

2008 May Four Week Program Deliverable

**A Guide to Water Catchment Construction
A Community Enterprise Solutions Initiative**



Pre-Construction Research: Assess the need/feasibility of a tank

- Frequent shortages of water (How is water currently gathered? How many days a week/month does water flow from the churro?)
- Storage methods are not sufficient to meet the water needs of the family (What containers/methods are currently used to store water?)
- Assess the existing infrastructure to support a water catchment system (What is the condition of the roof/gutters? Is there space for a tank?)
- Measurements for the water catchment system (Are new gutters needed? How many? Where is the spout for the gutter? Where will the tank stand? How much PVC tubing/joints will be needed to bring the water from the gutters to the tank?)

Materials Needed (300* liter tank):

Costales in good condition (2* bags)

Saw Dust (4* costales)

Concrete Mix (2 parts sifted gravel, 2 parts sand, 1 part cement, .25 part lime, and water)

Chicken Wire (1 to 1.5* meters)

PVC Tubing (.5* inch by 30* cm long)

Faucet *churro* (.5* inch)

PVC Tubing attached to gutter (3 inch; length depends on assessment)

PVC joints (3 inch; number depends on assessment)

Plastic bowl *palangana* for lid

Tape

Gutters (pending your assessment)

Gutter holders (pending your assessment)

Wire (for holding PVC tubing to gutters)

*number depends on tank size

Tools Needed:

Concrete mixing and spreading tools

Wire Cutters

Hand Saw

Wheel Barrel

Preparation for tank:

Base: Identify where the tank is going to stand. The tank should be as close as possible to the spout of the gutter. Additionally, the tank should be covered or in the shade during the drying period. Clear and level the area under the tank prior to construction. The concrete can be laid directly on the ground or a plastic sheet can be used.



Mold: Cut the costales lengthwise and sew together the desired number to make a cylindrical shape. Sew a circular costal to the bottom of the cylinder. A strong stitch is necessary to hold the shape under pressure. Stuff the stitched costal with the saw dust. If saw dust is not available use local alternatives (dirt, sand, hay, grass, corn husks, etc). It is important that the sacks are packed tightly to avoid slack in the walls. The tighter the stuffing, the less possibility for the concrete to fold over on the sack. Seal the top with tape, string or nylon so that no saw dust is visible.



Tank Construction:

Floor: Mix the concrete for the base. The concrete should be thick enough to lay free standing but improvised molds can be used if desired. The floor should be approximately 1.5 inches thick (a). The floor must be larger than the diameter of the stuffed costal. The simple concrete mix should be poured and smoothed. Let the concrete floor set for 45 minutes. If a mold was used it should be removed and the .5 inch PVC tube (with churro) should be placed on the floor and under the “costal mold” (b). It is important that the pipe is angled downward and that it is placed in the middle of the tank. Additionally, the churro should be accessible for filling buckets, pots, etc.



(a)



(b)

Tank Walls: Place the stuffed costal on top of the floor and PVC pipe with faucet. Uniformly cover the walls of the sack with a layer of concrete approximately .5 inches thick. (a) This process requires patience as the consistency of the concrete is very important. Place the plastic bowl on top of the tank and cover the top of the costal. Fill half of the bowl with concrete, this will represent the lid (b). The bowl should be large enough to enable the user to empty and clean the tank. Let the concrete set for 45 minutes.



(a)



(b)

Metal Reinforcement: Cover the tank with chicken wire (a). Excess wire should be trimmed. This process must be executed with care because it is important that the wire does not pierce the first layer of cement. Secure the wire to the tank either by tying it or binding it to itself. There should be no gaps between the wire and cement. Cut the excess chicken wire into a doughnut shape to cover the top of the tank where cement has been poured. After the wire is secured apply a second layer of concrete .5 inches thick. (b) Cover the tank with wet newspaper and wait 2 days.



(a)



(b)

Final Steps: After the two day waiting period, cut the costal and carefully empty the saw dust from the opening (a). After the saw dust is removed, carefully peel out the costal (b). Clean the tank of debris and sprinkle the inside of the tank with concrete mix. Wait for two more days before filling the tank with water.



(a)



(b)

Gutter System:

Clean Roof: Identify the water collecting surface that the system will be using. Clean roof if needed. This process can be completed prior or during tank construction. The quality of the cleaning directly affects the water flow and quality.



Installation: If the house does not currently have gutters, install gutters.



Connection: Attach the PVC piping to the gutters and secure the piping depending on existing structures. Angle the PVC towards the tank and reinforce to support water weight.



Water Catchment Cost Analysis
(price based on a 300 liter tank)

Name of Material	Cost Per Unit (Q)	Total Number of Units (Q)	Total Cost (Q)
Open-Ended Gutter	23.00	3	69.00
Gutter with Endplate and Spout	40.00	1	40.00
Sub Total			109.00
Meter of 3-In. PVC Tube	12.50	2	25.00
3-In. PVC Tube Joints	15.00	2	30.00
Meter of Chicken Wire	8.50	3	25.50
Bag of Sawdust	1.50	4	6.00
Costal	7.50	2	15.00
Sewing Costs	5.00	1	5.00
Large Palangana	6.00	1	6.00
1 Meter Small PVC Pipe, 1 PVC Faucet, 1 PVC Joint	20.00	1	20.00
Pound of Calcium Oxide (Lime/Cal)	1.00	11	11.00
Concrete	50.00	1	50
“Carreta” of Sand	15.00	2	30
“Carreta” of Gravel	10.00	2	20.00
Sub Total			243.50
Total			Q352.50