

Original Research Article

A Dryland Landscape or a Rainfed Landscape? Which Concept is Xeriscape Closer to?*

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Abstract | A careful selection of jargon is of great importance in the scientific arena as ambiguity or semantic discrepancy can cause misunderstanding and failure in promoting accurate concepts. An example of this is 'Xeriscape', an approach to landscape design in hot and dry climates based on seven principles. The purpose of this approach is to optimize landscape irrigation by maintaining the greenery and dynamism of the landscape. However, due to inaccurate translations and misconceptions, this approach has been misrepresented as a 'Dry Landscape', which evokes an image in contrast to its original nature. 'Deym Kari' which is translated as 'Rainfed Farming', is culturally entangled in the vernacular agriculture of Iran and reflects an adaptation to the hot and dry climate employing diverse water resources in coexistence with nature for centuries. This study attempts to conceptualize 'Xeriscape' accurately, by comparing it with its equivalents 'Dry Landscape' and 'Rainfed Farming'. In doing so, this research hopes to introduce a more appropriate equivalent for 'Xeriscape' in Persian landscape design literature, portray a comprehensive picture of this approach, and change the misconception of 'Dry Landscape' to 'Rainfed landscape' or sustainable green landscape. For this purpose, this study employed comparative and content analysis methods to scrutinize the concepts of 'Xeriscape', 'Dry Landscape', and 'Rainfed Farming' in the source (English) and target (Persian) languages. Available studies demonstrate that the principles of 'Xeriscape' are significantly aligned with the concept of 'Rainfed Farming' in Iranian gardens. This study hopes to serve as a fundamental milestone towards promoting new approaches to landscape design compatible with Iran's climatic and cultural conditions and significantly contribute to enhancing the quality of open spaces and the urban environment. In addition, it is hoped that the results of the study to contribute to developing guidelines and standards for sustainable landscape design in hot and dry climates.

Keywords | *Xeriscape, Dry Landscape, Hot and Dry Climate, RainFed Farming.*

Introduction | Term selection refers to a process by which a term is selected or created for any specific concept such as technical, professional, or artistic. The selection of an appropriate word, which requires matching the term with existing terminology in scientific texts, facilitates better communication among specialists and makes the teaching of science easier (Kasravi & Hashemi Zadegan, 2023). Given climate change and global warming, new approaches to designing green spaces and urban landscapes have emerged. Among these approaches, which have been proposed in the United States since the 1980s, Xeriscape, the landscape design with plants more resistant to water

scarcities and heat emerged in English, and the term 'dry landscape' in Persian, is used as an equivalent for this approach, and some experts in the fields of landscape, green space, gardening, and all disciplines related to environmental design use the term dry landscape. Such literal translation seems to have not taken into account the nature of the landscape. The question is whether this approach stands for dry landscapes.

To carry out this research, some questions were raised: What are the seven principles of Xeriscape? To what extent does what is introduced today as Xeriscape or in Persian, dry landscape stand in harmony with the principles of rainfed farming? What is irrigation like in Xeriscape landscaping

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and is the landscape resulting from Xeriscape the same as a dry landscape?

Responding to these questions can provide a better insight into the conceptualization of this term and help find a more accurate Persian equivalent. As Xeriscape is an approach in landscaping, its accurate understanding, can be used in all landscapes. Disregarding natural water resources in the urban development process can have adverse consequences on the economic, environmental, and aesthetic aspects of the city and, consequently, affect the rights of future generations and the hydrological water cycle (Ramezani & Habibi, 2021).

Literature Review

Much has been conducted on the effectiveness and application of the seven principles of Xeriscape. Knopf (1991) examined Xeriscape from different perspectives such as environmental, economic, and aesthetic. In a national project titled YARDX between 1997 and 2002, Xeriscape was used to enhance the efficiency of low-water landscaping, reduce water consumption costs, and annual implementation and keep maintenance of traditional landscapes and low-water landscaping (Medina & Gumper, 2004). It was proposed for the first time in 2004 by the Colorado Contractors Association to increase water utilization in landscapes with low water consumption (Ingels, 2004). Welsh et al (2007) examined the amount of water consumption of plants using this approach. Wright Water Engineers (2008) examined the effect of this approach in the irrigation of green spaces in the California climate-based irrigation control project over four years. Gary et al (2010) developed the seven principles for landscape and set a guideline for the proper use of this approach, and they claimed that if this approach was studied systematically, it could reduce water consumption by up to 50%. Rayno (2014) studied the positive impact of Xeriscape landscapes on the rise of house prices. Nasser (2016) detailed the principles of Xeriscape and its role in urban landscape design in his book named 'Optimizing Water Consumption in Urban Green Spaces with a Low-Water Landscaping Approach (Xeriscape)'. Kafi (2014) compared the seven principles of Xeriscape with the principles of Iranian garden design and also found that these principles were properly deployed in gardening in their ancient history. Khojlo (2009) examined plants suitable for landscape design in hot and dry areas in his book 'Gardening in Low-Water Areas in Plain Language'. Golchin & Farhadi (2014) in their book 'Xeriscape: A Suitable Approach for Developing Low-Water Landscaping', examined the seven principles, definitions, foundations, and compatible plants. Kasravi and Hashemizadegan (2023) also detailed the importance of specifying the word 'Manzar' in Persian

in their article 'A Comparative Study of Sima, Manzar, and Gesham Andaz as the Persian Equivalents of the English 'Landscape'

Reviewing the previous studies highlights two important points. Firstly, the dominant approaches have focused on the degree of impact and success. A series of research has examined the definition of the seven principles of Xeriscape. Less research has investigated the reasons for the formation of Xeriscape and focused on its local equivalent. This study compares the principles of rainfed and Xeriscape to show whether the components of Xeriscape 'Xero ' meaning Dry and the word scape in Persian 'Manzar', offer an accurate equivalent and whether it makes sense for an Iranian specialist.

Methodology

This article is theoretical in terms of its purpose. A comparative analysis was carried out to find the Persian equivalent of Xeriscape. For this purpose, the discrepancies and similarities between the translation and the original term were compared. The data were collected through the documentary literature review method from relevant books and references, focusing on the definitions and characteristics of the two concepts of xeriscape in Latin and rainfed agriculture in Persian. In this study, two terms were compared using a critical method, and their similarities and differences were presented. The common concept of 'dry landscape' was criticized and its inadequacy in the scientific language of related disciplines was analyzed.

Theoretical Foundations

The language of science, as a tool for scientific discourse, plays a key role in the development of scientific ideas, and these two elements are considered essential for scientific development. The importance of paying attention to a special variety of Persian languages, known as the scientific variety, is confirmed by all experts in the field of culture and language in the country. Encountering foreign scientific terms and concepts, along with the need to express domestic scientific achievements in Persian, highlights the necessity of strengthening this language variety (Dehghanzadeh et al., 2020). Borrowing is one of the methods of vocabulary development in a language that takes place through the adoption of lexical elements from other languages or dialects. This process includes various types:

Direct loan: The term enters the language remains unchanged and adapts to its grammatical structure, such as football.

Loan translation: The structure of the borrowed term is literally translated into the native language, for example, Asman Kharash is the equivalent of the

skyscraper in English. **Loan interpretation:** it refers to an interpretation or equivalent that was developed in the target language rather than the native language for example: Jaroo Barghi in Persian for vacuum cleaner.

Loan translation and interpretation: Part of the borrowed term is directly translated while the other is interpreted based on the meaning, such as greenhouse.

Loan blend: In this type of borrowing, a component of a term is imported directly from the lending language while the other part is replaced by a native word, such as physicist, which is a combination of the Persian word Dan and the foreign word Physics.

Loan exchange: In some cases, a term from a language that is more closely related to the loan language is replaced by a word from a more foreign language, such as Zabt-E- Sot in Persian or audio recorder, which is imported into Persian instead of Western equivalents.

However, in some cases, word coinage offers a more appropriate solution than borrowing. Extratextual word coinage is done by experts or individuals who consider themselves competent to do so. Examples of this type of coinage include “Door Negar” (Farangestan) and “Amadgari” (Dariush Ashub).

Intratextual word coinage is done by translators, writers, teachers, and other people who need a new word for new concepts or objects. An example of this type of coinage is ‘Structure’ proposed by Mohammad Reza Batani.

Haghshenas (1977) offers Intratextual coinage as a basic solution to address the lack of vocabulary in the Persian language. The main advantage of this coinage is that it does not limit the production of terms because not a specific group of experts, but all content producers can contribute to the coinage. As a result, the range of words produced will be as wide as the new concepts entering the linguistic community. According to experts in the field of scientific language, using jargon that creates ambiguity in the target language or is not an appropriate description of the concept in the source language can lead to misunderstanding in the scientific language and its lack of promotion.

With this introduction and based on the aforementioned principles, the words Xeriscape, “Dryland” and the term “Dry farming” in the Persian language have been examined and compared, and suitable equivalents have been proposed to avoid any ambiguity and misunderstanding caused by these terms.

Conceptualization

Deym Kari (Rainfed farming): According to laypeople, rainfed farming refers to farming without irrigation and refers to solely rainfed agriculture. Therefore, it should not be considered only as agriculture without irrigation in dry and low-rainfall areas. In contrast, this type of farming

includes a set of pre-designed and complex agricultural techniques and management that are used to stabilize crop yield and provide sustainable income for farmers (Kazemi, 2008, 2).

Khoshki (Drought): It is believed that drought is a result of a lack of rainfall (Imani et al., 2000). Baro’s definition of “drylands” is “environments that are permanently, seasonally, or temporarily facing a significant lack of moisture” (Maingue, 1999). This term has a wide range of meanings that vary depending on culture and historical periods (Wescoat, 1996, 11). For most people, drought conceptually evokes an image of dry lands in the minds of the audience, which includes a variety of barren landscapes with poor vegetation and areas of sand and gravel (Ghiassee et al., 2020) (Table 1).

Xeriscape: is a term to refer to a type of landscaping that saves water (Weinstein, 1999). Xeriscape offers a creative solution to solving green space problems by reducing the need for supplemental irrigation in the landscape (Wescoat, 1996). The term was first used in 1981 when the Denver Water Authority and the Landscape Contractors Association came together to develop a program to use public participation to increase green space. The idea was quickly welcomed by other American states, and in 1986 the National Xeriscape Association was founded, which introduced the word ‘Xeroscape’ as its trademark (Sarami, 2012). Based on the definitions provided, it is explained why ‘Xeroscape’ is so close to the rainfed landscape.

Audience’s Perception of the Landscape and its Relationship with the Concepts of Drought, Xeriscape, and Rainfed Farming

• The concept of drought

A landscape can be discernable to an observer via its structural features as the perception of a landscape is associated with the interaction of evolutionary and biological processes occurring between its physical structure and the observer’s personal experience (Ghiassi et al., 2019). Therefore, when the term “dry landscape” is used, there must be an alignment between this term and its perception. In Table 2, the conceptualization of drought in different disciplines and their meanings are given. However, dry landscapes and dry concepts do not necessarily imply landscapes based on a Xeriscape, and using the equivalent of the dry landscape can be in contradiction with the audience’s perception.

• Is the xeriscape a dry landscape?

Based on the definitions section (Paragraph 3), does xeriscape imply dryness? Examining the opinions of experts can provide a better answer to this question. Based on the definitions presented, Xeriscape does not simply mean creating dry and waterless landscapes. This

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Table 1. Advantages of choosing a rainfed(Deym in Persian) landscape over a dry landscape. Source: Authors.

Description	Criteria
The word 'Drought' evokes images of severe water scarcity, infertility, and poor vegetation, while Xeriscape stands for sustainable, water-efficient landscape design, not necessarily a lifeless, dry environment.	Negative semantic connotation
The word 'Deym' in Persian refers to agriculture and plant growth without any artificial irrigation. This concept is very close to Xeriscape, which emphasizes the use of native and drought-resistant species. This means that the 'Manzar -e- Deym' or 'Rainfed Landscape' clearly demonstrates that this landscape design is based on climatic conditions and natural water resources.	Consistent with the concept of Rainfed agriculture
The <i>Manzar -e- Deym</i> 'has a sense of sustainability', vernacularism, and coexistence with nature, while a 'Dry Landscape' may evoke mental resistance and public disapproval as it connotes undesirable and lifeless spaces.	Improvement of cultural and aesthetic acceptance
<i>Xeriscape</i> means optimal water management in the landscape, not the elimination of water. The term 'Deym' better reflects this meaning since it emphasizes the use of climate-adapted and resilient species, rather than the complete elimination of irrigation. The term 'Deym' has its roots in Iranian agricultural tradition and has long been recognized as a way to utilize natural water resources. The selection of this term in Persian helps to preserve and strengthen the Persian language and creates a clear semantic connection between the past and the present.	Closer meaning

Table 2 . Dryness typology, Source: Authors

Definition	Typology
A dry climate is a type of climate with low rainfall that is not sufficient for the needs of plants (Ghiassi et al., 2019). Drought is a feature characterizing a type of permanent climate in a region that means the lack of sufficient rainfall (Mohammadi, 2013, 8). It means a low amount of rainfall in the region (Khalidi, 2015, 8).	Drought from a geographical perspective
Dry ecosystems consist of a mosaic structure with scattered and dense patches. Water scarcity has a direct impact on the growth and diversity of plant species, and in fact, water resource limitations cause the formation of symmetrical patterns in vegetation (Ghiassi et al., 2019). Vegetation patterns in dry ecosystems can be identified based on the shape and spatial distribution of vegetation. These patterns are usually described by two terms: tiger and leopard, each of which represents a specific type of plant distribution in these ecosystems, and in these landscapes, tiger versus leopard modification is considered, which represents the non-uniformity of vegetation in these substrates (Mander et al., 2017).	Drought from an ecosystem perspective
Dry landscapes have a thin layer of weak organic matter including a variable structure of clay, sand, and gravel. The processes of sedimentation and soil erosion, along with vegetation patterns, affect the physical condition of the topsoil. These factors ultimately lead to the formation of a texture with sparse vegetation and uniformity in the overall color and appearance of the landscape (Ghiassi et al., 2019).	Drought and morphology

approach offers a comprehensive strategy for designing and managing green spaces.

Extensive research in this field shows that Xeriscape is not directly associated with rock gardens or cactus gardens. Welsh & Welch (2007) believes that Xeriscape is an effective solution to reduce the need for supplemental irrigation in green spaces. Sarami (2012) also believes that this concept refers to green spaces requiring moderate

water and has no connection with dry and barren landscapes (Fig. 1).

As defined by the New Mexico Xeriscape Council in the United States (XCNM, 2011), Xeriscape as a concept is more than a specific garden design method. It is a general strategy for conserving water resources that can be applied to a variety of landscape designs, from natural to formal (Table 3).

• **Key elements of aesthetics in xeriscape**

Plant Diversity: Employing native and drought-tolerant plants, Xeriscape offers a unique variety of colors, textures, and forms. Colorful flowers, vegetation covers, beautiful trees, and shrubs all work together to create an eye-catching composition.

Smart Design: Xeriscape designs are based on zoning principles and attention to the water needs of plants. This, in addition to reducing water consumption, helps create balanced and harmonious landscapes.

Creating Natural Landscapes: By imitating natural landscapes, Xeriscape inspires a sense of pristineness and harmony with the environment. This method focuses on creating natural and sustainable spaces rather than creating artificial and designed landscapes.

In summary, the seven principles of Xeriscape include: planning and design, soil analysis, selection of appropriate plants, creating turf surfaces, optimal irrigation, using mulch or soil cover, and proper landscape maintenance (Table 4).

From an aesthetic and visual perspective, Welsh says:

“Xeriscape is a beautiful and creative solution to solving green space problems and reducing the need for supplemental irrigation in the landscape.” Welsh believes that Xeriscape has nothing to do with dry, rocky gardens and these landscapes can be lush gardens full of beautiful plants (Welsh 2007) (Fig. 2).

• **Adapting to dry climates and creating green landscapes**

The principles presented in Xeriscape provide methods for planting in dry areas that have been present in Iranian gardening, culture, and lifestyle for a long time, illuminate the richness of the Iranian garden in technical areas, and reduce energy consumption in line with its greenery and refreshing. Therefore, these principles propose solutions in line with reducing water consumption and lush landscapes in dry areas (Kafi, 2014). Numerous examples of Iranian gardens in hot and dry areas that are designed based on the climate have sufficient greenery and freshness. Such evidence shows that adhering to the principles of Xeriscape is not consistent with the interpretation of ‘landscape dryness’.

Table 3. Impacts of Xeriscape on Urban Landscapes. Source: Authors.

Impacts of Xeriscape on Urban Landscapes	
The most important impact of Xeriscape is the significant reduction in water consumption in urban green spaces. This is especially important in cities with dry and water-scarce.	Reduction of water consumption
Xeriscape creates sustainable, environmentally friendly landscapes using native, hardy plants that require less fertilizer, pesticides, and maintenance.	Creation of sustainable landscapes
The use of native plants in Xeriscape helps to increase biodiversity in cities. These plants provide a suitable habitat for insects, birds, and other small animals. Reduced maintenance costs: Xeriscape significantly reduces the cost of maintaining urban green spaces by reducing the need for irrigation, fertilization, and spraying. By using diverse plants and creative designs, Xeriscape creates beautiful and eye-catching landscapes in cities. These landscapes help improve the quality of life of citizens.	Biodiversity increase



Fig. 1. Colorado Springs Xeriscape Garden. source: www.sunflowerid.com.



Fig. 2. Color diversity and vegetation in Xeriscape landscapes. source: www.thespruce.com.

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Table 4. Basic concepts of the seven principles of Xeriscape. Source: Authors

Description	Features	Principles
Providing shade with vegetation or canopy	Paying attention to shade in landscapes	
Zoning the landscape based on functional areas and water consumption	Zoning based on water consumption	Planning and Design
Determining a planting pattern compatible with low-water landscaping principles	Planting plan	
Examining the condition of the existing soil bed	Testing Soil	Soil Analysis
Selecting plants based on the water consumption zones of the landscape and the function of each area	Climate-adapted plants	
Pruning plants appropriately and timely to maintain and create deep roots of plants	Plant pruning	Selecting Appropriate Plants Creating Lawn Surfaces
Selecting plants based on the purpose of planting in the landscape	Plant selection based on physiological conditions	
Size and location of lawn areas according to the function required in each zone	Paying attention to the lawn area	
Selecting the type of irrigation system suitable for each zone and according to the water requirement of each plant.	Use of supplemental irrigation	Optimized Irrigation
Reducing surface evaporation of soil water in green spaces	Mulching	Using mulch
Examining the performance status of irrigation systems	Control of irrigation systems	
Applying qualitative weed control on the site	Weeding	Proper maintenance (proper gardening practices)
Periodically examining the chemical and physical properties of the soil bed.	Control of soil quality	

The Alignment of Rainfed Farming with Xeriscape

In the following section, seven principles of Xeriscape are presented and compared with the concept of rainfed to reveal their similarities and differences.

• Principle one: Planning

- The first principle in Xeriscape

Having a careful design is the first step that contributes to achieving long-term landscape design goals. A successful design, in addition to aesthetic principles, also pays attention to factors such as views, slopes, water storage, maintenance conditions, and environmental added value. In the landscape design process, factors such as the climatic conditions of the region, the microclimate of the site, the condition of the soil, the existing vegetation, and the topography of the region need to be examined (Hekmati, 2010, 256). In Xeriscape landscaping, planning is done based on zoning that is not the same in terms of value. The overall space of the site is divided into three zones in terms of water consumption (Wade & Midcap, 1992). The importance of each zone is also determined based on the level of user presence and utilization (Kafi, 2014).

The first principle in rainfed farming: Paying attention to climatic factors is one of the most important criteria for producing a quality product in rainfed farming. Rainfed

farming, like Xeriscape, requires planning. The weight value of the desired areas can be obtained by examining information such as climatic conditions, the time of the start of rainfall in the desired areas in the spring and autumn seasons, the appropriate time for budding, and flowering, and the stage of grain filling, and the vegetative needs of rainfed farming, using the synthesis of these layers and in doing this, a suitable area for cultivation and zoning can be achieved based on rainfed farming spaces, grass plants, etc (Abbasi et al., 2013).

• Principle two: The use of mulch

- The second principle in Xeriscape

As the name suggests, mulches are used to protect plants from extreme soil temperature changes and water loss, and prevent the growth of weeds (Hamzei & Borbor, 2014). Today, mulches are divided into four categories: chemical, organic, mineral, and man-made. The choice of the type and diameter of mulch depends entirely on climatic factors, soil type, wind intensity, and other environmental conditions. The use of mulch in Xeriscape is considered an important principle to prevent water loss through soil surface evaporation (Kafi, 2014)

- The second principle in rainfed farming

In rainfed agriculture, soil conservation is a set of techniques that preserve organic matter and soil fertility

(Haghparast, 2013, 14). One of the problems in rainfed agriculture is maintaining soil moisture. Mulching is used as a solution to preserve soil moisture (*ibid.*, 15) and create temperature adjustments so that the soil surface becomes cooler in summer and warmer in winter (Dashadi, 2022). Among the advantages of this method are enhancing the capacity to absorb and retain soil moisture, improving the amount of organic matter and fertility, reducing soil surface temperature, and reducing evaporation (*Ibid.*, 15)

• **Principle three: Supplementary irrigation – observing irrigation efficiency**

- **The third principle in Xeriscape**

This principle emphasizes reducing water loss from the source to the plant root zone. Today, its practical example can be seen in the use of pressurized irrigation systems, such as drip, sprinkler, and subsurface irrigation (Kafi, 2014). Supplementary irrigation is a temporary solution that is designed to increase the natural transpiration rate of the plant when water is available (Karimi & Joleini, 2019). In a green space based on Xeriscape, supplementary irrigation should be reduced to a minimum and only implemented in a limited manner based on the actual needs of the plants (Sarami, 2012).

- **The third principle in rainfed farming**

In rainfed farming, water or moisture deficiency is one of the main limiting factors in improving the yield of agricultural products. Supplementary irrigation allows for the optimal use of limited renewable water resources in rainfed areas. Implementing this method at critical stages of plant growth plays an effective role in reducing yield fluctuations and achieving sustainable production. Also, supplementary irrigation can reduce the risk of crop failure and increase the sustainability and efficiency of irrigation. This method involves providing a certain amount of water during periods when rainfall stops, to maintain optimal conditions for plant growth and stable yield (Karimi & Joleini, 2019).

Principle Four: Soil Enhancer

Principle Four in Xeriscape: In the landscape design process, scrutinizing the physical and chemical features of the soil is important. Soil analysis is carried out to provide a favorable environment for the growth and development of plant roots (Wade, 1992). At this stage, factors such as structure, texture, water holding capacity, and drainage rate of the soil are evaluated so that the designer can determine appropriate corrective measures. Soil improvers include substances that are added to amend the physical and chemical features of the soil. These substances can improve water holding capacity, permeability, drainage, aeration, and soil structure and

ultimately provide favorable conditions for root growth (FAO, n.d.).

Principle Four in rainfed farming: In agriculture, the use of soil improvers is important to increase crop capacity and enhance the ability of the soil to store water. This process mainly focuses on increasing the amount of soil colloids, which directly leads to an increase in organic carbon content (Kafi, 2014). To achieve this goal, organic materials such as compost and animal manure are added to the soil to increase its ability to retain moisture. The method of soil amendment and strengthening depends on factors such as the physical and chemical properties of the soil, the type of plant species selected, and the planting season (Brengele, 2009, 146).

Principle Five: Selecting Appropriate Plants for Planting

• **The fifth principle in Xeriscape**

One of the basic principles in this approach is the selection of appropriate plant species that are compatible with environmental conditions. However, the evaluation of low-water plants in landscape design is not based solely on an absolute comparison of their water consumption, but factors such as adaptation to climate, soil type, evaporation rate, and plant biological needs also play a decisive role in this selection (Kafi, 2014). Selecting the appropriate plant does not mean selecting plants that are compatible with the planting plan, but rather selecting plants that are compatible with the environmental conditions and physical conditions of the planting site. Ideally, plants need to adapt to fluctuations in temperature and soil moisture, because resistance to water scarcity is one of the principles of Xeriscape landscaping, but it is not the only important factor (Sarami, 2012).

The fifth principle in rainfed farming: Choosing the right crop is one of the important decisions in the success or failure of rainfed farming. Identifying the characteristics of adaptation and resistance to water scarcity in plants and selecting the most compatible ones in rainfed can be effective in increasing the level of yield (Kazemi, 2008, 275). The amount of water that a plant consumes during the growing season in an area to produce a crop can indicate the suitability of that plant for farming in that area (*ibid.*, 262). In rainfed farming, the use of plants resistant to annual drought stresses is considered in addition to its economic characteristics. Also, the selection of plants should use the elements in the soil with high efficiency so that less chemical fertilizer is used in rainfed lands and the cost of production is reduced by using less fertilizer. To select a suitable plant for Dim cultivation, the following should be considered:

• The characteristics of the region's climate and growth type

- Using plants compatible with the region (Karimi & Joleini, 2019).

- **Principle six: Turf surfaces**

- **Principle six in Xeriscape**

In landscape design, the turf acts as a backdrop to highlight the beauty of other plants. The term 'turf' refers to that part of the lawn that goes beyond aesthetic aspects and enters the field of 'landscape engineering'; meaning that in addition to visual appeal, it also has functions such as creating suitable spaces for recreation, sports activities, and rest (Kafi, 2014). Therefore, turf is considered one of the most versatile and functional plants in landscaping. For this reason, in Xeriscape, the turf is not only used for beauty and recreational purposes but is also considered one of the most effective cover plants for reducing runoff and soil erosion, which indicates the purposefulness of planting turf, as opposed to landscapes that use it with no purpose. (Naseri, 2016).

- **The sixth principle in rainfed agriculture**

In rainfed farming, large areas of an area that are not suitable for agriculture and do not provide irrigation facilities are used to cultivate grass plants to prevent soil erosion, maintain available moisture, and produce food for livestock (Kazemi, 2008, 407). It is also necessary to plant grass plants in lands where production is minimal (Bregle, 2009, 181).

- **The seventh principle: Optimal maintenance**

- **The seventh principle in Xeriscape**

Another goal of Xeriscape is to reduce maintenance operations as well as landscape maintenance costs (Sarami, 2012). Proper and optimal management of plants not only reduces water consumption but also helps maintain their health and sustainable growth. Increasing the amount of potassium in plant nutrition, through the use of organic, mineral, and biological fertilizers, can strengthen the resistance of plants to drought and adverse environmental conditions. (Kafi, 2014). In other words, proper irrigation gardening operations, timely pruning, weed removal, mowing, and pest and disease control are factors that keep a landscape always healthy, beautiful, and fresh (Welsh, 2006).

- **The seventh principle in rainfed farming**

Optimal maintenance to achieve a suitable crop is another principle of rainfed farming after the fallows are placed in the soil. To protect young plants from damage caused by weeds, they can be controlled by cutting or using herbicides (Bregle, 2009, 181). The management of rainfed farming should be such that it guarantees the sustainability of production at the lowest cost, especially in the face of Drought stresses that are likely to occur every two to five years. Implementing optimal post-cultivation maintenance methods, such as supplemental irrigation and pest and disease control, can increase crop

yield and reduce farmers' vulnerability in high-rainfall years (Haghparast, 2013, 122).

Discussion

This study examined in this research, definitions of the three terms 'Drought', 'Xeriscape', and 'Rainfed', and then compared them with each other.

First, the concept of Drought was examined from three perspectives: morphology, geographical, and ecological. Based on the discussion presented earlier, it can be seen that Drought in the morphology field has uniform and recurring patterns highlighting unity in texture, structure, and color. In contrast, Xeriscape, as mentioned earlier, Xeriscape landscapes include various colors and patterns and show no connection with the desert. Examining the phenomenon of Drought from a geographical perspective shows Drought is purely climatic and is associated with the amount of precipitation in each region and is considered a macro-scale concept. From an ecology perspective, dry landscapes have very weak and scattered vegetation cover, and even in some cases, Drought is synonymous with desertification or the absence of any vegetation cover. Such features are not aligned with the Xeriscape landscape in which appropriate vegetation cover is considered for each space based on need and function. Therefore, in Xeriscape, we have lush landscapes rather than dry landscapes. Scrutinizing the concept of rainfed farming shows that this approach is very close to Xeriscape, as in rainfed farming, planting any crop is based on climatic conditions and seed type, and rainfed farming does not mean absolute freedom and lack of care for the crops, because if necessary, supplementary irrigation is used. Mulch is also used to cover the soil to reduce water loss, and soil conditioners are used to increase agricultural capacity. All of these statements more or less indicate that Xeriscape is close to the concept of dryland.

Conclusion

According to definitions, Xeriscape is an approach to designing gardens with lush landscapes that require less supplemental irrigation than conventional landscapes and is not very compatible with the Persian interpretations of the term, which are considered equivalent to dryness. Therefore, the concepts and definitions of each are stated in the present study, and the findings show that matching xeriscape with the term dry landscape is not a suitable choice due to ambiguity and misunderstanding. In contrast, the concept of rainfed has a more consistent meaning and the principles of this agricultural method are very similar to xeriscape and follow almost a fixed idea. Therefore, xeriscape is much closer to the concept of a rain-fed landscape than a rainfed landscape (Table 5). Xeriscape is not only not a dry landscape, but a lush landscape to reduce water consumption by selecting

Table 5. A Comparative Study of Xeriscape and Rainfed (Deyim Kari). Source: Authors.

Rain-fed(Deyim Kari)	Xeriscape	Components of Agroscape and Rainfed Cropping
Observing climatic conditions to increase yields	Focus on zoning in the planting plan	Planning
Increasing soil moisture retention capacity	Preventing water evaporation from the soil surface	Use of mulch
Providing water for seasons with reduced rainfall	Using a supplemental irrigation system during periods when plants are stressed	Supplemental irrigation
Using soil amendment agents to increase crop and improve soil water storage	Using amendments to improve the physical and chemical properties of the soil	Soil amendments
Selecting appropriate seeds based on environmental conditions	Choosing plants appropriate to environmental conditions	Selecting appropriate plants for planting
Planting grass (cover crops) in spaces that cannot be irrigated and for livestock fodder	Using grass (cover plants) for rest and recreation spaces	Sodding levels
The goal of this cultivation is to manage rainfed agriculture in a way that ensures production sustainability at the lowest cost.0	The goal of this type of landscaping is to reduce maintenance operations and landscape maintenance costs.	Optimized maintenance

appropriate vegetation and optimal maintenance compared to desert and dry landscapes. Therefore, it is suggested that the term “rainfed landscape” be popularized in specialized

and scientific literature so that there is correspondence and compatibility between the term and the audience’s perception and external objectivity.

Endnotes

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