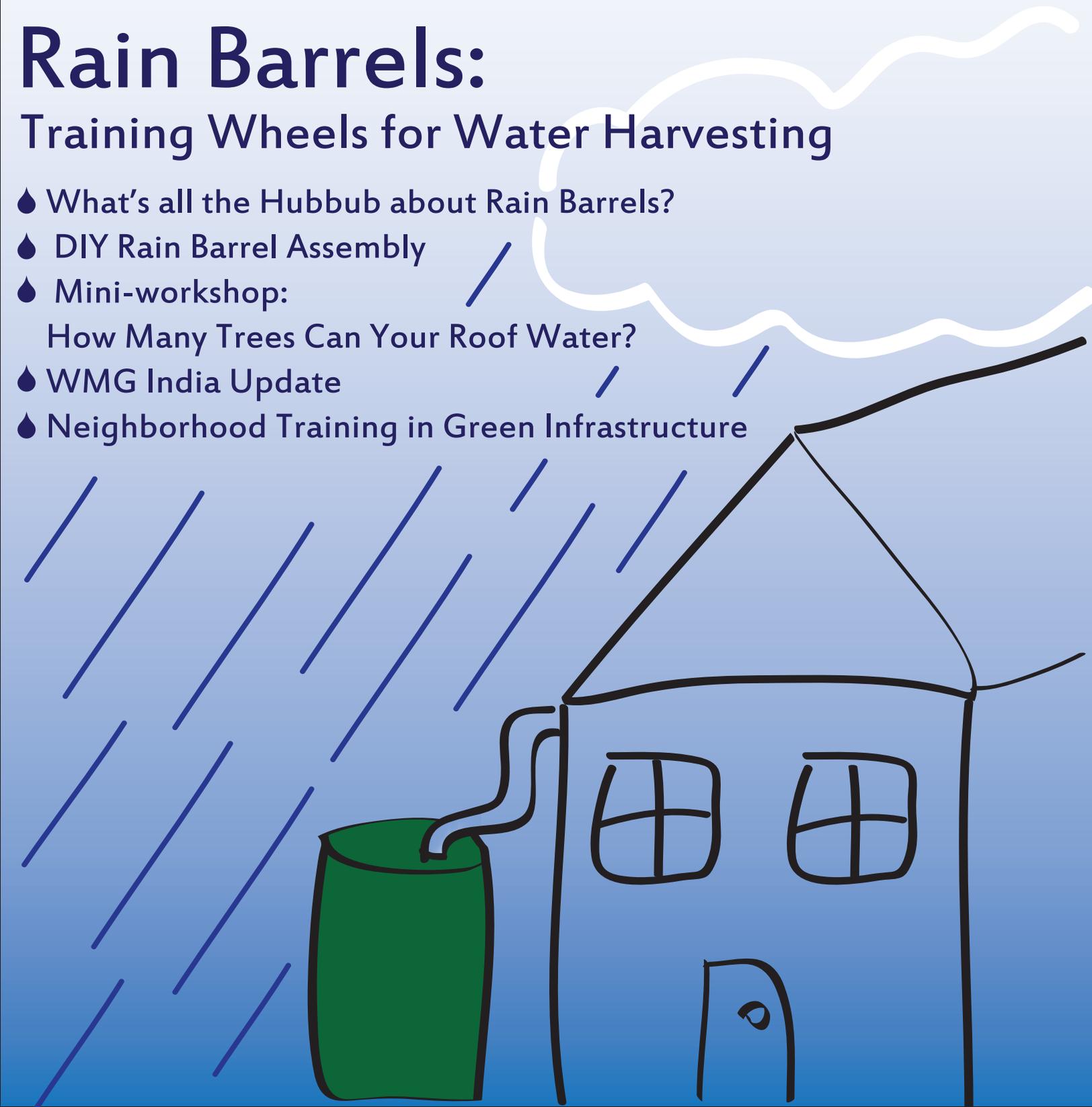


# A Watershed Moment

Winter 2011

## Rain Barrels: Training Wheels for Water Harvesting

- ◆ What's all the Hubbub about Rain Barrels?
- ◆ DIY Rain Barrel Assembly
- ◆ Mini-workshop:  
How Many Trees Can Your Roof Water?
- ◆ WMG India Update
- ◆ Neighborhood Training in Green Infrastructure



# What's All the Hubbub About Rain Barrels?



◀ **Lisa Shipek,**  
*Executive Director*

It seems the popularity of rain barrels is growing, particularly as a water harvesting practice that is promoted through city governments. The cities of Los Angeles, San Diego, New York, Chicago, and Austin, TX, have recently rolled out rain barrel distribution programs.

While WMG gets excited about any practice that harvests rainwater to put to beneficial use, we'd like to draw attention to both the pros and the cons of using rain barrels.

## Rain Barrel Pros

- Affordable (about \$50 - \$150)
- Easy starting practice to learn about rainwater collection
- Relatively easy to set up
- Portable

## Rain Barrel Cons

- Small storage capacity
- Fewer options for distribution of water than a larger tank
- Difficult to mosquito proof
- Not as sturdy as commercial or metal barrels

## Why not Bring Out the Big Guns?

Rain barrels are often promoted as a "gateway technology" to foster interest in larger rainwater



Photo from Oasis Water Harvesting.

harvesting practices, such as cisterns and passive water harvesting. It's like the training wheels stage for rainwater harvesters.

Rain barrels are a relatively inexpensive investment as well; often you can find free sources of durable 55-gallon drums, which you can retrofit fairly easily. However, it's good to keep in mind that unless you are getting a free rain barrel, the cost of the rain barrel per gallon of water stored is more expensive than installing a larger (400+ gallon) plastic, cement, or steel tank. In general, the bigger the tank, the less expensive the tank is per gallon of water stored.

*(Continued on page 5)*

## Dear Readers,

Last September, the media leaked that WMG was organizing another rain barrel distribution event. Immediately, the office turned into a rain barrel call center as hundreds of people requested barrels and asked questions about parts and installation. In response to the huge public interest, we decided to dedicate our winter newsletter to this topic.

If you're a do-it-yourselfer, check out the rain barrel assembly instructions on pg 4. Or try dusting off your math skills to figure out how much rainwater you can collect from your roof on pg 3. Make sure to read the latest on WMG's programs including: free green streets webinars (pg 5), grey-water and cistern technical trainings (pg 7), and updates from our India office (pg 6).

We hope this newsletter inspires you to collect more rainwater or share this information with a friend or colleague.

Sincerely,

Lisa Shipek, *Executive Director*

## Inside this issue:

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# Partnering with Coca-Cola to Turn Waste into Savings



◀ **Rhiwena Slack, Co-op Coordinator**

Embracing the challenging of filling underserved community needs is an objective that WMG prides itself on. With our rain

barrel distribution project, we didn't know just how much of a need we were taking on. Word that we were selling rain barrels for \$25 spread like monsoon stormwater flooding a wash. Our 200 recycled soda-drums-turned-rain-barrels were met with nearly 500 reservation requests.

This offering was the result of a partnership between WMG, Coca-Cola, and numerous other community groups, including Boy and Girl Scouts groups, to convert former syrup drums into 50-gallon rain barrels ready to hook up to guttering and downspouts.

Coca-Cola was introduced to WMG by United Way of Southern Arizona and was instantly interested in a partnership. Carla Presetti, Coca-Cola Sales Center Administrator said, "Our goal is to return to communities and nature an amount of water equal to what we use in our beverages and their production."

Finding a new use for the drums also helps reduce waste. "Empty syrup barrels cannot be reused and filled as syrup barrels again. Coca-Cola in Phoenix recycles the plastic bins, but it takes a great deal of

energy and water to break down the product and also to make a new product, so if the barrels can be re-purposed, it is always better for our environment," said Carla.

WMG taught Coca-Cola staff how to transform the drums to the highest specifications.

The input hole fits snugly with the litter basket that prevents mosquito access and debris. High quality metal hose bibs are also fitted. The overflow is designed to be directed either to a sunken landscaped area or to another barrel. Coca-Cola absorbed the costs of transportation and labor, plus some materials for retrofitting the barrels.

While these barrels are small and will quickly fill with water, their combined impact can not be ignored.

The 280 barrels distributed so far are helping Tucsonans store up to 14,000 gallons of roof runoff at any one time. They are also helping demonstrate how much runoff can be captured from even a small rain event, and are getting people excited to harvest rainwater.

One new barrel owner, Molly McKinney, eagerly wrote, "Yesterday I set my system up. Last night it rained. This morning the rain barrel is half full! I couldn't resist telling you."

Residents in other cities can use WMG's partnership with Coca-Cola as a model. Work with your neighborhood or community organization to find a company that produces barrels as waste and create a partnership to recycle them into rain barrels for the community. To learn how to outfit the barrels for use, see our DIY rain barrel assembly instructions on page 4. ♠

## WMG Rain Barrel Statistics

- Size: 4 ft tall by 2 ft diameter
- Capacity: 50 gallons
- Color: Opaque white
- Material: Plastic
- 3 distribution events in 2010
- 280 barrels provided in 2010



Coca-Cola staff transported rain barrels for WMG's distribution in Tucson.

# Mini-workshop: How Many Trees Can Your Roof Water?



◀ **Lindsay Ignatowski,**  
*Outreach & Program Coordinator*

Capturing rainwater using rain barrels can provide water for landscaping needs, conserving water by reducing your municipal water use. In effect, you can use your roof to water your trees so you don't have to pay for city water to do so!

## 1. Calculate runoff area.

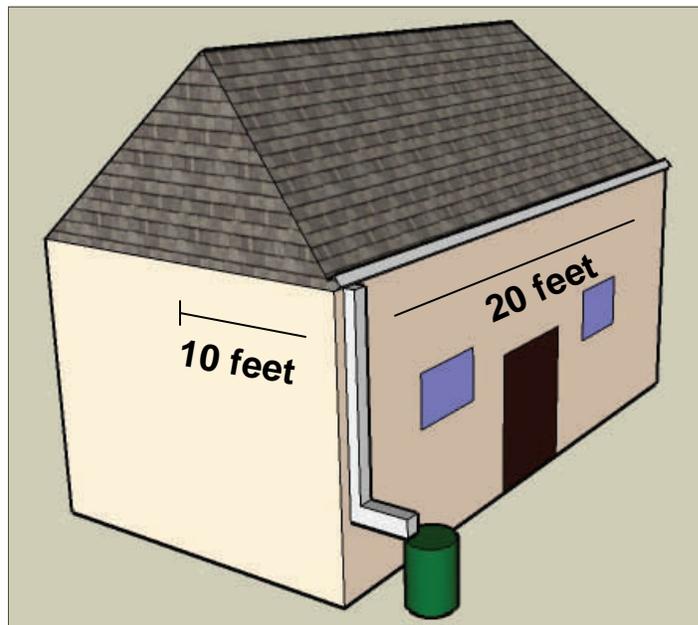
Determine the portion of the roof that feeds water to the downspout attached to your rain barrel. In the diagram above, only water falling onto one side of the roof flows into the rain barrel.

This area is **10 feet x 20 feet = 200 square feet.**

## 2. Consider the rainfall event.

Multiply this number by the number of feet of rain. Look up your city's average yearly rainfall.

- Dry climates (like Tucson, AZ): 12 inches per year = 1 foot per year. **1 ft rainfall x 200 ft<sup>2</sup> catchment area = 200 ft<sup>3</sup> of rain/yr.**
- Midwest climates (like Chicago, IL): 38 inches/yr = 3.17 ft/yr. **3.17ft/yr x 200ft<sup>2</sup> = 633 ft<sup>3</sup>/yr**
- Wet climates (like New Orleans, LA): 64 inches/yr = 5.3 ft/yr. **5.3ft/yr x 200ft<sup>2</sup> = 1,067 ft<sup>3</sup>/yr**
- If you want to see how much rain will fall in just one storm, simply use the number of inches you expect in that storm. A one-inch rainfall is a large storm. One inch = 1/12 foot = 0.083 ft. **0.083ft x 200ft<sup>2</sup> = 17 ft<sup>3</sup> of rain for a one-inch rainfall.**



## 3. Calculate the runoff coefficient.

Not all water falling on the roof runs directly into the gutter; some is absorbed or diverted. For roof surfaces, we assume that about 90%, or .9, of the water flows off the roof into the rain barrel.

- Tucson: **200ft<sup>3</sup> x 0.9 = 180ft<sup>3</sup>** of water flowing into the rain barrel each year.
- Chicago: **633ft<sup>3</sup> x 0.9 = 570ft<sup>3</sup>**
- New Orleans: **1,067ft<sup>3</sup> x 0.9 = 960ft<sup>3</sup>**
- For a one-inch rainfall, this is **17ft<sup>3</sup> x 0.9 = 15ft<sup>3</sup>**

## 4. Convert ft<sup>3</sup> to gallons.

The conversion factor 7.48 is used to convert volume of water to gallons of water.

- Tucson: **180ft<sup>3</sup> of rain per year x 7.48 gallon per ft<sup>3</sup> = 1,346 gal/yr**
- Chicago: **570ft<sup>3</sup>/yr x 7.48 gal/ft<sup>3</sup> = 4,264 gal/yr**
- New Orleans: **960ft<sup>3</sup>/yr x 7.48 gal/ft<sup>3</sup> = 7,181 gal**
- For a one-inch rainfall, you would get **15ft<sup>3</sup> x 7.48gal/ft<sup>3</sup> = 112 gal** of rainwater – enough to fill most rain barrels. 💧

## Creating a Water Budget

- A water budget, like a financial budget, helps you match your available water supply to your water use. With adequate planning, you can water your landscape using only non-municipal water sources.
- First, determine the amount of water available each year from your rain barrel, cistern, greywater system, or other non-municipal water source.
- Then consider the yearly water needs of your plants, including grass, trees, flowers, and vegetable gardens.
- If your water needs outweigh your water supply, reduce your water use or find other sources of water. If your available water is greater than your water use, you can add even more plants for your roof to water!

# Do-It-Yourself Rain Barrel Assembly

*Friendly Warning: This project includes uncommon parts and tools, so ask a friend familiar with plumbing or construction to help you.*



**Catlow Shipek,**  
Senior Program Mgr.

**1. Find a Local Source** recycled from a bottling facility, feed store, or other supplier. Please note that a recycled barrel should only be used for non-potable consumption needs. Avoid barrels previously used for caustic or harmful chemicals or ingredients.

**2. Determine placement.** Place barrels to be convenient to use in garden or for plants.

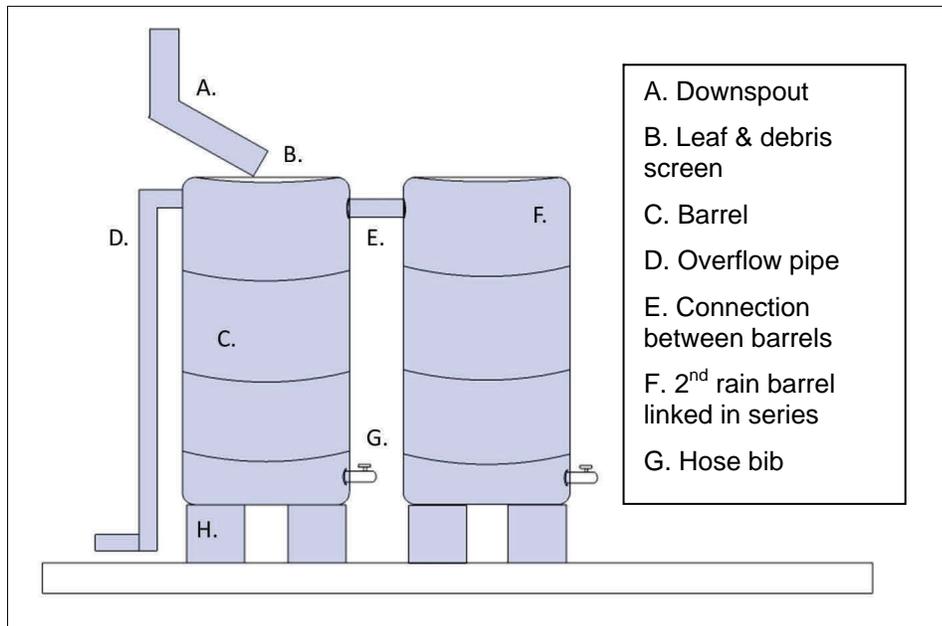
**3. Prepare base.** Level ground surface and place concrete blocks to set barrel a half ft to 1 ft above surrounding landscape to gain extra gravity pressure.

**4. Modify gutter downspout.** Cut downspout and direct to top of rain barrel.

**5. Cut out the inlet hole.** Cut out a hole 6-8" in diameter at the top of the barrel if it doesn't have a removable lid. A hole saw followed by a jig saw makes it easy to cut the holes.

**6. Place the hose bib.** Drill a hole about 6" above the bottom of barrel. Either use a 3/4" bulkhead adapter or a washer and lock nut with some caulking (use a plastic threaded hose bib in this case) to thread the hose bib directly into the barrel. Wrap Teflon tape around the hose bib threads before connecting. We recommend using a full port 1/4 turn hose bib to minimize pressure loss.

**7. Drill the overflow hole.** Drill a hole about 2" from the top of the barrel. Thread in a 2" plastic pipe



- A. Downspout
- B. Leaf & debris screen
- C. Barrel
- D. Overflow pipe
- E. Connection between barrels
- F. 2<sup>nd</sup> rain barrel linked in series
- G. Hose bib

male adapter. Use a lock nut to hold adapter in place.

**8. Extend overflow pipe.** Extend 2" overflow pipe to route excess water to a sunken basin.

**9. Connect a 2<sup>nd</sup> barrel (if desired).** To link multiple barrels in a series, a connector can be placed near the top (just below the overflow) or near the bottom. A connection can be made by following step #5 and using 2" plastic pipe to link both barrels.

**10. Place debris and mosquito screen.** Cover inlet holes with screen material ( $\leq 1$  mm mesh). Fasten to top of barrel. One option is to use short screws with a washer drilled into the top end to hold screen in place.

**11. Paint barrel.** Painting the barrel protects the plastic from UV light to extend its useful life and help prevent algae growth inside.

**12. Wait for the rain!** ☔

## Parts Needed

- Barrel
- Concrete blocks
- 3/4" bulk head fitting (found at plumbing store or tank supplier)
- 3/4" full port hose bib male threaded
- 2" ABS (or PVC) male threaded to female coupling adapter
- 2" street 90° angle and 2" pipe
- 2" threaded lock nut for plastic pipe coupling
- Wire screen ( $\leq 1$ mm mesh)
- Teflon tape
- Gutter downspout and appropriate angles
- Exterior latex paint

## Basic Tools Needed

- Hole saws sized to fittings
- Jig saw
- Hacksaw
- Screw driver & tape measure

# Neighborhood Training in Green Streets Design

## 2011 Free Webinar Series

- February 23, 5:30-7:00 PM (MST): Green Infrastructure Case Studies
- April 27, 4:00 - 5:30 PM (PST): Community-Based Green Infrastructure
- September 14, 4:00 - 5:30 PM (PST): Working Session: Green Infrastructure across the U.S.

Register at [www.watershedmg.org/green-streets](http://www.watershedmg.org/green-streets).

This winter, WMG's Green Streets-Green Neighborhoods program kicked off several ambitious projects to spread the use of green infrastructure (GI) methods across Arizona and the U.S.

Our Neighborhood Leaders program will train 20 residents from six Tucson neighborhoods in design, installation and maintenance of neighborhood-scale GI practices, from street-side rain gardens to traffic calming features that collect and infiltrate stormwater. As an integral part of this innovative program, each participating neighborhood will install GI practices through WMG-led volunteer workshops.

This March, we will bring intensive, hands-on GI trainings to Phoenix and two other Arizona communities. Community workshops will help neighborhoods green their streets and parking lots through GI methods using sustainable stormwater management and urban forestry.

Finally, this February WMG will kick off a free webinar series on green infrastructure for a national audience to share information and lessons learned between communities that have led the way in implementing GI methods. The February webinar will feature speakers from WMG, Portland, Oregon, and Austin, Texas. We'll discuss the creative solutions that communities across North America are taking to address urban environmental issues like stormwater pollution, urban heat island effects, and creating bike- and pedestrian-friendly communities through the use of green infrastructure.

The Green Streets-Green Neighborhoods program is supported by funding from the U.S. Environmental Protection Agency, the Arizona Department of Environmental Quality, and from WMG's donors. ♠

*(Rain Barrel Hubbub, Continued from page 1)*

## WMG's Advice

Try out one or several rain barrels at your home; preferably with recycled materials. Don't invest a lot of money into the rain barrel option until you are sure it's your preferred rainwater storage system. Test out using the rain barrel for six months to a year. If you like it, but want much greater storage capacity, start looking into installing a larger tank. If you don't need more water than your rain barrels provide, then consider upgrading to more functional, more aesthetic rain barrels offered through rainwater harvesting businesses.

Keep in mind the most inexpensive and effective rainwater storage is directly in the soil, so make sure to create sunken basins and berms for passive water collection as the foundation of your rainwater collection. ♠



**Green Infrastructure, such as that featured in our upcoming free webinar series, can capture stormwater to water plant-lined basins.**

# WMG India Establishes Office, Partnership

◀ **Jared Buono**, *WMG India*

2010 was a good year for WMG India.

We partnered with a local organization, opened a new office, and began development of several new, long-term programs. Our new partner is Grampari (Hindi for grameen parayavaran kendra, or rural and environment



WMG's India office

center). A relatively new organization whose mission is to empower and build capacity in rural communities, Grampari has been conducting village training programs near Panchgani, Maharashtra, (a four-hour drive south of Mumbai) for the last two years. Their focus has been on improving income and providing opportunities for rural youth through skills training and entrepreneurship development and strengthening local governance by training elected village leaders. To better meet the needs of the community, Grampari wants to expand into watershed management and sanitation — that's where WMG comes in.

Since September, we've been working closely with Grampari on organizational and program development, while also expanding infrastructure. Opening the new office, a small space provided

courtesy of Grampari, was one of the highlights so far. Several ladies from a neighboring woman's group insisted on helping us set up the place. We've started pilot projects, such as a school handwashing program where we promote hygiene and life saving practices through skits, games, and a tippy-tap building competition (see [watershedmg.org/global-action/india](http://watershedmg.org/global-action/india)). And we've just completed our first watershed assessment with a farming community who receives most of their drinking water from a well that is in steady decline — a prime can-

didate for a groundwater recharge project.

While it's been a busy year so far, it's also been rewarding and fun. WMG is bringing its special brand of hands-on training and community building to a whole new part of the world. And 2011 couldn't be brighter.

Through these initial projects, WMG India is demonstrating its commitment to rural development to potential local donors and partners. Our current need is to raise funds for several relatively small pilot projects, such as a rainwater harvesting tank at our office and a graywater soak pit demonstration in a neighboring village. If you are interested in supporting these projects or want more information, please contact us at [jbuono@watershedmg.org](mailto:jbuono@watershedmg.org). ♠



Students participate in activities during Global Handwashing Day.

# New Innovations in Green Education: WMG's Advanced Watershed Technical Trainings



Participants present site assessments at January's Green Infrastructure course.

## ◀ **Tory Syracuse,** *Project Manager*

WMG's new Watershed Technical Trainings (WTT) program kicked off in January with a three-day advanced course in green infrastructure. Twelve participants from across Arizona and New Mexico were introduced to innovative practices through a green infrastructure tour, hands-on site assessment and design activities in small groups, and green infrastructure implementation workshops.

The group jumped right in to the training with a workshop at Tucson's Ward 2 City Council Office. Curb "cores" were cut to harvest stormwater running off the parking lot, and participants dug basins to capture that water and

planted native trees and shrubs in the parking lot. On the final day, the group implemented water-harvesting infiltration chambers fed by curb cuts in a right-of-way covered by asphalt. Street-side trees and native grasses were planted to provide shade for pedestrians and contribute to the expansion of Tucson's urban forest. The retention of stormwater on site will reduce flooding and enhance water quality.

Participants enjoyed the training's combination of hands-on workshops, design activities, and classroom sessions, as well as the diversity of experience and professional backgrounds of group members. One participant said, "This training helped cement a foundation of design functionality. I feel more confident

## Program Highlights

- Hands-on, one-of-a-kind two to four day training sessions
- Professional instructors; extensive experience in their fields
- Certification available
- Upcoming trainings:
  1. Advanced Greywater, March 31-April 2, 2011
  2. Advanced Cisterns, May 12-14, 2011
  3. Eco-Sanitation, Fall 2011
  4. Stream Restoration, Fall 2011

about seeking opportunities and information on how to get started back [home]."

The WTT program builds upon knowledge and subjects introduced in WMG's Water Harvesting Certification course to offer advanced trainings in greywater, cisterns, eco-sanitation, and watershed restoration. Each session is unique among professional development and green job training programs in the Southwest.

The program's upcoming Advanced Greywater training will cover kitchen resource drains and tank-and-pump greywater systems. The Advanced Cisterns session will explore ferrocement tanks, below-ground tanks, cisterns for potable water, and pump systems (for more details, visit [watershedmg.org/tech-trainings](http://watershedmg.org/tech-trainings))

# Iron Chef Donors Raise Over \$5,000 for WMG!



Four teams of non-professional chefs met the challenge of serving 150 guests with local foods while incorporating our secret ingredient, native mesquite flour, into their delectable dishes.

WMG supporters also stepped up to the plate, raising \$5,045 between Iron Chef event tickets and our silent auction. These funds helped us reach our fundraising goal and will support WMG's community programs.

The event was such a success that we are excited to make it a yearly tradition. Our goal for next year: add locally-produced wine to the mix.

See you at the WMG Local Foods Iron Chef 2012!

## Thanks to Our Many Individual Donors

### International Watershed Level

Anonymous Donor  
Marguerite Fisher

### Flowing River Level

Susan Banes  
Sharon Bart  
Ross Bryant  
Nicole Buono  
Celeste Burgoyne  
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Vicki Lutrick  
Russell McGee  
Shirley Muney  
Diana Rhoades  
Wil & Mai Schaefer  
Melaney Seacat  
Catlow & Lisa Shipek  
Kieran Sikdar  
Evren Sonmez

Tory Syracuse  
Edwin Thompson

### Silver Raindrop Level

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Ginny Beal  
Gita Bodner  
Pierre Bondoumbou  
Curt Bradley  
Christopher Brooks  
Danielle Cariglio  
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Joseph Donovan  
Bill Ellett  
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Tamarha & Keith Evert  
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Carol Nystuen  
Rani Olson

Carol Ann Reinhart  
Martha Retallick  
Thomas Runyon  
Francine Shacter  
Natalie & Eric Shepp  
Kevin Shumaker  
Joe Silins  
Ryan Smith  
Simone Stenger  
David Stevenson  
Mary Jo Swalwell  
Gayland Townsend  
Joan Warfield  
Barbara Warren  
John Young

### Dewdrop Level

Beth Allen  
Evan Apodaca  
Jennifer Arnold  
Joanna Bate  
Christine Bates  
Barbara Buono  
Kimberly Daniels  
Gregory Doppmann  
Dustin & Heather Garrick  
Alexis Greenwood  
Ilene Grossman  
Joan Hall  
Randi Heller  
Bart Hiatt  
Stephen Horras  
Richard Humphrey  
Lindsay Ignatowski  
Bernadette Jilka  
Julie Jonsson  
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Adam Schwartz  
Sareet Shah  
Tara Shultis  
Rhiwena Slack  
Jessica Thompson  
Rachel Van Daalwyk  
Susan Willis  
Rocky Yosek  
Jerry Young  
Alan Ziblat

### Donation Levels

- Dewdrop: \$25
- Silver Raindrop: \$50
- Flowing River: \$100
- River Basin: \$500
- Int'l Watershed: \$1,000

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## Special Thanks

- Thanks to former WMG intern Christine Donley for her enthusiastic outreach efforts as we launched our Conserve to Enhance program.
- Thanks to Jude Clark for donating a 16-foot extension ladder.

## Iron Chef Shoutouts

Thanks to all the volunteers who helped make our Iron Chef a tremendous — and delicious — success:

- Charles Upton, WMG intern, for helping with décor and sponsors.
- Torey Ligon for coordinating a fantastic silent auction.
- Professional caterer Steven Gendel for helping organize our efforts and for providing an array of delicious mesquite deserts.
- Our inspired and much-complimented chefs:

Team Monsoon: Rani Olsen, Jen Block, and Molly Kincaid

Team Med: Tamara McBride and Samantha Shira

Team Street Meat: Gail Ryser and Joe Silins

Team Montana: Ryan Tuack, Will Hobbs, and Jaimee Anderson



**Winning chefs Team Monsoon begin plating their dish. Your Iron Chef funds raised over \$5,000 for WMG!**

Watershed Moment is a quarterly newsletter written by WMG staff and guest contributors, with graphic layout by Lindsay Ignatowski and final editing by Lisa Shipek. If you are interested in submitting to The Watershed Moment, please contact Lindsay at [lindsay@watershedmg.org](mailto:lindsay@watershedmg.org) or at 520-396-3266.

The mission of Watershed Management Group is to develop community-based solutions to ensure the long-term prosperity of people and health of the environment. We provide people with the knowledge, skills, and resources for sustainable livelihoods.