators compatible with the climate and approaches to sustainable economic, environmental and ecosystem services development (Phondani *et al.*, 2016).

In the selection of medicinal plants and fruit trees for the urban green space, it is necessary to observe various parameters, including conditions and characteristics such as: In terms of weather tolerable (temperature, humidity and rainfall), multiple use value (ecological, economic, and medicinal), cultural ecosystem services, preservation of native and valuable landscapes, production of pharmaceutical and food products (Plieninger *et al.*, 2015; Cousins *et al*., 2015), biodiversity and promotion of urban ecosystem services (Schwarz, *et al.*, 2015), environmental, social, economic, human aspects and sustainability policies (Phondani *et al.*, 2016; Plieninger *et al.*, 2015).

Hence, this review highlights the potential of using medicinal and indigenous plants to solve related problems, food security, livelihood strategies, protection of useful plants, prevention of destruction of urban ecosystems and protection of urban green spaces, while the increasing number of problems should be monitored and identify potential challenges and the important social and environmental role should not be neglected in the effect of rapid population growth and urbanization, the increasing destruction of the environment on a large scale and global climate changes, increasing destruction of the environment on a large scale and global climate change should not be ignored (Cousins *et al*., 2015; Cohen *et al.*, 2006).

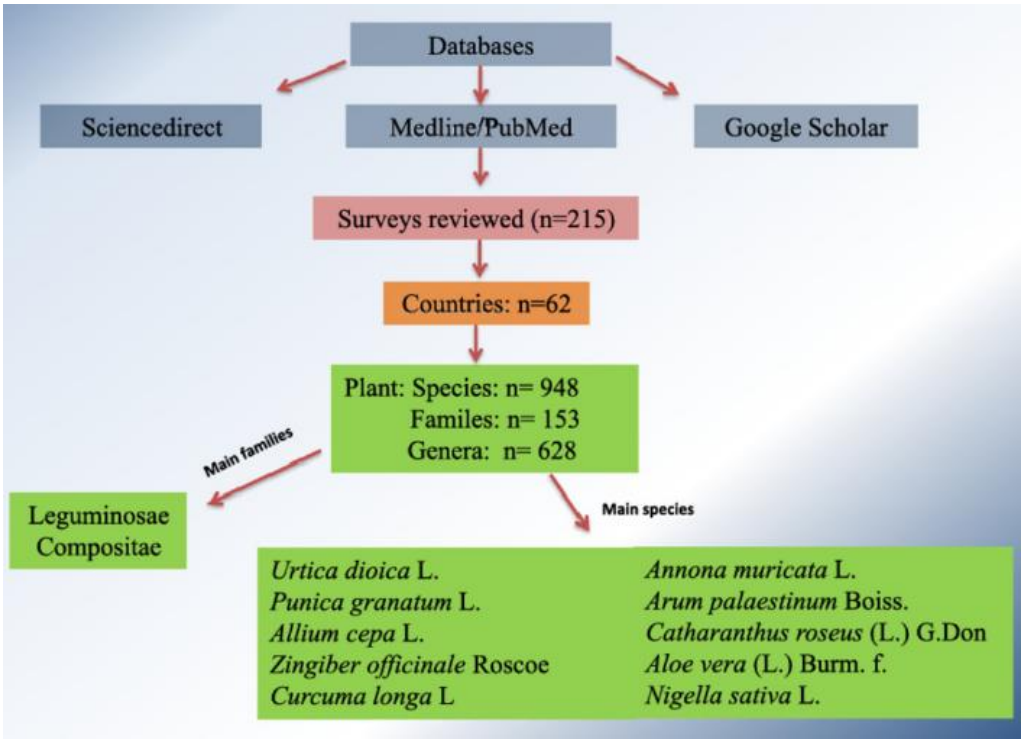


Figure 3. Traditional medicinal plants for cancer management (Aumeeruddy *et al*., 2020).

***The importance of medicinal plants in urban green spaces***

1. Recovery and restoration of sustainable native species and attractive socially and economically.

2. Creating beauty and diversity, by identifying and using plants and trees from other regions (inside and abroad) with the same climate and soil of each city and region.

3. Reducing and saving water consumption.

4. Saving resources and reducing costs by preserving the natural environment.

5. Reducing the consumption of chemicals and environmental pollutants (in addition to reducing the costs related to the consumption of fertilizers and chemical poisons, the amount of leaching and penetration of these substances into the underground water tables and soil is also reduced).

6. Reducing costs related to the maintenance of green spaces in cities.

7 Examining and presenting a combination of successful global city projects (extraction of solutions and actions used and successful in the world with the solution of low water and beautiful landscaping instead of water-consuming green spaces).

8. Reduction and control of urban water runoff and flooding of roads resulting from rainfall and irrigation of green spaces

9. Creation of tourism and ecotourism attractions (with regard to innovation and creativity in designing and creating landscapes of medicinal plants and fruit trees in the flowering and harvesting seasons of gardens and farms created locally, culturally and socially with a family fun atmosphere).

10. Designing and creating small pieces of land in unused parks, to give or rent to retirees and those interested to plant and harvest medicinal and economic plants and prepare a comprehensive database of the city's green space.

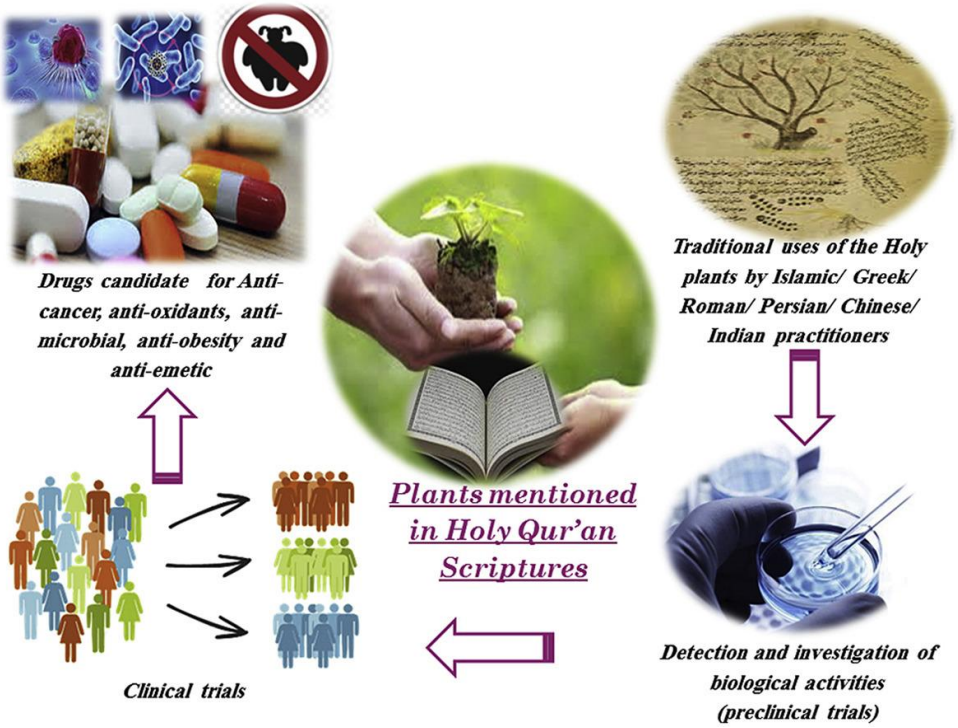


Figure 4. Plants mentioned in the Islamic Scriptures (Holy Qur'ân and Ahadith): Traditional uses and medicinal importance in contemporary times (El-Seedi *et al*., 2019).

## CONCLUSION

In the most parks of towns and villages of Iran, by creating non-native and incompatible artificial green spaces, It has caused high water consumption along with high maintenance costs. So that an unstable trend towards dryness and gradual deterioration of green spaces is observed. Therefore, to deal with these environmental, climatic and water shortage crises in urban and rural areas, It seems necessary to move towards natural and beautiful green spaces suitable to the climate and conditions of the region, which have the ability to restore and return to near-natural conditions. As a result, the use of diverse and compatible medicinal plants and indigenous plants is a suitable solution to deal with ecological challenges and destructive tensions in the green spaces of cities and villages.

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