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# Xeriscaping: Water-Conserving Landscape Technique

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## ABSTRACT

Xeriscaping is the process of landscaping or gardening that reduces or eliminates the need for supplemental water from irrigation. The concept of xeriscaping is appropriate in current scenario, where water is becoming precious day by day. The xeriscaping offers a way to have beautiful, livable landscapes without using excess water. Xeriscaping produces greenspaces that require low amounts of maintenance and irrigation, and promote biodiversity. Xeriscaping has the potential to reduce water usage and maintenance, improve biodiversity, serve as a habitat for wildlife, lower pollution, as well as mitigate heat within urban areas

## INTRODUCTION

Landscape is a vital component of the urban environment that can provide environmental, human health, psycho-social and economic benefits. Water scarcity is a critical issue that affects more than 40 per cent of the global population and it is due to the increase in world population, climate change related to global warming, pollution and unconscious consumption of water resources. In landscaping, incorrect plant choices and the use of grass may also increase pressure on limited water resources. In view of present situation of water scarcity and water-crisis, an alternative approach to traditional landscaping may be xeriscaping.

The concept of xeriscaping was originally developed in Denver, Colorado. The word 'xeriscape' is composed of Greek words 'Xeros' which means dry and 'scape'

means vista or view. Nancy Leavitt, an environmental planner coined the term xeriscape in 1981 by combining landscape with the Greek prefix xero-, meaning 'dry'. Xeriscaping is one of the landscaping techniques that is based on the idea of conserving water and is especially made for regions/sites that are prone to drought or where water conservation is practiced. Xeriscaping is the process of landscaping or gardening that reduces or eliminates the need for supplemental water from irrigation. It is promoted in regions that do not have accessible, plentiful or reliable supplies of fresh water and is gaining acceptance in other regions as access to irrigation water is becoming limited. Xeriscaped landscapes can reduce water use up to 60% or more compared to regular lawn landscapes. Green spaces are very important, but due to climate change and other problems like decreased water resources the green spaces are being reduced in number so xeriscaping is an alternative approach to increase the number of green spaces mainly in water scarcity areas. The goal of xeriscaping is to create a beautiful landscape in water- scare areas. The xeriscaping offers a way to have beautiful, livable landscapes with minimum possible use of water. These xeriscape designs are originally developed for drought-prone areas, but principles of xeriscape can be applied in making designs for residential or commercial sites. In cities, many people appreciate beautiful landscapes, but do not have time to devote in a garden, so the use of plants which are well adapted to local climate, use of mulch to suppress weeds and drip irrigation are measures to conserve water. The beneficial effects of xeriscaping are water conservation, less maintenance cost, increase in property value, less environmental pollution and serve as a habitat for wildlife.

**Plant selection**

Plants suited to xeriscaping are sometimes referred to as "xeric" plants. These are plants with low water requirements and therefore withstand drought well. Xeriscaping has become widely popular in some areas because of its environmental and financial benefits. The most important environmental aspect of xeriscaping is choosing vegetation that is appropriate for the climate. Vegetation that thrives with little added irrigation is called drought-tolerant vegetation. Xeriscaping often means replacing grassy lawns with soil, rocks, mulch, and drought-tolerant native plant species. So, the plants which possess the features for water conservation should be used. The tree species such as *Albizia lebbek, A. procera, A. arabica, Acacia auriculiformis, Butea monosperma, Bombax ceiba*, *Casuarina equisetifolia, Cassia fistula, Erythrina variegata and Prosopis julifera* can be planted. The shrubs which require less water such as *Bougainvillea glabra, Carrisa carandus, Duranta repens, Gardenia jasminoides, Lawsonia inermis, Lantana sellowiana, Jasminum sambac, Malpighia coccigera, Plumbago auriculata, Russelia juncea* and *Tecoma undulata* can also be used in xeriscape design. The flowering annuals such as *Alyssum maritimum*, *Amaranthus* sp., *Brachycome iberidifolia*, *Phlox drummondii*, *Portulaca* sp., *Verbena hybrida* and *Zinnia elegans* can be planted.

Cacti have evolved many physical adaptations that conserve water. For example, their prickly spines, the cactus version of leaves, protect the plants from water-seeking animals. Their large, round stems have thickened to store large amounts of water. Their waxy skin reduces water lost to evaporation. Several hardy species of cacti such as *Cereus hexagonus, Cereus argentinensis, Cephalocereus senilis, Mammilleria goldi, Mammilleria candida, Opuntia* sp., *Rebutia* sp., *Trichocereus candicanis* and succulents like *Adenium* sp., *Agave americana, Aloe* sp., *Cissus* sp., *Crassula* sp., *Euphorbia aphylla, Kalanchoe, Pedilanthus* sp., *Sedum compactum, Sedum morganianum* and *Sanseveria trifasciata* can be planted.

**Water conserving principles**

Xeriscape incorporates seven water-conserving principles:

- Planning and design
- Efficient irrigation systems, properly designed and maintained
- Use of mulch
- Soil preparation
- Appropriate turf
- Water-efficient plant material
- Appropriate maintenance

The first step in this process is planning the design. A good design will provide direction and guidance to ensure water-saving techniques. Before landscape planning, an architect should consider the location and orientation of home (north, south, east, or west), other site structures, slopes, soils, drainage, prevailing winds, sun exposure, high and low activity areas, desirable views, privacy/screening needs, potential locations of future structures, and other site improvements. The design should be planned in advance so that it can be executed in stages as per the availability of resources. The design is prepared on the basis of need of the family and time which a family can devote in the garden. There should be proper allocation of area for the children's playing, sheds, annuals etc. The lawn is one of the features which need a considerable amount of water. So, in xeriscape design, lawn area should be reduced to a minimum functional use. The lawn should be aerated at suitable intervals to allow proper water infiltration into roots.

The grass species which require less water should be used in making lawn. The mulch material provides a cover over soil thereby reduces evaporation, regulates soil-temperature, control erosion and minimizes competition for water and nutrients by controlling weed growth. The polythene mulch can be used to capture rain water for future use. The common mulch materials are hay, straw, manure, stone, wood chips and pine needles. The annuals should have mulch thickness of 3-5 cm and trees and shrubs should have 5-8 cm mulch thickness.

The use of traditional irrigational methods results in considerable amount of water loss as infiltration, run-off and evaporation. The use of sprinkler method is better for irrigating lawns and drip method is suitable for irrigating tree and shrubs. These irrigation methods deliver water at a slow rate which encourages efficient root absorption, minimum weed population, reduced pooling and erosion. The watering should be done deeply and less frequently. The shady areas need less water. The irrigation frequency and quantity should be decided according to soil type and climatic conditions. The soil is the basic factor affecting growth of plants and other management practices. The soil should be fertile, well drained and have good water holding capacity. The compact soils affect plant growth by poor aeration. The sandy soils have poor water holding capacity and poor fertility. The use of green manures, lime and gypsum can be done to improve soils for better plant growth. The native plants which are drought tolerant and need less water should be planted. The native plants are well adapted to local soil and climatic conditions and need less care than exotic plant species. In hot, dry areas of south and west direction, plants which can tolerate water stress should be planted. The plants which prefer more moisture should be planted in North and East-facing slopes and walls. The maintenance involves operations like irrigation, weeding, pruning, fertilization, disease and insect-pest control at regular intervals for proper growth of plants.

**CONCLUSION**

The creation of new native plant crops for xeriscape gardens and landscapes is still in its infancy, and there are many prospects for the interested or motivated researcher. Xeriscaping offers a way to have beautiful, livable landscapes without excess water use. It allows areas close to us to be cooler and hospitable, while investing less water on parts of the landscape in which we spend less time.