

# HANDWASHING STATIONS

An easy-to-use technological and context-based Handwashing Stations manual





Government of the People's Republic of Bangladesh

**Institute of Epidemiology, Disease Control and Research (IEDCR)**

Mohakhali, Dhaka -1212, Bangladesh

Tel: 9840376, 9898796, 9898691 Fax: 9880440

e-mail: director@iedcr.gov.bd; info@iedcr.gov.bd



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FOREWORD

I am pleased to see this booklet on innovative and low-cost hand washing devices developed by WaterAid Bangladesh. During this coronavirus outbreak, hand washing is a potential preventive approach to stay safe and frequent hand washing helps to remain healthy from many other diseases as well.

Pity is that different sections of populations do not have scope for handwashing facility within their premises, especially in urban slums and it is a challenge in common public places.

All these interesting and new ideas will create scope for all, especially poor, underserved communities to practice frequent handwashing and handwashing at critical times.

Being a technical partner of WaterAid, I like to request you all to disseminate these great ideas widely and contribute to developing a healthy nation.

**Professor Dr. Meerjady Sabrina Flora**

Director,

Institute of Epidemiology, Disease Control and Research (IEDCR)

Ministry of Health and Family Welfare

Government of the People's Republic of Bangladesh

Mohakhali, Dhaka-1212, Bangladesh.

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# Introduction

**WaterAid Bangladesh is an international non-government organization (NGO) dedicated exclusively to the provision of safe water, sanitation and hygiene awareness to the world's poorest people. WaterAid has been working in Bangladesh since 1986 to improve hygiene behavior and access to water and sanitation services for poor communities giving emphasis on demonstration of innovative approaches, participatory methods, gender and vulnerable groups and sustainability.**

Hand washing (or handwashing), also known as hand hygiene, is the act of cleaning hands for the purpose of removing soil, dirt, grease, and microorganisms. To promote good hygiene behavior, hand washing is first and basic priority. Now, only advice without providing any hand washing facilities will not achieve our desired goal.

Implementing handwashing station to promote hygiene behavior effectively, WaterAid has prepared a document for various technological options of handwashing stations including cost estimation depending on geographical context.

## Design Consideration

The proposed devices will have to be selected and customized with the following considerations to make the device operational and sustainable

- **Geographical context**
- **Safe wastewater disposal**
- **Availability of space**
- **Utilization of locally available materials**
- **Nature of water supply**
- **Material Cost**
- **Accessibility (Child and disable friendly)**
- **Provision of handwashing agent**

## Technological Options for Handwashing Stations

### Barrel Type



#### Materials

Oil barrel, sink, pillar cock (lever type), magic pipe, connection pipes, plumbing fittings accessories

#### Making process

Take an oil barrel and make a hole on the top to place the sink. Make another hole to install pillar cock. Connect magic pipe with sink and punch a hole at the bottom of barrel to drain out the wastewater through magic pipe. Connect water supply (from running water or reservoir) to pillar cock with necessary plumbing fittings and the device is ready to use. For beautification and branding, paint the total device and add branding materials.

#### Specifications

- **Size: 23.5" diameter, 33.5" height**
- **Individual usage**
- **Portable**
- **Connection type: running water supply**
- **Water reservoir can be added if no source of running water**
- **Applicable at little space (slums' or other entry/exit points)**

**Device Cost BDT 3,200 or USD 38**

including 20 ft running water supply connection



# Metal Frame Type



## Materials

MS angle 1" X 1",  
CI sheet, sink,  
magic pipe, pillar  
cock, connection  
pipes, plumbing  
fitting accessories

## Making process

Cut a piece of MS angle and make frame of 4' L X 2' B X 2.5' H. Put two sink on the top of the frame and fix with frame by welding. Fill the rest gaps with CI sheet. Fix pillar cocks and magic pipes with sink. Connect water supply (from running water or reservoir) to pillar cock with necessary plumbing fittings and device is ready to use. For beautification and branding, paint the total device and add branding materials.

## Specifications

- Size 4'L X 2'B X 2.5'H
- Group usage (2 unit)
- Portable
- Connection Type: Running water supply
- Water reservoir can be added if no source of running water
- Single line usage
- Applicable at public places
- Plastic basin can be used to reduce the cost

**Device Cost BDT 6,400 or USD 75.5**

including 15 ft running water supply connection

# Paddle Type



## Materials

SS hollow box bar  
1" X 1", SS sheet,  
1" UPvC T, 0.5"  
niple, connection  
pipe, magic pipe,  
pedal faucet, nut,  
1" uPvC Pipe,  
waste pipe (1.5"),  
inlet pipe (1")

## Making process

Cut a piece of SS hollow box bar and make frame of 4' L X 2' B X 2.5' H. Make a trapezoidal shape large sink (as shown in picture) with SS sheet and fix with frame by welding. Sink should be in a slope to drain out the wastewater. Fix pedal faucet, magic pipe and connection pipes with necessary plumbing fittings. Connect water supply (from running water or reservoir) to pillar cock with necessary plumbing fittings and device is ready to use. Use branding materials and messages related to handwashing.

## Specifications

- Size 4'L X 2'B X 2.5'H (Single Side)
- Group usage (Front 3 and can be added more 3 if extend backside)
- Soapy Water Holder/ Soap Spray Device
- Paddle Type Tap (with large pad)
- Sprinkler type tap head (Preferable)
- Ensure proper drainage.
- Connection Type: Running water Supply
- Optional: Motor, Water Reservoir with or without stand

**Device Cost BDT 20,000 or USD 236** (Approx.)

# Linear Plastic Basin and Drum Type



## Materials

Rfl plastic basin, plastic bib cock, plastic drum, magic pipe, connection pipe, MS angle, plumbing accessories, soapy water

## Making process

Make a frame size of 6" X 3.5" X 2.5' as shown in picture with MS angle to store plastic drum on the top and fix two plastic basins. Place plastic drum on the top of MS frame and fix the water source connection at the bottom of the drum to distribute water for handwashing. Fix bib cocks and connection pipes with necessary plumbing fittings. Fix magic pipes with basin and discharge the other points in the drainage line. Use color and message for branding.

## Specifications

- Size 6' X 3.5'
- Group usage (02 persons)
- Portable
- Lever Tap
- Soapy Water Holder/ Soap Spray Device
- Ensure Running Water
- Ensure Proper Drainage

**Device Cost BDT 7,500 or USD 88.5** (Approx.)



# Drum Type



## Materials

Drum (150 ltr. Capacity), plastic box, bib-cock or bib tap, MS angle 1" x 1", magic pipe, connection pipe, plumbing fitting accessories.

## Making process

Make a platform with MS angle to rest the drum on the top. Total height of the frame will be 2.5'. Place the drum on the frame and make a punch hole on the drum to connect bib cork. Two bib-cock will be connected by T-Joint. Install a plastic rectangular box below the bib-cock which will use as group sink. Fix magic pipe/ flexible pipe with the plastic box for wastewater outlet. As the drum will act a water reservoir, running water supply connection is optional. After filling water in the drum, the device is ready for use. Use branding materials and messages related to handwashing.

## Specifications

- **Size: 24" dia drum, from floor**
- **Group (2 unit) usage**
- **Built in water reservoir (capacity of 150 Ltr)**
- **Lever Tap**
- **Ensure proper drainage**
- **Optional: Motor**

**Device Cost BDT 4,500 or USD 53**

including 30 ft running water supply connection (Approx.)

# Circular Tank Type



## Materials

Drum (150 ltr. Capacity), plastic basin, bib-cock, MS angle 1" x 1", magic pipe, plumbing fitting accessories

## Making process

Make a platform with MS angle to rest the drum on the top. Total height of the frame will be 2.5'. Place the drum on the frame and make four (04) punch hole on the drum to connect bib cocks. Install four (04) plastic basins in a circular way (as shown in picture) and fix with screw. Fix magic pipe/ flexible pipe with the plastic box for wastewater outlet. As the drum will act as a water reservoir, running water supply connection is optional. After filling water in the drum, the device is ready for use. Use branding materials and messages related to handwashing.

## Specifications

- Size: L 23" x H 2.5' x W 23"
- Group usage (circular way: 4 persons)
- Built in water reservoir (200 ltr. capacity)
- Lever Tap
- Soapy Water Holder/ Soap Spray Device
- Optional: Motor

**Device Cost BDT 10,500 or USD 124** (Approx.)

# Wall Mounted Pipe System



## Materials

Plastic basin, bib cock, magic pipe, connection pipe, uPVC pipe 1", clamp, plumbing fitting accessories

## Making process

Fix the plastic basins on the wall with a height of 2.5'. Fix the water supply pipelines and magic pipe on the wall with clamp (as shown in image). Fix bib cocks at the selected point with necessary plumbing fittings. Connect the entire line with running water supply or water reservoir based on context. Use color and message for branding.

## Specifications

- Group usage (04 persons)
- Fixed structure
- Lever Tap System
- Queue marking
- Soapy Water Holder/ Soap Spray Device
- Connection type: Running water supply
- Ensure proper drainage
- Optional: Motor, Water Reservoir with stand or without stand

**Device Cost BDT 8,142 or USD 96**

including 20 ft running water supply (Approx.)

# Linear Both Way MS Type



## Materials

Bib cock, CI sheet, MS angle 1" X 1", 1.5" uPVC pipe, magic pipe, pipe joint, plumbing fitting accessories

## Making process

Make a frame size of 10' X 20" X 2.5' with MS angle. Install a group sink with CI sheet and then place it on the frame with welding. Sink should be in a slope to drain out wastewater. Fix bib cocks with uPVC pipe on the top middle of the sink in both side (as shown in picture) at the selected point with necessary plumbing fittings. Connect the entire line with running water supply or water reservoir based on context. Fix a magic pipe at one corner of the sink to drain out wastewater. Use color and message for branding.

## Specifications

- **Size: 10' X 20" X 2.5'**
- **Group usage (05 and above)**
- **Lever Tap System (Plastic)**
- **Soapy Water Holder/ Soap Spray Device**
- **Connection type: Running water supply**
- **Water reservoir can add if no source of running water**
- **Both single- and double-line usage**
- **Ensure proper drainage**
- **Optional: Motor, Water Reservoir with or without stand**

**Device Cost BDT 10,000 or USD 118** (Approx.)

# Linear SS Type



## Materials

SS hollow box bar  
1" X 1", SS sheet,  
1" UPvC T, 0.5"  
niple, connection  
pipe, magic pipe,  
SS pillar cock, nut,  
1" uPvC Pipe,  
waste pipe (1.5"),  
inlet pipe (1")

## Making process

Cut a piece of SS hollow box bar and make frame of 4' L X 2' B X 2.5' H. Make a trapezoidal shape large sink (as shown in picture) with SS sheet and fix with frame by welding. Sink should be in a slope to drain out the wastewater. Fix SS pillar cock, magic pipe and connection pipes with necessary plumbing fittings. Connect water supply (from running water or reservoir) to pillar cock with necessary plumbing fittings and device is ready to use. Use branding materials and messages related to handwashing.

## Specifications

- **Size: 5'x2.5'x2.5'**
- **Group usage (03)**
- **Portable**
- **Connection Type: Running water Supply**
- **Water reservoir can add if no source of running water**
- **Both single and double line usage**
- **Applicable at public space with proper water drainage facility**

**Device Cost BDT 10,400 or USD 124**

including 10ft running water supply connection



# Linear MS frame with Plastic Basin Type



## Materials

MS hollow box 1" X 1", plastic basin, magic pipe, pillar cock, connection pipes, plumbing fitting accessories

## Making process

Cut a piece of MS hollow box and make frame of 6' L X 2' B X 2.5' H. Put three plastic basins on the top of the frame and fix with frame with screws. Fix pillar cocks and magic pipes with basins with necessary plumbing materials. Connect water supply (from running water or reservoir) to pillar cock with necessary plumbing fittings and device is ready to use. For beautification and branding, paint the total device and add branding materials.

## Specifications

- **Size: 6'x2'x2.5'**
- **Group usage (03)**
- **Portable**
- **Connection Type: Running water Supply**
- **Water reservoir can add if no source of running water**
- **Both single and double line usage**
- **Applicable at public space with proper water drainage facility.**

**Device Cost BDT 5,963 or USD 70.5**

including 10 ft running water supply connection

# Linear MS Type



## Materials

Bib cock, CI sheet, MS angle 1" X 1", 1.5" uPVC pipe, magic pipe, pipe joint, plumbing fitting accessories

## Making process

Make a frame size of 9' X 16" X 2.5' with MS angle. Install a group sink with CI sheet and then place it on the frame with welding. Sink should be in a slope for drain out wastewater. Fix bib cocks with uPVC pipe on the top middle of the sink in both side (as shown in picture) at the selected point with necessary plumbing fittings. Connect the entire line with running water supply or water reservoir based on context. Fix a magic pipe at one corner of the sink to drain out wastewater. Use color and message for branding.

## Specifications

- Group usage (04) or more
- Lever Tap
- Soapy Water Holder/ Soap Spray Device
- Ensure Running Water
- Ensure Proper Drainage
- Optional: Motor, Water Reservoir with stand or without stand

**Device Cost BDT 7,410 or USD 87.5**

# Fixed-base Circular Tank Type



## Materials

500 litre Water Reservoir, Lever bib cock, plumbing fitting accessories

## Making process

Make a raised brick platform as demonstrated in the picture. Set a circular RCC slab on the platform and a 500 ltr reservoir on the slab. Punch 4 holes to bottom of the water tank in circular way and then fix bib-cocks there with necessary plumbing fittings. Set a drainage line at the bottom corner of the brick platform to drain out wastewater. Ensure slope and connection holes at the base to flow wastewater. To fill the reservoir, use a 1HP pump. Use proper branding and messages.

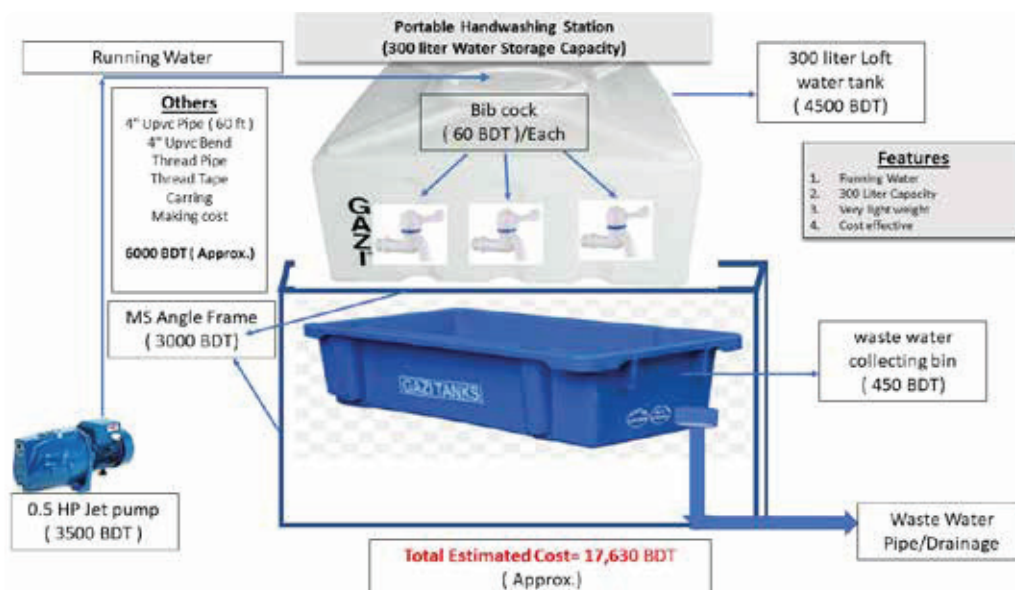
## Specifications

- Group usage (04 persons)
- Fixed structure
- Lever Tap System
- Queue marking
- Soapy Water Holder/ Soap Spray Device
- Connection type: Running water supply
- Ensure proper drainage
- Optional: Motor

**Device Cost BDT 40,230 or USD 473**

including 20 ft running water supply for 4 persons (Approx.)

# Loft Tank Type



## Materials

MS angle 1" X 1",  
 Loft water reservoir  
 (300 ltr.), Bibcock,  
 Tank & Bibcock  
 fittings materials,  
 plastic box,  
 plumbing fittings  
 accessories  
 Electric Pump 1Hp,  
 Electric Pump GI  
 Box

## Making process

Make a raised platform size of 3' L X 3' B X 2.5' H with MS angle. Put the loft water reservoir on the top of the platform. Punch hole on the selected side of the tank and then fix bib cock with necessary plumbing fittings. Fix plastic box which will be used as group sink. Make a drainage line at a corner of the plastic box to drain out the wastewater. To store water in the reservoir, use a 1 HP pump to pump in the water. Use branding materials and message.

## Specifications

- Group usage (square way)
- Portable
- Built in water reservoir (300 ltr. capacity)
- Can connect through running water supply with pump for refilling
- Applicable at semi wide area with drainage facility to access in square pattern
- Multipurpose box can be replaced by shine deluxe plastic white basin (price may vary)

**Device Cost BDT 17,630 or USD 207.5 (Approx.)**



# Tippy Tap



## Materials

**5 Ltr Gallon or Bottle, 6 Nos.**  
**Stick (minimum dia 1", length 4' each),**  
**3 m Rope, 0.5 cft**  
**Gravel/ loose soil,**  
**Soap/Soapy water**

## Making process

Make two small holes in two side of the gallon/bottle. Then, construct a frame using five sticks. Tie one side of the rope to opening of the bottle and other side to another stick. Lastly pour water into the bottle and hang it to middle stick of the frame. Hang a soap case or bottle from the stick.

## Specifications

- **Individual Usage**
- **Portable**
- **Built in water reservoir (5 ltr. capacity)**
- **Applicable to low income community/ village**
- **Stick can be replaced with tree branches to minimize the cost. In most cases, considering the context, no cost will require for this item.**
- **Gravel like brick chips or other aggregates and loose soil is locally available. Considering the context, no cost will require for this item.**

**Device Cost BDT 200 or USD 2.35** (Approx.)



# Household Level Handwashing Stations at Rural Areas



**Device Cost BDT 200-400 or USD 2.4-4.8** (Approximately)

# Ready Made Handwashing Stations



65 Liter Tank with  
Tap & No Handle,  
Dia=420mm,  
H=520 mm,  
Weight=3-3.50 Kg,  
Color- Black, Blue,  
White

BDT  
1,020  
or  
USD  
12



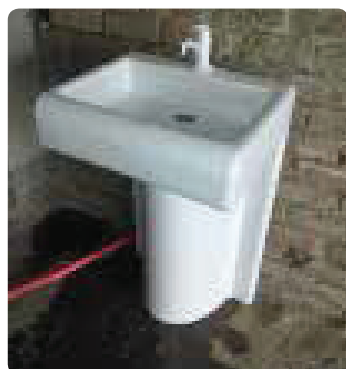
20 Liter Tank with  
Tap & Handle,  
Dia= 270 H=415 mm,  
Weight=1.1 - 1.2 Kg,  
Color-Red, White,  
Black.

BDT  
450  
or  
USD  
5.3



Plastic-  
Basin with Tap,  
Basin Stand  
( H-33",W-22)

BDT  
860  
or  
USD  
10.2



Plastic-  
Basin with Tap,  
Basin Stand

BDT  
2,770  
or  
USD  
32.6

# Water Reservoir, Bib Cock and Pillar Cock



**Water Tank**  
(Capacity-300L-  
10000 Liter)  
Brand: Gazi, RFL or  
any renowned brand

**BDT**  
**6.8**  
**or**  
**USD**  
**0.08**  
**per liter**



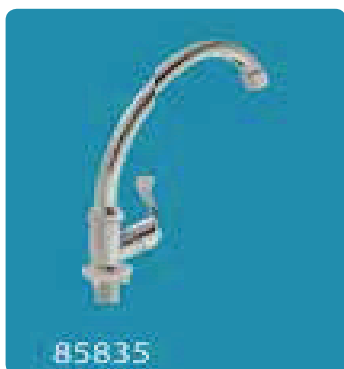
**Water Tank**  
(Capacity-500Ltr.)  
with support stand  
build with MS angle  
(1.5" X1.5") and  
plumbing fittings  
Reservoir  
Brand: Gazi, RFL or  
any renowned brand

**BDT**  
**12,775**  
**or**  
**USD**  
**150.2**



**Nickel coated PVC**  
**Bib-cock**

**BDT**  
**110**  
**or**  
**USD**  
**1.3**



**Nickel coated PVC**  
**Pillar-cock**

**BDT**  
**210**  
**or**  
**USD**  
**2.5**

# Keeping water device and Handwashing stations safe



WHO recommends on surface that effective inactivation can be achieved in 1 min using 70% ethanol or sodium hypochlorite. Sodium hypochlorite at 0.5% (equivalent to 5000 ppm or 1-part sodium hypochlorite to 9 parts water) solution is also very effective to disinfecting surfaces of hand washing stations, water tap. This compound is commonly known as liquid bleach, which has a pale yellow to green colour. Moreover, it is a common household chemical. Although by itself it has no harmful effects, it produces chlorine gas when mixed with acid, so carefully handling is required. 0.5% chlorine solution could also be prepared using locally available Bleaching powder (35% chlorine content). One litre of clean water is recommended to mix with around 15 gm (3 teaspoons) of bleaching power.

## Warnings for use:

Please wear appropriate protective gear while you prepare or use it to disinfect so that it does not get on your skin, mucosa, clothing or get into your eyes. Remember that It is extremely unstable when exposed to air, heat, light or metal and the effective chlorine concentration gradually reduces if left alone. It is best to use with in 24hrs once prepared and keep in a airtight bottle.

## Environmental risk:

Sodium hypochlorite is very toxic to aquatic organisms. However, as the substance is extremely reactive, any sodium hypochlorite that is poured into the drain from household use will react with organic matter and will be removed before reaching the environment.



For more information



WaterAid Bangladesh  
[wateraidbangladesh@wateraid.org](mailto:wateraidbangladesh@wateraid.org)

Photos: WaterAid Bangladesh, WaterAid Partners

Design: Drik

