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Talk of the Town

Column: Large-scale rainwater harvesting: Is it worthwhile?

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Personal rainwater harvesting uses a home's roof gutters and downspouts to channel rainwater to a collection tank. The collected water is typically used for landscaping and significant conservation is achieved.

On a much larger scale, rainwater can be collected for direct use or added to our aquifer to help us achieve safe yield or to offset proposed groundwater pumping in the Big Chino Valley and thereby protect the flow of the Verde River.

Large-scale rainwater harvesting (LSRH) captures precipitation before about 97 percent of it is lost through either evaporation or transpiration by vegetation, or it runs off into streams. The premise is that rainwater captured before it collects into a stream is neither groundwater nor surface water and would not impinge on water rights of other parties. Rainwater harvesting on a large scale is a proven practice worldwide. It will work here too, but the questions are at what cost, with what environmental effects, and which methods would work best.

One method of LSRH uses the undisturbed landscape of steep mountain slopes as a collector for precipitation with minimal environmental disturbance. A second method, used on flatter ground, requires that the landscape be denuded of vegetation, contoured, and compacted to maximize direct runoff to a collection point. The ground surface may also be coated to increase the collection efficiency. The system requires significant maintenance, and there are substantial environmental effects. A third method, useful in urban subdivisions, is to collect storm water from roofs, streets, and saturated subsoils; the environmental effects of water collection are small, but the pollutants in urban runoff could require treatment.

LSRH has the potential to recover significant amounts of "new" water. For example, streets and rooftops in a large subdivision might recover hundreds of acre-feet per year (an acre-foot is 325,851 gallons). Abandoned agricultural lands and mountain front recharge might collect thousands more. A variety of LSRH projects spread around the area might substantially reduce our overdraft, currently estimated at 11,000 acre-feet annually. Engineering studies are needed to better define the potential recovery.

Because LSRH is "new" water and expands our supply, it has been a major topic of discussion at the Upper Verde River Watershed Protection Coalition meetings. The coalition expressed interest in an LSRH pilot project, which had been developed by local engineers. The coalition applied for a \$627,000 grant project from the Bureau of Reclamation, which was ultimately rejected.

If we expect to determine whether rainwater harvesting can significantly help us with our water supply, we need to expend considerably more resources than we have to date. The Citizens Water Advocacy Group (CWAG) believes that the coalition should evaluate whether large-scale rainwater harvesting could significantly augment our water supply.

As initial steps, using its own funds, the coalition should seek legal clarification of water rights and permit questions, complete a literature review, and identify all the design parameters and impediments that require investigation. Subsequently, the coalition can determine the need for pilot studies and the opportunities for outside funding. New grant applications should be prepared with transparency and public comments.

Recently our local legislators sponsored a bill to make harvested rainwater a new class of water in Arizona. The purpose of the proposed legislation was to encourage developers to collect rainwater and recharge it to an aquifer and in turn receive water credits supporting the development of new subdivisions.

The Arizona Department of Water Resources, some legislators, and other stakeholders raised concerns about the proposed legislation and called for a committee to study the concept before further consideration of legislation. CWAG has not taken a position on using harvested rainwater for development credits and agrees with the call to study the legal and implementation concepts for obtaining credits.

In summary, CWAG believes that LSRH has the potential to reduce over-pumping of our aquifers, but there are far more questions than answers. With water conservation and other means, LSRH has the potential to help us achieve safe yield, to mitigate proposed groundwater pumping in the Big Chino Valley, and thereby to protect the flow of the Verde River. LSRH requires and deserves substantial public investment to study the legality, the hydrology, and the environmental and economic effects. Public officials and the larger community could then decide whether it is worth pursuing further technical investigations.

Please submit your comments and questions to info@cwagaz.org.

The Nature Conservancy hydrologist Jeanmarie Haney will discuss "Protecting Streamflows for Human and Ecosystem Maintenance: What Has Worked Where?" when she speaks to CWAG on May 14. Details are at www.cwagaz.org.

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