Xeriscaping: A Greener Solution to Changing Climate & Urban Water Waste

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Abstract

Currently, the entire planet is encountering shortage of water, coupled with skyrocketing water and maintenance expenses. Saving water has become substantial. With changing climates and growing significance of sustainability, particularly in a country as diverse and populous as India. Xeriscaping is a landscaping philosophy that reduces or eliminates the need for supplemental water from irrigation. It is not merely a trend but a pragmatic approach to creating aesthetically pleasing landscapes that are harmonious with the local environment and climate conditions, especially in arid regions. A key feature of xeriscaping is the selection of native or climate-appropriate plants that can thrive with minimal irrigation. Efficient irrigation is another cornerstone of xeriscaping. Instead of traditional sprinklers, drip irrigation systems or soaker hoses deliver water directly to the plant roots, minimizing evaporation and runoff. It is a smart, sustainable approach to landscaping that meets both environmental and aesthetic goals. Whether for residential gardens or public spaces, it provides a practical solution to the challenges of water scarcity and climate change, making it an increasingly popular choice for eco-conscious homeowners and city planners alike.

Introduction: Xeriscaping is landscaping and gardening reduces or eliminates the need for supplemental water from irrigation. It is promoted in regions that do not have easily accessible, plentiful, or reliable supplies of fresh water, and is gaining acceptance in other areas as access to water becomes more limited. Xeriscaping may be an alternative to various types of traditional gardening. The word is derived from the Greek word xeros, meaning dry. The concept of xeriscaping originated in Denver, Colorado, in the early 1980s. Because of severe drought conditions, Denver had rationed water and prohibited irrigation of lawns and yards. It refers to landscaping which doesn't require additional water. In some areas, terms such as *water-conserving landscapes*, *drought-tolerant landscaping*, and *smart scaping* are used instead. Plants whose natural requirements are appropriate to the local climate are emphasized, and care is taken to avoid losing water to evaporation and run-off. The specific plants used in xeriscaping depend upon the climate. Xeriscaping is different from natural landscaping, because the emphasis in xeriscaping is on selection of plants for water conservation, not necessarily selecting native plants. It uses plants which are suited to the local climate, and practitioners ensure that water doesn't evaporate or run off. The plants used are known as xerophytes which are also called as dry loving plants, having plant adaptation to regions with scant or no water and hot conditions. Their natural habitats are the arid and semi-arid regions and those places with long summer drought. Public perception of xeriscaping has generally been negativing as many assume that that these types of landscapes are ugly or limiting. However, studies have shown that education in water conservation practices in the garden can greatly improve the public's perception of xeriscaping. The primary goal of xeriscaping is to create and sustain a healthy landscape by selecting plants that are well-suited to the site's natural conditions, thereby reducing the need for extra inputs like water, fertilizers, pesticides, and intensive maintenance.

Principles of landscaping

Xeriscaping is based on a set of seven core principles designed to promote water-efficient and sustainable landscaping:

1. **Planning and Design:** Careful planning is the foundation of xeriscaping. This involves assessing the site's natural features—such as sunlight, soil type, and drainage—and creating a landscape design that makes the best use of these conditions.
2. **Soil Improvement:** Enhancing soil quality, especially by improving its water retention and drainage capabilities, supports healthy plant growth. Most xeric adapted plants do best in sandy, well drained soils, but there are some that thrive on clay soils (i.e. buffalo grass). Compost or organic matter may be added depending on the needs of the selected plants.

3. **Efficient Irrigation:** Xeriscaping emphasizes watering practices that reduce waste. Drip irrigation systems and soaker hoses are preferred over traditional sprinklers, as they deliver water directly to plant roots.
4. **Appropriate Plant Selection:** Choosing drought-tolerant, native, or climate-adapted plants ensures that the landscape thrives with minimal water and care. Grouping plants with similar water and sunlight needs also enhances efficiency. Turf typically requires the most water and shrub/perennial beds will require approximately half the amount of water. Dry, sunny areas support low-water-use plants that grow well in the specific climate.
5. **Mulching:** Applying mulch around plants helps retain soil moisture, suppress weeds, and regulate soil temperature. Organic mulches like bark or compost are commonly used.
6. **Limiting Turf Areas:** Traditional lawns require significant water and upkeep. Xeriscaping reduces or replaces turf with groundcovers, native grasses, or hardscapes to cut water consumption.
7. **Maintenance:** While xeriscape landscapes are low-maintenance, they still require some care. Regular weeding, pruning, and checking irrigation systems ensure long-term health and appearance.

List of Plants suitable for xeriscaping

S.No	Evergreen trees		Deciduous Trees	
1.	*Acacia spp.*	Acacia	*Brachychiton populenus*	Bottle Tree
2.	*Agonis flexuosa*	Peppermint	*Cercidium spp.*	Palo Verde
3.	*Callistemon viminalis*	Weeping Bottlebrush	*Cercis occidentalis*	Western Redbud
4.	*Calocedrus decurrens*	Incense Cedar	*Chilopsis linearis cvs*	Desert Willow
5.	*Cupressus spp.*	Cypress	*Lagerstroemia indica*	Crepe Myrtle
6.	*Eucalyptus spp*	Eucalyptus	*Prosopis chilensis*	Chilean Mesquite
7.	*Juniperus spp.*	Juniper	*Puncia granatum cvs*	Pomegranate
8.	*Olea europea (fruitless)*	Olive	*Quercus spp.*	Oak
9.	*Pinus spp.*	Pine	*Robinia ambigua* 'Idahoensis'	Idaho Locust
10.	*Schinus molle*	California Pepper	*Vitex agnus-castus*	Chaste Tree

S.No	Western Native Shrubs		Flowering Shrubs	
1.	*Arctostaphylos spp.*	Bearberry	*1. Alygonehuegelii*	Blue Hibiscus
2.	*Artemisia arborescens*	Shrubby Wormwood	*2. Cistus spp.*	RockRose
3.	*Ceanothus spp.*	California Lilac	*3. Grevillea spp.*	Grevillea
4.	*Encelia californica*	Brittlebush	*4. Hibiscus syriacus*	Rose of Sharon
5.	*Fremontadendron californicum*	Flannelbush	*5. Lavandula spp.*	Lavender
6.	*Heteromelesarbutifolia*	Christmasberry	*6. Plumbago auriculata*	Cape Plumbago
7.	*Lavatera assurgentiflora*	Calif. Tree Mallow	*7. Raphiolepis indica*	Indian Hawthorne
8.	*Leucophyllum frutescens*	Purple Sage	*8. Ribes sanguineum*	Red Flowering Currant
9.	*Mahonia aquifolium*	Oregon Grape	*9. Tecomaria capensis*	Cape Honeysuckle
10.	*Tecoma stans*	Yellow Bells	*10. Xylosmacongestum*	Shinyu Xylosma

Xeriscaping in India: India's diverse climate and increasing water shortage challenges make xeriscaping a compelling choice. This method can contribute to addressing water-related concerns in urban regions, where landscaping often requires considerable water usage. In rural areas, especially those vulnerable to drought, xeriscaping can aid in preserving soil health and reducing erosion.

MCD to develop city's first Xeriscape garden--dry landscape park in E Delhi

Few examples of Xeriscaping

Selection criteria for these plants

- They need fewer watering than typical lawn grasses.
- They can tolerate, resist, or avoid drought after they are established.
- They have attractive ornamental features.
- They are relatively easy to grow.
- They have not been invasive under provided growing conditions.

Watering requirements

The water requirements of these plants vary by species and by the size of the plant. Most of these plants will require some supplemental irrigation. The amount of water that will be needed to be applied, also depend on climate, soil type, and sun exposure. It is affected by cultural practices, including how watering is done, whether or not mulch is used, and where windbreaks such as fences, walls, and other vegetation, are located. All plants require regular watering until their roots are established. For perennials, this means that they will need water on a regular basis at least during their first growing season. Trees and shrubs may require regular irrigation for up to three years after transplanting.

Advantages of Xeriscaping

- **Significant Water Savings**: Xeriscape landscapes can use up to 66% less water compared to traditional lawns.
- **Supports Water Availability**: Conserving water through xeriscaping allows more to be available for household, community, and environmental needs.
- **Low Maintenance requirements**: With minimal weeding and mulching, xeriscaping demands considerably less time and effort to maintain.
- **Efficient Use of Rainfall**: Proper plant selection, soil grading, and mulching in xeriscaping help maximize the retention and use of natural rainfall.
- **Lower Maintenance Costs**: Reduced reliance on fertilizers and lawn equipment leads to decreased upkeep expenses.
- **Minimized Waste and Pollution**: Xeriscaping helps reduce organic waste from lawn clippings and limits the use of chemical fertilizers, thereby lessening urban runoff and environmental pollution.

Disadvantages of Xeriscaping

- **It may not meet modern aesthetics:** Some homeowners associations have strict rules requiring a certain percentage of land be used as lawns.
- **Reduced areas for sports:** Reducing lawn areas can limit a garden's use as a recreational area.
- Certain plants such as cacti and agave contain thorns or serrated edges which may harm pets and children.
- **Initial Cost:** As with any landscaping project, the initial cost of installation may be a deterrent for some.

Conclusion: Xeriscaping is a landscaping approach designed to conserve water while reducing costs and resource usage. When thoughtfully planned and executed, it can create an attractive and sustainable outdoor space. By incorporating native and drought-tolerant plants, the need for irrigation is significantly reduced. Mulching and the use of permeable materials help retain soil moisture, while adding features like rocks, gravel, or stepping stones introduces texture and visual interest to the landscape. This method is particularly well-suited for areas prone to drought or with limited access to fresh water. As water scarcity becomes a growing concern, xeriscaping is gaining popularity in regions where water supplies are not abundant or consistently reliable. It serves as a practical and appealing alternative to conventional gardening practices.

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