Water-Conserving Gardens:
A User's Manual

By

The Center for the Study of the Built Environment (CSBE)

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Table of contents

Introduction

People often assume that a low-water using landscape has to be barren and dry, and that it is characterized by a predominance of rocks and cacti. This could not be further from the truth. Through a series of practices related to water conserving landscapes you can create attractive and sustainable gardens that are lush and colorful, and that also save water and money. Such practices include using drought tolerant plants, incorporating hardscaped surfaces, taking advantage of rainwater harvesting, as well as following specific maintenance techniques when caring for your plants.

This manual introduces the various possibilities of water-conserving gardening, and will prove useful whether your garden is small or large, and whether you are creating a new garden or upgrading an existing one. The manual is divided into seven chapters, each illustrating one of the principles associated with water-conserving landscapes. In each chapter, you will find clear ideas and easy to follow guidelines that will help you create a beautiful, water-conserving garden. This manual also includes references to both printed and web-based resources for those who would like to get more in-depth knowledge about the subjects covered in its various chapters.

Chapter 1: Planning and designing your water-conserving garden

Topics to be covered in this chapter

I. Designing a water-conserving landscape
II. Identifying the main water-use zones in a garden
III. Creating microclimates
IV. Renovating an existing landscape
V. General considerations

Introduction

Developing a landscape plan is the first and most important step in creating a water-conserving landscape. Start with an accurate plan of the site, identify site problems and potentials, and develop a list of needs and wants to be incorporated in the plan. As your plan begins to take form, divide the landscape into water-use zones, and, whenever possible, incorporate shade.

Definitions

Hardscaping: the inorganic components of the landscape design (paved areas).
Microclimates: climates of localized spaces that differ from the overall climate of the area, such as under a tree, at the top of a hill or in between buildings.
Water-use zone: the zoning or grouping of plant materials according to their water needs.

I. Designing a water-conserving landscape

1. Start out with a plan of your property showing the location of the structure(s) and the existing features of your site.

2. Identify the characteristics of your site, such as desirable views, drainage patterns, natural elements, and orientation of the structure(s).

Site elements and characteristics to be identified

- Buildings and hardscaping elements (doors, driveways, terraces, and sidewalks)
- Property boundaries (streets, sidewalks, common areas, and adjacent lots)
- Infrastructure services (utility and sewage lines)
- Direction of water flow (waterways, downspouts, flow across property, and paved surfaces)
- Weather and microclimates (prevailing winds, slope orientation, sunny and shady areas, as well as wet and dry spots)
- Existing features (topography, natural features, existing plants, and adjacent structures)

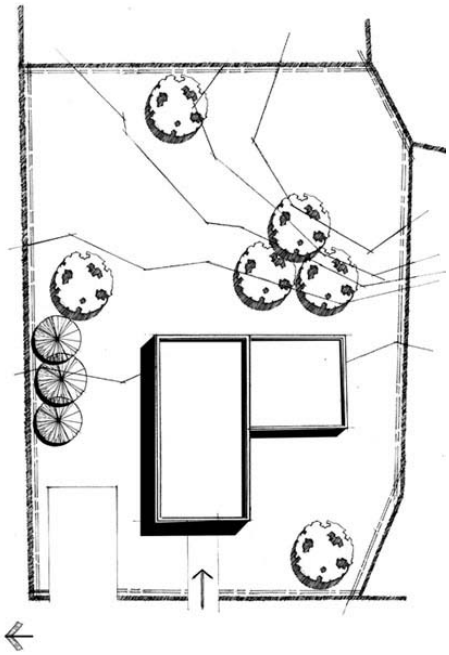

Fig. 1.1: A site plan showing the location of structures and existing features.

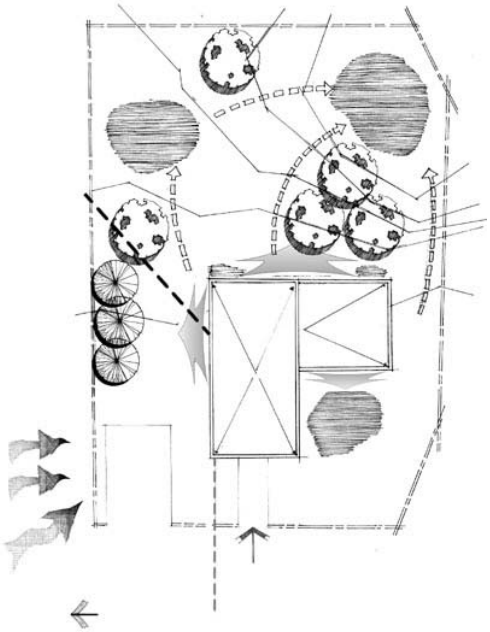

Fig. 1.2: A site plan showing site characteristics (views, drainage, … etc).

3. Consider the indoor/outdoor relationship between the different rooms in your structure and your garden.

Ask the following questions

- How do I want the site to look like from the indoors?
- How will the garden appear in the different seasons?
- What are the sun and shade patterns for each season?
- Which rooms have access to the garden?

4. Define the functions that your garden will accommodate. Indicate the *public*, *private*, and *service* areas of your landscape.

- Public areas, such as the entry area to the structure, are the most highly visible areas in the garden.
- Private areas are where most of the outdoor activities take place. The landscape in this area needs to be functional, attractive, and durable.
- Service areas require the least care and water of the three areas, as they usually are screened from view. They include work or utility areas that may consist of garden sheds and equipment.

5. Establish water-use zones in your garden by positioning plants that use similar amounts of water together. (See following section)

6. Develop a master plan of your garden, taking into consideration issues such as function, color, and the desired overall effect.

7. Fit plants to the design, once you have achieved the overall effect you desire. For principles of plant selection refer to chapter 4.

II. Identifying the main water-use zones in a garden

1. **High water-use zones** are small, highly visible and highly maintained areas in your landscape such as the public area and area around the patio. Plants in these zones should create the lushest part of your landscape, and therefore require regular watering in the absence of rainfall. When designing your garden, place this high water-use 'oasis' close to the structure or to a terrace, where it would be most regularly and easily used.

2. **Moderate water-use zones** blend lush areas with the drier parts of your landscape that require only occasional watering once plants are established. For this zone, use plants that can take advantage of rain and possible runoff water from the structure, but that also do not require constant watering. These can include low water-use ground covers and shrubs.

3. **Low water-use zones** are areas that are farthest away from the most active areas of your garden and that do not need irrigation once plants are established, since its plants are watered by natural rainfall. For this zone, use drought-tolerant native vegetation or imported plants from other regions with similar climates.

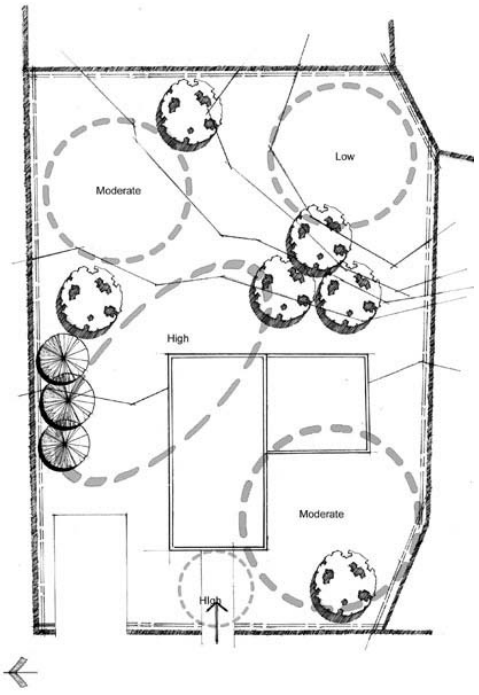

Fig. 1.3: A site plan showing water-use zones.

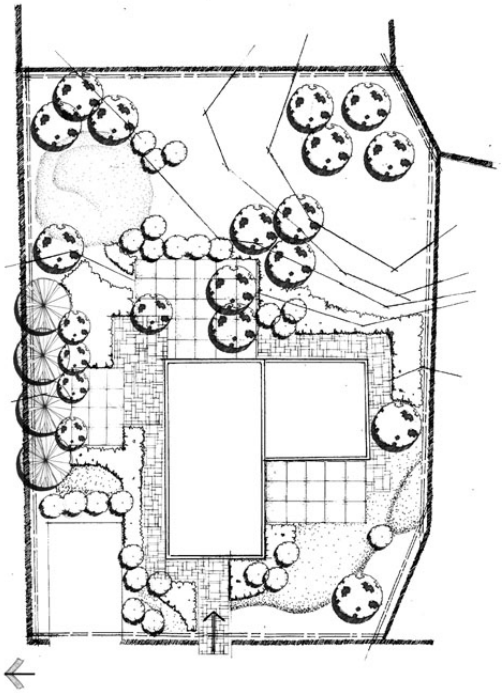

Fig. 1.4: A master plan of the garden design.

III. Creating microclimates

Microclimates result from differences in sun exposure, shade patterns, wind patterns, topography, soil, plants, and the location of adjacent structures.

- Even the smallest microclimates, such as those resulting from the existence or placement of a large rock or a hedge, should be taken into consideration for appropriate plant placement.
- Shade from trees or structures in the landscape keeps the landscape cooler and reduces water loss, while creating a comfortable, pleasant living environment.
- The basic microclimates on your site should take the four main exposures (south, north, east, and west) into consideration.

Southern exposure:

- Is exposed to more sunlight on a regular basis than other exposures.
- Provides a longer growing season in the fall and an earlier warm-up date in the spring.
- Can be shaded easily in the summer by an overhang planted with vines or by a large deciduous canopy tree.
- Is suitable for species that naturally grow in full sun.
- Provides an ideal orientation for an outdoor winter area.

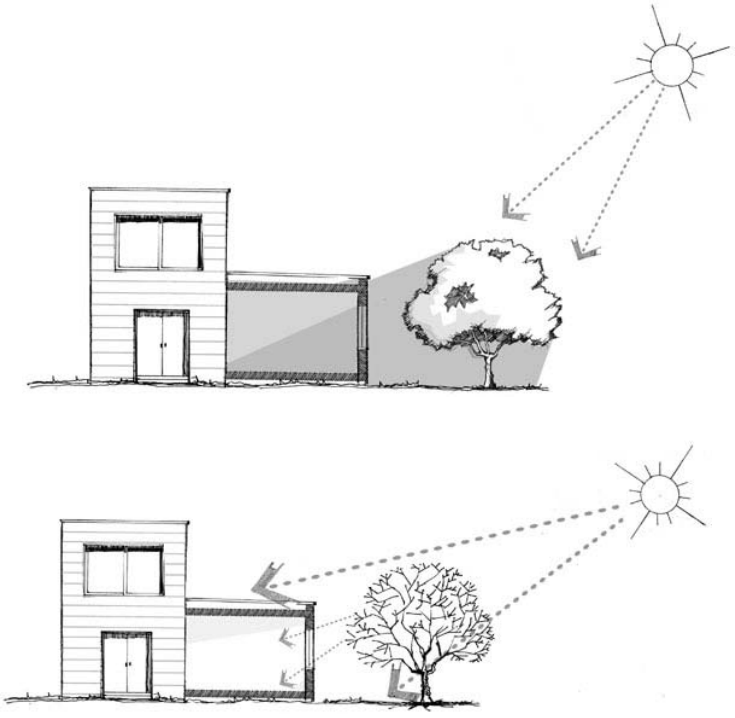

Fig. 1.5: Large deciduous trees shade the southern exposure during the summer, but allow for the winter sun to enter.

Northern exposure:

- May experience shade year-round.
- Is the last to warm up in the spring and the first to cool down in the fall.

- Has less extreme temperature swings than other exposures.
- Is suitable for plants that prefer cool, moist, shaded areas.
- Can provide a cool outdoor living area in the summer.

Eastern exposure:

- Is relatively well protected from the winter winds, and provides temperatures that are more moderate in comparison to southern and western orientations.
- Receives morning sunshine throughout the year.
- Provides relief from the afternoon sun.
- Needs large ornamental shrubs or small trees with low branches to filter the morning summer sun from indoor or outdoor living areas.
- Is suitable for plants that are native to sunny areas, and some plants that prefer part shade exposures.

Western exposure:

- Is characterized by significant temperature swings and rapid drying.
- Provides morning shade but receives afternoon sun.
- Can result in intensely hot areas in the summer.
- Is comfortable in the mornings during the summer, but because of the intense afternoon summer sun, needs to be shaded with tall deciduous trees planted at a reasonable distance from the structure.
- Is suitable for plants that prefer dry soil and warm temperatures.

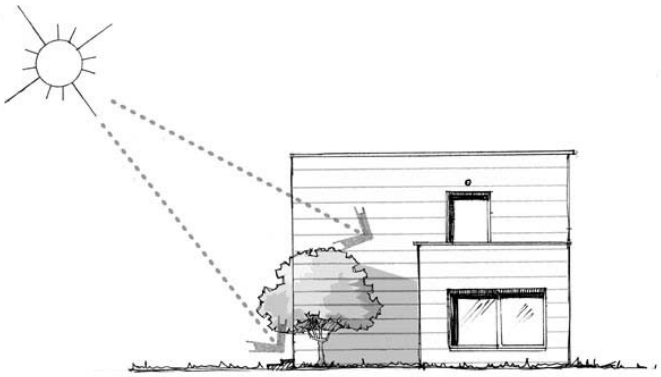

Fig. 1.6: Large trees protect the western exposure from the hot afternoon summer sun.

IV. Renovating an existing landscape

- Identify which plants to keep and which to remove from your existing landscape. (See list of recommended plants)
- Develop a list of plants you want to add to your garden.
- Identify changes you will need to make to your existing irrigation system. This may include installing a drip system, or providing the existing one with additional valves.
- Take advantage of the topographic characteristics of your site to direct rainwater to your plants.
- Considerable savings can be obtained by converting irrigated areas –especially lawn areas- into hardscaped ones.

- When planning your hardscaping, make sure to provide an adequate slope to allow for proper drainage.

V. General considerations

- Modifying an existing landscape to conserve water may be as simple as relocating a few shrubs and flower trees to more suitable locations.
- Altering plant maintenance practices and watering habits, even without making physical changes to the landscape, can save large amounts of water.
- Control erosion and runoff on slopes with low-water use vegetation, and consider introducing terraces or minor changes in the topography.
- Keep high-water-consuming areas to a minimum.
- Group plants with similar sun-exposure and water needs together, matching plants with the appropriate microclimate.
- Situate plants where they can benefit from the runoff water from adjacent areas.
- Eliminate plants that need irrigation from areas that are neither seen nor used.
- Where appropriate, modify conditions to reduce water loss by providing afternoon shade and windbreaks. These protect your plants from intense sun and drying winds.
- Plant wisely to avoid competition for water between trees and surrounding vegetation.
- Use mulch to reduce evaporation and to protect soil from erosion.
- Minimize changes to the original landscape to maintain its natural character.
- Tight curves or unnecessary bends in the design of planting beds and hardscaping are more expensive to implement and can result in maintenance problems. Straight lines or smooth flowing curves are the most suitable.
- Be realistic about the maintenance you are willing to provide or to perform in the future and plan accordingly.