

# This presentation premiered at WaterSmart Innovations

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# Rain, Rain, Don't Go Away!

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BROWN AND  
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# Our Mission



**Water for Life – Ka Wai Ola**

# Education Program



# Construction Materials

## MAKE YOUR OWN RAIN BARREL



### SUPPLIES\*

- ❖ Barrel: 55-gallon food grade plastic barrels
- ❖ 3/4" hose-bib OR
- ❖ 3/4" ball valve set up (includes 3/4" x 1" nipple to connect to the barrel and 3/4" hose end adapter to connect a hose)
- ❖ Teflon tape
- ❖ Drill
- ❖ 7/8" drill bit OR
- ❖ 7/8" hole saw mandrel and 7/8" carbon hole saw
- ❖ 3/4" threading tool (optional): to create threads for the fittings
- ❖ Saw (optional): to cut an opening on the top of the barrel
- ❖ Screen and cut sections of hose (optional): to cover the open areas of the barrel to prevent mosquitoes

### INSTRUCTIONS

1. Wash the barrel thoroughly inside and out.
2. Drill a hole near the bottom of the barrel for your fitting. Remember to leave enough space to fill a watering can or connect a watering hose.
3. Use the threading tool, if available, to create the threads. If one is not available, use a threaded metal pipe to screw into the barrel to create the threads, making sure that it is screwed in straight. Once the hole is threaded, wrap the end of the hose-bib/ball valve nipple fitting with the Teflon tape and screw in the hole.
4. An optional overflow hose can be added near the top of the barrel to direct excess water away from your house. Drill a hole, thread the hole, add a male hose adapter, and then connect a length of hose.
5. Connect your gutter to the rain barrel by cutting the downspout above the barrel and use a length of pvc pipe to connect the downspout to one of the existing holes on the top of the barrel. A 3" diameter pvc pipe will fit most gutter systems. If there is no gutter system, an option is to remove the top of the barrel and place it under the eave to catch the runoff from the roof.
6. Once the barrel is set up and if it has an open top, place a section of screen over the top and cut 5" pieces of rubber hose and cut a slit lengthwise. Secure the hose over the screen and rim of the barrel.

- 1/2" fittings may be used in place of 3/4". Drill bits and threading tool for 1/2" fittings will be easier to find.



# Placement and Maintenance



# Expansion of Systems



Concrete-wooden structure



# Commercial Use





# Class Participant's Feedback

- Awareness of Conservation
- Expansion of the System
- Estimated Water Savings



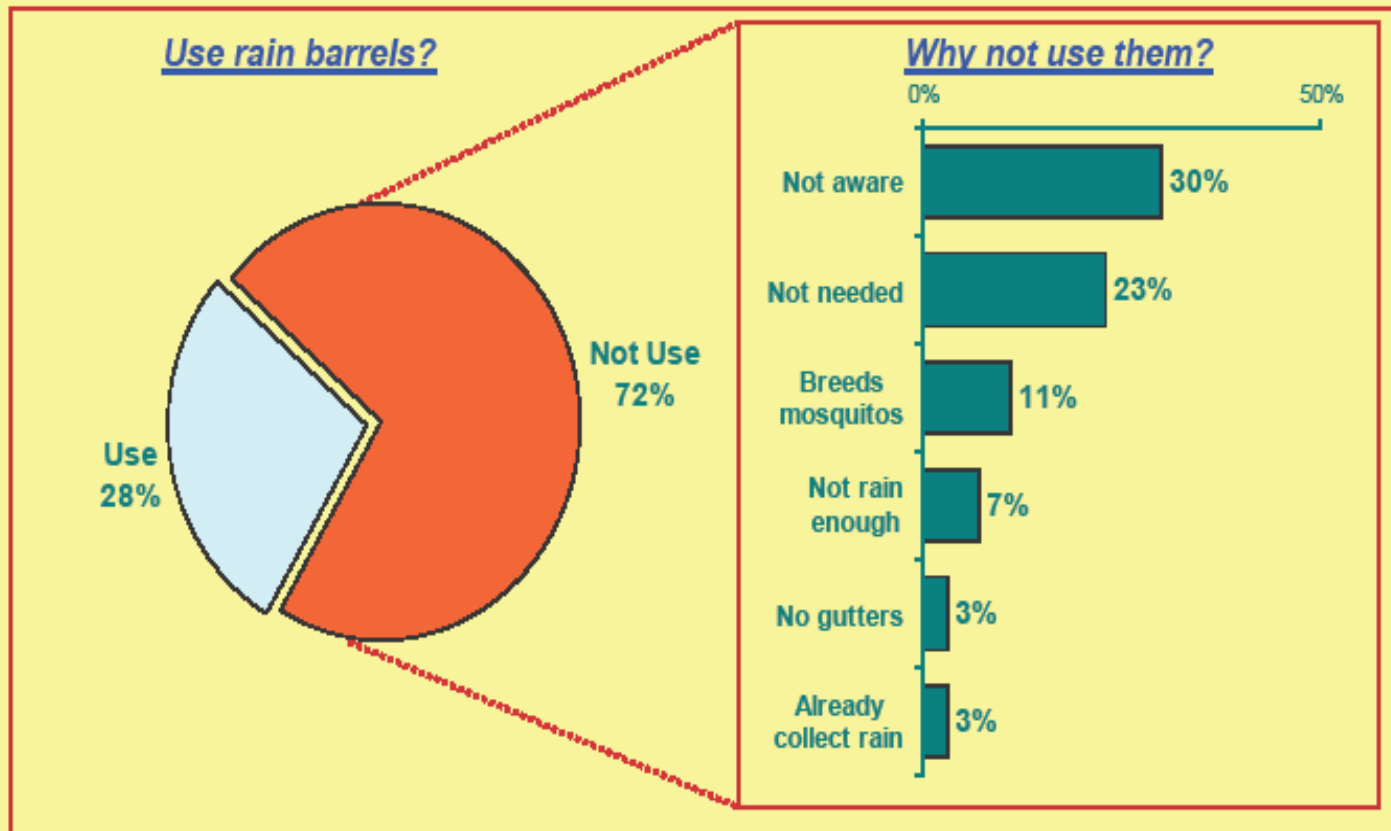
# Our Focus Group's Work



# Market Penetration Study Results

## Reason Not To Use Rain Barrels

Rain barrels have the most room to grow in usage but may need proactive communications to reach optimal use by residents. Of the 72% of households not currently using rain barrels, 30% said they “never thought of it.”



Base: 601 residents of single family detached homes on Oahu.

# BWS' Business Case and other Benefits

- **Benefits**
  - education and awareness (indirect)
  - water savings (direct estimates or measured)
- **Costs**
  - expenses (direct labor and equipment costs)
  - customer upkeep (indirect)
- Only direct benefits and costs to utility are included in economic analysis
- Many “non-quantified” benefits to utility and customers are discussed in classes

# Water Savings Estimates Based on Rain Events

- Storm event to fill one 55-gallon barrel = **> 0.11 inches**
  - assume 800 sf roof area
- **40** = average number of storm events from precipitation records
  - Records available from leeward side (Honolulu)
- **26** = average number of overflows into a second barrel
  - assume 30% customers have second barrels from focus group and market survey data



# Annual Water Savings "Benefits"

- Pilot Program total of 125 customer accts participating since August 2008
  - 88 homes with one barrel (2,200 gal/yr) = 193,600 gal/yr
  - 38 homes with two barrels (1,430 gal/yr) = 137,900 gal/yr
- Total Water Savings = 332,000 gal/yr
- Average = 2,660 gal/yr per household

# Pilot Program Costs

- Free educational classes
- Customers reimbursement per barrel = \$35
- Actual cost to BWS = \$40-50
  - Barrel = \$0 (recycled from local business)
  - Hose bib = \$15
  - Labor and gas = \$25-35
- Non-reimbursed cost to BWS = \$5-15 per barrel



# Business Case Inputs

- 150 barrels for FY2010
- Expand program by 50 barrels per year for next 5 years
- Total Annual Water Savings per Barrel
  - Average 2,660 gals/yr per residential account
- Total Cost to BWS
  - Non-reimbursed from customers = \$5
- Useful life = 10 years
- Avoided Cost = \$400/AF for BWS new source
- Discount rate = 6.0%





# Business Case Results

- 5-yr program total barrels (one per acct) = 1,300
- Total annual water savings = 10.6 AF/yr
- Total lifetime savings = 127 AF
- **Benefit to Cost Ratio = 5.8**
- Discounted Cost of Conserved Water/water saved = \$40/AF
- NPV/water saved = \$192/AF



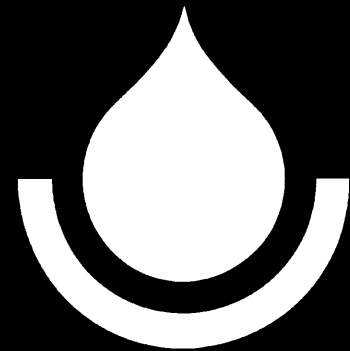
## Summary

- Fulfills BWS' mission and meets conservation goals
- Well received program with growing interest
- More awareness needed for customers from the market study
- Cost effective for BWS given the customers support of \$35 per barrel
- BWS continues to expand the program



## Contact Info

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