

# Use It or Lose It

by *Tim Murphy*

At a recent public meeting on Stormwater Management in Tucson the citizens were asked for their input regarding the community's needs, and, significantly, to consider how much we would be willing to spend for the creation of a storm water control system. More appropriately phrased, the question might have been: As a desert community, how can we afford to allow a precious resource, like rain water, to escape?

In the past, engineers for our city have relied on formulas and strategies developed in Europe where storm water is a problem due to a glut of precipitation. Strategies there have been to provide ever more efficient (quicker) runoff channels. Here, as in other desert communities, we must view precipitation as a resource. The consequences of a less farsighted perspective insure that our city will be a temporary feature on an increasingly desertified landscape. Perhaps we need models of appropriate

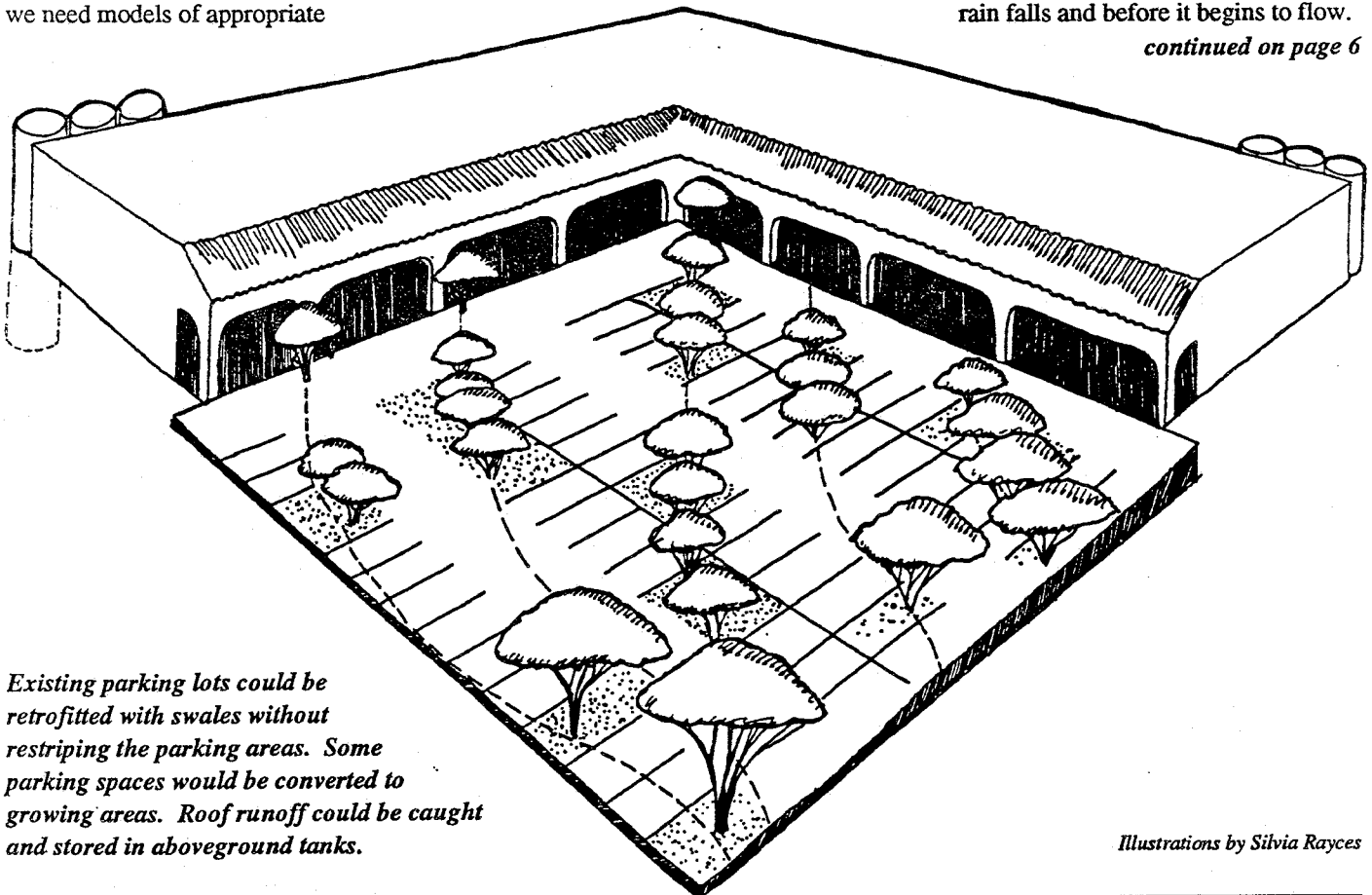
and sustainable practice from more climatically similar regions, like arid Asia, Australia, and the Middle East.

Until now our water has been provided by drawing on a finite aquifer through the use of finite, and fairly cheap, outside energy reserves. Our future as a desert community actually depends on our ability to make do with the renewable water resources that we are gifted with, and have, until now, largely wasted.

Tucson and its paved areas, schools, parks, shopping centers, and neighborhoods form a watershed, a collection of surfaces, rivulets, and tributaries joining to contribute their runoff to a larger whole. Often when we envision a watershed, we picture only the watercourses, and forget about the fabric of the landscape between. The least expensive, and most effective place to deal with runoff is in these upper reaches of our watershed: where the rain falls and before it begins to flow.

*After watching once again as unseasonably heavy rains create record flooding problems in Arizona's urban areas, it seems timely to print these articles. Tim Murphy's article was first published in PDJ No. 5 in 1989. We are delighted to see that Tucson-area permaculture activists Dan Dorsey and Janet Miller worked to create a swaled parking lot in the middle of Tucson, giving us all an example of what could be done in every urban parking lot in dryland areas.*

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*Existing parking lots could be retrofitted with swales without restriping the parking areas. Some parking spaces would be converted to growing areas. Roof runoff could be caught and stored in aboveground tanks.*

*Illustrations by Silvia Rayces*

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Metal and tile roofs enable us to safely collect rain, the cleanest water available, and store it in relatively inexpensive, above ground metal or ferroconcrete tanks. (Compare the cost of 10,000 gallons of bottled, purified, drinking water to the cost of a tank of the same capacity.) Such practices are mandatory in desert communities of Australia, where each house must have the capacity to safely store at least 10,000 Imperial Gallons of roof runoff. Elsewhere they are the only way to survive.

As inexpensive as above-ground water storage is, it is possible to store 50 times as much water in soils for the same cost. Water stored in this manner can then be used to sustain a wide variety of drought tolerant, perennial trees and shrubs. This vegetation can help moderate the extremes of our climate, lessen our need for outside energy, and help feed us as well.

An excellent example of a community in this country that completely captures and utilizes 100% of its precipitation in this manner is the Village

Homes Solar Development in Davis, California, with an annual rainfall of 18 inches. Village Homes accomplished this through design, and at modest expense, when contrasted with the cost of storm sewers and drainage channelization projects. This approach is a sane and practical alternative for new development.

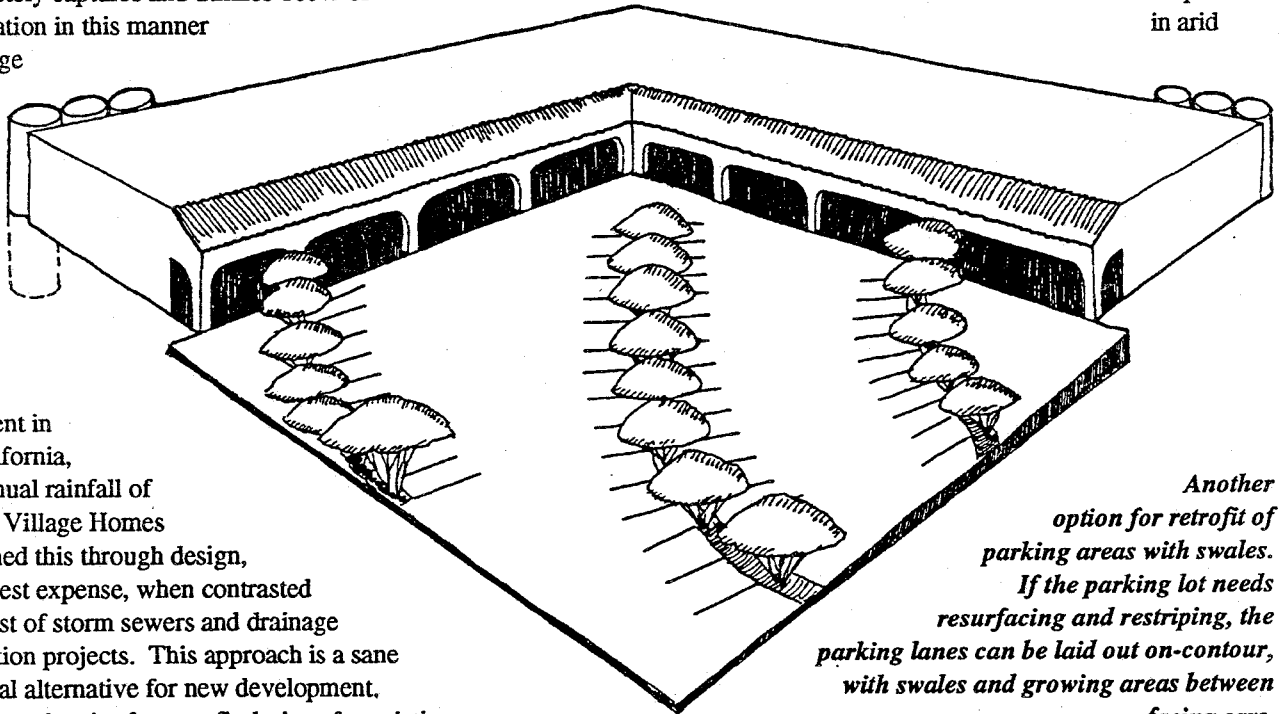
Costs to the city for retrofit designs for existing development can be deferred in part by: a) publicizing the economic and health benefits of tanks b) sponsoring neighborhood workshops that demonstrate simple, practical, and cost-effective techniques and strategies to harvest rain water for the garden and landscape and c) offering incentives to home owners and businesses who allow zero runoff from their holdings. Such incentives could take the form of stormwater

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tax deferments. Measures like these would dramatically reduce the volume of water on our streets and the job of city engineers would be simplified.

Institutions and businesses, especially, are major contributors to our stormwater dilemma. Large paved areas prevent infusion and also create huge heat sinks that stress our vegetation, desiccate our soils, and increase energy use. Water harvesting systems that traverse the contours of parking lots and direct runoff to frequent infusion sites planted with deep rooted and heat tolerant trees could enable us to shade better than 60% of these surfaces, dramatically reducing these problems while providing a richer habitat for humans and wildlife alike. Runoff from large roof areas could be stored in above ground tanks to allow irrigation of these trees in periods of drought. Streets and alleys could also serve as water harvesting systems for their landscape and shade elements, affording similar benefits. As a desert community, Tucson must adopt a realistic and responsible policy for stormwater resources that reflects a long term perspective.

It is not a sustainable practice in arid



*Another option for retrofit of parking areas with swales. If the parking lot needs resurfacing and restriping, the parking lanes can be laid out on-contour, with swales and growing areas between facing cars.*

lands to support unbridled growth while depending on impure fossil water and highly salinated Colorado River water. Dealing with stormwater as a treasured resource instead of as a nuisance in our community can, in the short run, save us money, and enhance the quality of life.

The long term benefits include: a measure of security in an uncertain climatic future, significant cut-backs on pumped, treated water use, a gradual recharge of our groundwater reserves and the evolution of a richer, healthier, more diverse habitat as a legacy to our descendants.