

1 US\$ = 37 ETB Target cost = 45 US\$

Dimensioni x disabili <https://macchedil.com/store/bagni-chimici-wc/wc-chimico-disabili-per-cantieri-e-fiore-speedy-pee/>
 Dimensions 1 x 1 x 2 + tetto 1,5 x 1 dimensioni bagno da cantiere norma EU <https://www.giulianogroup.eu/blog/bagni-chimici-in-65%trucioli+35%portland>
 Area panels 11.25 m2 quantità Pc 43.70625 costo ceme 4.725
 disegno bagno cantiere <https://macchedil.com/store/bagni-chimici-wc/wc-chimico-disabili-per-cantieri-e-fiore-speedy-pee/>
 disegno bagno x disabili https://www.archweb.it/dwg/bagni_publici/bagni_disabili/bagni_disabili.htm
 archetipo bagno da cantiere <https://macchedil.com/store/bagni-chimici-wc/bagno-coibentato-scarico/> e disegni dello stesso <https://macchedil.com/store/bagni-chimici-wc/bagno-coibentato-scarico/>
 Il più economico, non a norma perché non coibentato <https://macchedil.com/store/bagni-chimici-wc/box-bagno-in-lamiera-zincata/>

	qty	price ETB	Total US\$	
verifica densità celenit				
densità apparente trucioli di legno	100			
densità portland	1400			
65%trucioli+35% portland	555 kg/m3	11.1 kg/m2		
densità Celenit 20 mm	500 kg/m3	10 kg/m2		
eucalyptus pole D120 mm x 8 m	4	160	17.2973	
hinges	2	25	1.351351	https://con.2merkato.com/prices/material/7/601
Steel wire 1,5 mm	1	51	1.378378	https://con.2merkato.com/prices/material/2/55
Nails 12 cm	0.3	120	0.972973	https://con.2merkato.com/prices/material/4/69
bricks for the floor (6x12x24)	33	5	0.405405	https://con.2merkato.com/prices/material/4/58
(Door) Chip Wood - 8mm thick	250	2	13.51351	https://con.2merkato.com/prices/material/5/434
			34.91892	
hollow concrete block (10x200x400=	15	9	3.648649	https://con.2merkato.com/prices/material/4/59
concrete (100 kg)	1	400	10.81081	https://con.2merkato.com/prices/material/2/18 , in Ethiopia 1 quintal = 100 kg https://www.igi-global.com/dictionary/quintal/79340
Timber 2.5cmX30cmX400cm - Ethiopian (\$	300	2	16.21622	https://con.2merkato.com/prices/material/5/361
Battens - 40X50mmX4m - Austria	60	4	6.486486	https://con.2merkato.com/prices/material/5/73
Corrugated sheet G35 https://con.2merkato.com/prices/material/5/73	200 ETB/pc	5.405405 US\$	875 mm x 2000 mm https://www.ethioconstruction.net/?q=contact-address/alemgenet-trade-and-industry-plc	
door 0,6x2 m	2900 ETB/m2	125.4054 US\$		
Plywood 1,2x2,4	1000 ETB/pc	27.02703 US\$		
Wall tiles	320 ETB/m2	8.648649 US\$		
Tarpaulin 9'x12' =2,7 x 3,6	709 ETB/pc	19.16216 US\$		
Tarpaulin 300 g/m2 (Alibaba)		2 US\$/kg	22.5	
			1.145913	
PVC pipe DN 50 mm (2 m pc)	120 ETB/pc	3.243243	https://con.2merkato.com/prices/material/12/248	
PVC pipe DN 110 mm	550 ETB/pc	14.86486	https://con.2merkato.com/prices/material/12/250	
Clear glass 3 mm Thick	270 ETB/m2	7.297297	https://con.2merkato.com/prices/material/9/159	
Aluminium foil 15 m x 0,3 m		2 price in supermarket in Italy		
PE foil	0.5 US\$/m2		https://www.amazon.com/Greenhouse-Plastic-Polyethylene-Covering-Solution/dp/B00B8MHKK	
Ribbed Metal Sheet - 0.4 mm Thickness	100 ETB/m2	2.702703	https://con.2merkato.com/prices/material/7/780	
plastic syphon pump	1	\$ 1.66	Price in South Africa https://www.superbuy.co.za/syphon-pump-manual-54cm.html	

Palm leaf weaving technique <https://youtu.be/OH5h5kNMqpo>
 palm leaf weaving, better finishing <https://www.youtube.com/watch?v=jcgcVmWhRac>
 Cattail weaving <https://youtu.be/JmBQNGHZQAK>
 reed mat weaving with fibre strings or steel wire <https://youtu.be/aGUWZDjVQTI>
 bamboo fishbone weaving <https://youtu.be/PagyDG2MPMM>
 weaving whole palm leaves <https://youtu.be/SkhVKdKpAp8>
 making a hut's door with a split palm leaf <https://youtu.be/xrMpe4gnhsg>
 Another technique, with the full leaf <https://youtu.be/8NnRW57Eaw>
 Toilet wall weaving <https://youtu.be/UMcUDFH-ZY8>
 panel made of a bamboo frame ad bamboo strips <https://youtu.be/2gWK8Xyovn4>

Non c'è prezzo calce idrata in Etiopia
 Prezzo Leroy Merlin 0,11 €/kg x 25 kg <https://www.leroymerlin.it/catalogo/calce-idraulica-25-kg-34699756-p>
 Idem cemento 0,15 €/kg x 25 kg <https://www.leroymerlin.it/catalogo/cemento-italcementi-32.5-25-kg-30691773-p>
 assumere slaked lime = 0,75 x prezzo cemento

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Vegetal fibres (kg)	78.65	0	\$ -	65% of the panel's weight, density of the panel 10 - 11 kg/m ² , 11 m ² necessary
Portland cement (panels plus plastering, kg)	44.4675	4	\$ 4.81	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Galvanized steel angle brackets 50 x 30 x 35 x 1,8 (pcs.)	14		\$ 4.20	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.detail.6.5.6464e37edWgVM
Galvanized steel screws for wood, 40 mm and 20 mm, M4.8 (kg)	1	100	\$ 2.70	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Spent time for painting and waterproof mortar (kg)	5	3	\$ 0.41	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	30	0.7	\$ 0.57	https://con.2merkato.com/prices/material/2/21
Door Hinges (pcs)	3	25	\$ 2.03	https://con.2merkato.com/prices/material/7/601
Ventilation fine wire mesh (m2)	0.6	150	\$ 2.43	https://con.2merkato.com/prices/material/7/798
Total Material Cost, basic superstructure			\$ 17.14	
If installed in areas with risk of Class 1 hurricane (119 km/h windspeed), additional cost for bracing				
Galvanized wire 2.5 mm diameter (guys)	0.5	34	\$ 0.46	price per kg https://constructioninethiopia.com/construction-materials-in-ethiopia/
Stakes for the guys (4 x steel bars 20 mm x 400 mm, 1 kg each, unit price in ETB/kg)	4	38.8	\$ 4.19	https://con.2merkato.com/prices/material/2/31
<i>Total material cost for guys and stakes</i>			\$ 4.65	
Total material cost, braced superstructure			\$ 21.80	

Water tank integrated on the roof				
Item	Qty	m2 additional panels		Remarks
		Price ETB	US\$	
Vegetal fibres (kg)	14.4	0	\$ -	65% of the panel's weight, density of the panel 10 - 11 kg/m ² , 11 m ² necessary
Portland cement (panels plus plastering, kg)	18.6	4	\$ 2.01	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Spent time for painting and waterproof mortar (kg)	0.5	3	\$ 0.04	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	2.5	0.7	\$ 0.05	https://con.2merkato.com/prices/material/2/21
Flexible plastic tube 1/2" for the clean water (m)	2	20	\$ 1.08	https://con.2merkato.com/prices/material/11/174
plastic garden spray valve	1	29 ZAR	\$ 1.89	Price in Ethiopia not available, the price is from Leroy merlin DIY shop in South Africa https://leroymerlin.co.za/spray-gun-5-jets-1px-81444326
Total			\$ 5.07	
Optional: floor lined with terrazzo tiles	1	350	\$ 9.46	https://con.2merkato.com/prices/material/8/125

Pressure dispenser costs 20 US\$ for only 5 litres <https://www.game.co.za/game-za/en/All-Game-Categories/Home-%26-Garden/Garden-Care/Insecticides/Insecticides-%26-Sprayers/Garden-Master-SL-Pressurised-Spray-Bottle-With-Pump-SL-WITH-PUMP/p/499749-EA>

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Stainless steel plate , 0,3 mm thick , for the litter box	1.4		\$ 4.20	3 US\$/kg https://www.steelplates.in/suppliers/eritrea/stainless-steel-sheets-plates-in-ethiopia/
Portland cement (kg)	1	4	\$ 0.11	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Hollow concrete block 400x200x200	2	15.6	\$ 0.84	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
HDPE pipe 1/2" for the urine (m)	2	7	\$ 0.38	https://akerabi.com.et/product/hdpe-pipe-1-2/
Galvanized steel screws for wood , 40 mm, M4.8 (kg)	0.1	100	\$ 0.27	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanized steel angle brackets 50 x 50 x 38 x 1,8 (pcs.) - Support for the lever hinges for the litter box and flap door (pcs)	2	25	\$ 1.35	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.delletai6.5.6f464e37EdWgVM
Flat mending plates, galvanized steel	2		\$ 0.60	https://con.2merkato.com/prices/material/7/601 . Assumed the same price of the angle brackets
Plastic funnel for collecting the urine	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/
3 m rope or steel wire and 2 pieces of plastic tube or bamboo for the holding handles and tipping litter box			\$ 0.50	lumpsum estimation
Total Material Cost, stainless steel box			\$ 10.29	

Box made with timber planks, enamelled with synthetic paint

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Portland cement (kg)	1	4	\$ 0.11	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Hollow concrete block 400x200x200	2	15.6	\$ 0.84	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
HDPE pipe 1/2" for the urine (m)	2	7	\$ 0.38	https://akerabi.com.et/product/hdpe-pipe-1-2/
Plastic funnel for collecting the urine	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/
Timber 2.5cmX20cmX400cm - Ethiopian Shashemene. One plank for the litter box and flapping door, and 1.6 m will still remain	1	300	\$ 8.11	https://con.2merkato.com/prices/material/5/357
Galvanized steel screws for wood , 40 mm, M4.8 (kg)	0.1	100	\$ 0.27	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanized steel angle brackets 50 x 50 x 38 x 1,8 (pcs.) - Support for the lever hinges for the litter box and flap door (pcs)	2	25	\$ 1.35	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.delletai6.5.6f464e37EdWgVM
Flat mending plates, galvanized steel	2		\$ 0.60	https://con.2merkato.com/prices/material/7/601 . Assumed the same price of the angle brackets
Lever for dumping the tipping litter box			\$ -	Assumed that a wooden stick can be collected anywhere, no need to purchase
Super synthetic enamel	1	165	\$ 4.46	https://con.2merkato.com/prices/material/10/896
3 m rope or steel wire and 2 pieces of plastic tube or bamboo for the holding handles			\$ 0.50	lumpsum estimation
Total Material Cost, painted timber box			\$ 18.16	

Plastic box

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Portland cement (kg)	1	4	\$ 0.11	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340

HOLLOW BLOCKS	
	Hollow Block 12" (200 X 300 X 400) Weight (kg) : 32
	Hollow Block 10" (200 X 250 X 400) Weight (kg) : 31
	Hollow Block 8" (200 X 200 X 400) Weight (kg) : 23
	Hollow Block 6" (200 X 150 X 400) Weight (kg) : 18
	Hollow Block 4" (200 X 100 X 400) Weight (kg) : 14

densità ds 2 kg/dm3 1,9 kg/dm3 aggregati leggeri, 2 kg/dm3 cls normale

Spessore p: 0.2 dm ipotesi

V 12.8 dm3

W 25.6 kg ipotesi corretta

				standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
Hollow concrete block 400x200x200	2	15.6	\$ 0.84	
HDPE pipe 1/2" for the urine (m)	2	7	\$ 0.38	https://akerabi.com.et/product/hdpe-pipe-1-2/
Plastic funnel for collecting the urine	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/
Rigid plastic box, approx 20x20x30. One end must be cut away to allow dumping on tipping	1		\$ 1.95	Prices in Ethiopia non available. Two examples of suitable articles available for online purchase in South Africa and from a Turkish producer https://www.game.co.za/game-za/en/All-Game-Categories/Home-%26-Garden/Storage-%26-Organising/Storage-Boxes/Clear-%26-Colour-Plastic-Totes/Big-Jim-4L-Storage-Box-Clear-STORAGE-BOX/p/729973-EA and https://www.eurometall.com.tr/en/opened-front-plastic-box-20x20x30-cm
Galvanised steel screws for wood , 40 mm, M4.8 (kg)	0.1	100	\$ 0.27	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanized steel angle brackets 50 x 50 x 38 x 1,8 (pcs) - Support for the lever	2		\$ 0.60	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.dellatai6.5.6f464e37EdWgVM
hinges for the litter box and flap door (pcs)	2	25	\$ 1.35	https://con.2merkato.com/prices/material/7/601
Flat mending plates, galvanized steel	2		\$ 0.60	Assumed the same price of the angle brackets
Lever for dumping the tipping litter box			\$ -	Assumed that a wooden stick can be collected anywhere, no need to purchase
3 m rope or steel wire and 2 pieces of plastic tube or bamboo for the holding handles			\$ 0.50	lumpsum estimation
Total Material Cost, rigid plastic box with one end cut away			\$ 7.54	

Plastic jerrycan 10 l, side and top cut away

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Portland cement (kg)	1	4	\$ 0.11	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Hollow concrete block 400x200x200	2	15.6	\$ 0.84	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
HDPE pipe 1/2" for the urine (m)	2	7	\$ 0.38	https://akerabi.com.et/product/hdpe-pipe-1-2/
Plastic funnel for collecting the urine	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/
Plastic jerrycan, 10 l, one side ad top cut away	1	7000 UGX	\$ 1.89	https://www.jumia.ug/other-10l-plastic-water-jerrycan-green-6696937.html
Galvanised steel screws for wood , 40 mm, M4.8 (kg)	0.1	100	\$ 0.27	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanized steel angle brackets 50 x 50 x 38 x 1,8 (pcs) - Support for the lever	2		\$ 0.60	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.dellatai6.5.6f464e37EdWgVM
hinges for the litter box and flap door (pcs)	2	25	\$ 1.35	https://con.2merkato.com/prices/material/7/601
Flat mending plates, galvanized steel	2		\$ 0.60	Assumed the same price of the angle brackets
Lever for dumping the tipping litter box			\$ -	Assumed that a wooden stick can be collected anywhere, no need to purchase
3 m rope or steel wire and 2 pieces of plastic tube or bamboo for the holding handles			\$ 0.50	lumpsum estimation
Total Material Cost, 10 l plastic jerrycan with one end cut away			\$ 7.48	

Box made with fibre-cement, plastered with thin mortar

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Portland cement (kg)	1.5	4	\$ 0.16	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340

Hollow concrete block 400x200x200	2	15.6	\$ 0.84	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
HDPE pipe 1/2" for the urine (m)	2	7	\$ 0.38	https://akerabi.com.et/product/hdpe-pipe-1-2/
Plastic funnel for collecting the urine	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/ The quantity is so small that a lumpsum in excess was
Lime and sand for mortar			\$ 0.50	arbitrarily defined
Galvanised steel screws for wood , 40 mm, M4.8 (kg)	0.1	100	\$ 0.27	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanized steel angle brackets 50 x 50 x 38 x 1,8 (pcs.) - Support for the lever	2		\$ 0.60	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.dellatai6.5.6f464e37EdWgVM
hinges for the litter box and flap door (pcs)	2	25	\$ 1.35	https://con.2merkato.com/prices/material/7/601
Flat mending plates, galvanized steel	2		\$ 0.60	Assumed the same price of the angle brackets
Lever for dumping the tipping litter box			\$ -	Assumed that a wooden stick can be collected anywhere, no need to purchase
Super synthetic enamel	1	165	\$ 4.46	https://con.2merkato.com/prices/material/10/896
3 m rope or steel wire and 2 pieces of plastic tube or bamboo for the holding handles			\$ 0.50	lumpsum estimation
Total Material Cost, fibre-cement box			\$ 10.60	

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Steel sheet, 0,25 mm thick	0.24	269	\$ 1.74	Metal Sheet - G32 CIS - 0.25mm Thickness, price per m2, https://con.2merkato.com/prices/material/7/777
Portland cement (kg)	1	4	\$ 0.11	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Hollow concrete block 400x200x200	2	15.6	\$ 0.84	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
HDPE pipe 1/2" for the urine (m)	2	7	\$ 0.38	https://akerabi.com.et/product/hdpe-pipe-1-2/
Plastic funnel for collecting the urine	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/
Galvanised steel screws for wood , 40 mm, M4.8 (kg)	0.1	100	\$ 0.27	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanized steel angle brackets 50 x 50 x 38 x 1,8 (pcs.) - Support for the lever	2		\$ 0.60	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.dellatai6.5.6f464e37EdWgVM
hinges for the litter box and flap door (pcs)	2	25	\$ 1.35	https://con.2merkato.com/prices/material/7/601
Flat mending plates, galvanized steel	2		\$ 0.60	Assumed the same price of the angle brackets
3 m rope or steel wire and 2 pieces of plastic tube or bamboo for the holding handles and tipping litter box			\$ 0.50	lumpsum estimation
Total Material Cost, box made of steel sheet			\$ 7.84	

Total Material Cost, tipping litter box made w/ceramic tiles, plastic funnel for urine diversion, seat made with ceramic tiles			\$ 9.73
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Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Local pottery (estimated average price per piece)	3	5	\$ 0.41	https://core.ac.uk/download/pdf/39299702.pdf
Timber shelf 2.5cmX20cmX40cm - Ethiopian (Shashemene)	1	0	\$ -	the full cost from https://con.2merkato.com/prices/material/5/357 was already inputted to the tipping box construction, the shelf is a scrap of the same
Galvanised steel screws for wood , 40 mm, M4.8 (kg)	0.03	100	\$ 0.08	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Galvanised steel brackets for wood	2		\$ 0.60	Price in Ethiopia not available, assumed 0.3 US\$ extrapolating from here: https://www.alibaba.com/product-detail/metal-stamping-kit-steel-reinforced-corner_62002724778.html?spm=a2700.details.deileta6.5.6f464e37EdWgV
Super synthetic enamel	1	0	\$ -	https://con.2merkato.com/prices/material/10/896 . The cost was already inputted to the construction of the tipping box
Total Material Cost, clay bowl and jar placed on wooden shelf			\$ 1.09	

Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
5 litres plastic jerrycan cut in two	1		\$ 0.65	Price in Uganda https://www.jumia.ug/nice-jerrycan-5-litres-white-2462775.html
Intra venous infusion kit inserted into a hole in a suspended plastic bottle or elementary foot valve in the cap of a plastic bottle	1		\$ 0.09	Price in India 7 - 12 INR = 0,09 - 0,16 US\$ https://www.indiamart.com/proddetail/iv-infusion-set-16876255912.html
Plastic bottle	1			assumed as free, recycled bottle
Galvanised steel screws for wood , 40 mm, M4.8 (kg)	0.03	100	\$ 0.08	Price in Ethiopia not available, assumed the same price per kg as nails https://con.2merkato.com/prices/material/6/102
Total Material Cost, one plastic jerrycan			\$ 0.82	

plastic syphon pump	1		\$ 1.66	Price in South Africa https://www.superbuy.co.za/syphon-pump-manual-54cm.h
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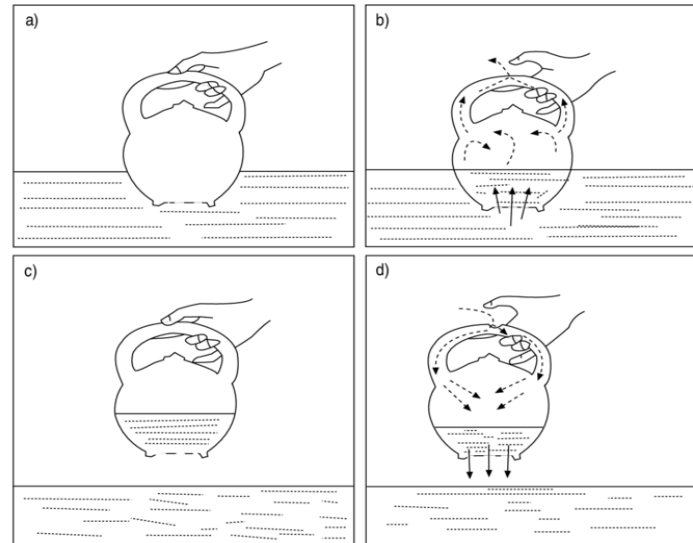
Material	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
plastic bottle	1	0	\$ -	Price in Uganda https://www.jumia.ug/nice-jerrycan-5-litres-white-2462775.html
Foot-valve assembly of 10 mmx 50 mm bolt, 2 nuts, washer, O-ring	1		\$ 0.10	Lumpsum assumption
concrete block	3	15.6	\$ 1.26	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
synthetic enamel and Portland cement	as needed		\$ -	null, because already inputted to the construction of the tipping box and/or superstructure
Total Material Cost, concrete blocks + bottle with foot valve			\$ 1.26	

Plastic handwashing stations Benin / Ethiopia / Ivory Coast	https://www.psi.org/ . cambio al 12/11/2020 1 CFA = 0,0018 US\$		
Bucket (approx. 10 L)	1	500	500 \$0.90
Plastic Faucet	1	1500	1500 \$2.70
Coupling	1	500	500 \$0.90
Threaded Sleeve	1	500	500 \$0.90
Plastic Funnel	1	800	800 \$1.44
Bracket	2	500	1000 \$1.80
Screws	4	50	200 \$0.36
Elbow Pipe	1	500	500 \$0.90
Labor	1	1000	1000 \$1.80



Carl Sagan's reconstruction of water thief <http://kiwihellenist.blogspot.com/2018/11/cosmos-2-ionians-and-others.html>

Empedocles klepsydra https://www.researchgate.net/figure/The-clepsydra-of-Empedocles-The-first-model-used-to-explain-the-mechanics-of_fig1_15486394



Total Price	6500 CFA / 12 US
In Ethiopia total cost 5US\$ https://www.psi.org/2020/06/covid19-ethiopia-supply-chain/	

Material for anal washing/shower slab	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Portland cement (kg)	1	4	\$ 0.11	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Hollow concrete block 400x200x200	3	15.6	\$ 1.26	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21025537.html ; Price from https://con.2merkato.com/prices/material/4/59
Flexible plastic tube for the grey water (m)	2	20	\$ 1.08	https://con.2merkato.com/prices/material/11/175
Plastic funnel = sink for the grey water	1	800 CFA	\$ 1.44	Price in Ethiopia not available, reference from Benin https://www.psi.org/2020/06/covid19-handwashing-stations/
Total			\$ 3.89	

Material wedge shaped solar box	Qty. Required	Unit Cost	Cost (US\$)	Source and remarks
Vegetal fibres (kg)	21.45	0	\$ -	65% of the panel's weight, density of the panel 10 - 11 kg/m ² , 3 m ² necessary
Portland cement (panels plus plastering, kg)	15.2	4	\$ 1.64	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Spent lime for waterproof mortar (kg)	0.5	3	\$ 0.04	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	2.5	0.7	\$ 0.05	https://con.2merkato.com/prices/material/2/21
charcoal for blackening the walls and bottom		\$ -		waste from cooking or charred agricultural residues
Cardboard or straw (as additional insulation)		\$ -		assumed free of recycled
Rigid PVC ventilation pipe diam. 50 mm , 3 m pc.	1	85	\$ 2.30	https://constructioninethiopia.com/construction-materials-in-ethiopia/
galvanized steel wire for securing the pipe	0.2	34	\$ 0.18	price per kg https://constructioninethiopia.com/construction-materials-in-ethiopia/
wooden frame, Batters - 40X50mmX4m - Austria	2	60	\$ 3.24	https://con.2merkato.com/prices/material/5/73
Greenhouse PE film (Only 2 m2 needed, but rolls are 2 m x 10 m)	0.5		\$ 6.50	Price in Sud Africa DIY shop https://leroymerlin.co.za/growing-film-nortene-2m5m-perforated-plastic-81419937
Total			\$ 13.96	

Material flat solar box, insulation with 30 cm straw	Qty. Required	Unit Cost	Cost (US\$)	Source and remarks
Vegetal fibres (kg)	10.725	0	\$ -	65% of the panel's weight, density of the panel 10 - 11 kg/m ² , 3 m ² necessary
Portland cement (panels plus plastering, kg)	7.6	4	\$ 0.82	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Spent lime for waterproof mortar (kg)	0.2	3	\$ 0.02	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	1.5	0.7	\$ 0.03	https://con.2merkato.com/prices/material/2/21
charcoal for blackening the walls and bottom		\$ -		waste from cooking or charred agricultural residues
straw insulation = 30 cm minimum		\$ -		assumed free of recycled
Rigid PVC ventilation pipe diam. 50 mm , 3 m pc.	1	85	\$ 2.30	https://constructioninethiopia.com/construction-materials-in-ethiopia/
galvanized steel wire for securing the pipe	0.2	34	\$ 0.18	price per kg https://constructioninethiopia.com/construction-materials-in-ethiopia/
wooden frame, Batters - 40X50mmX4m - Austria	1	60	\$ 1.62	https://con.2merkato.com/prices/material/5/73
Bubble PE foil, 60 cm x 5 m	1	4.50 €	5.4	https://www.mwmaterials.com/en/materials/polyethylene-polypropylene-and-cellulose/polyethylene-bubble-wrap/polyethylene-packaging-bubble-wrap.html thermal loss U = 4.5 W/m2.K from https://walferx.blogspot.com/2017/12/physics-quiz-question-thermal.html?m=0
Total			\$ 10.37	

Material , solar concentrator box	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Steel sheet, blackened with smoke, 0.25 mm thick	0.7	269	\$ 5.09	Metal Sheet - G32 CIS - 0.25mm Thickness, price per m ² , https://con.2merkato.com/prices/material/7/777
Insulation (straw, bark , cardboard bits, or any loose material)				assumed free
Glass window, 50x 50 cm, 3 mm thick	0.25	180	\$ 1.22	https://constructioninethiopia.com/construction-materials-in-ethiopia/ , U = 7.9 W/m ² °C for single pane glass, horizontal, https://www.engineeringtoolbox.com/heat-loss-transmission-d_748.html .
Aluminium foil Roll 0.3 x 20 m = 6 m ²	3 m ²	1242 Nigerian Naira	\$ 1.61	https://www.jumia.com.ng/generic-food-grade-kitchen-barbecue-aluminum-foil-rolls-household-baking-disposable-foil-packaging-length-5m-10m-20meters-width-30cm-thickness-20-microns-66400528.html
Cardboard to support Al foil concentrator and to build the solar box				assumed free, recycled box
Total			\$ 7.92	

Material cost, 45° trapezoidal section trench, cement-fibre cover	Qty. Required	Unit Cost	Cost (US\$)	Source and remarks
Trench (1.2 m upper width, 0.56 m bottom width, 0.56 m depth x 4.2 m long = 2 m ³)				only labour, no lining because the 45° slope is stable enough in most soil types
Portland cement (3 covers 1.4x1.4m x 40 mm + waterproof mortar)	36.2	4	\$ 3.91	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
vegetal fibres for the panels (kg)				assumed free
Spent lime for waterproof mortar (kg)	0.2	3	\$ 0.02	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	1.5	0.7	\$ 0.03	https://con.2merkato.com/prices/material/2/21
Total			\$ 3.96	

Vent pipe (PVC tube 50 mm x 2 m piece)	1	120	\$ 3.24	https://con.2merkato.com/prices/material/12/248
ALTERNATIVE : BUILDING Vent Pipe (square section, 3 panels 100 mm x	2.64	4	\$ 0.29	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340

Material cost, pervious cement box 2m x 1 m x 1 m, 5 cm thick, cover fibre-cement panel	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Vegetal fibres (kg)	7.15	0	\$ -	65% of the panel's weight, density of the panel 10 - 11 kg/m ² , 3 m ² necessary

T	0.7	2xPE film	Uf	3.85	2x PE film
a	0.8	Ub (W/m2)	0.535045	0.535045	fibres panel 20 mm , carboard 50 mm, fibres panel 20 mm
G	6	A	0.924172	0.924172	m2
G T a	3.36	width	0.6	0.6	m
Tin-Tout	60 °C	L	1.540286	1.540286	m
T	0.7	2xPE film	Uf	3.85	2x PE film
a	0.8	Ub (W/m2)	0.797546	0.797546	fibres panel 20 mm , straw 100 mm, fibres panel 20 mm
G	6	A	1.027296	1.027296	m2
G T a	3.36	width	0.6	0.6	m
Tin-Tout	60 °C	L	1.71216	1.71216	m
T	0.7	2xPE film	Uf	3.85	2x PE film
a	0.8	Ub (W/m2)	0.174966	0.174966	fibres panel 20 mm , straw 300 mm, fibres panel 20 mm
G	6	A	0.812316	0.812316	m2
G T a	3.36	width	0.6	0.6	m
Tin-Tout	60 °C	L	1.35386	1.35386	m
panels for the box, inner size 1,36 x 0,6	1	0.816			
1,36 x 0,2	2	0.528			
0,6 x 0,2	2	0.144			
					1.488

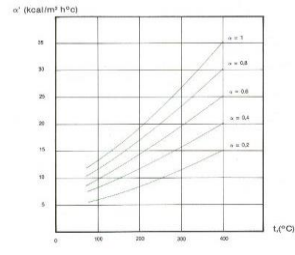


Fig. 3.5 -- Coefficiente α' di dispersione termica globale, per irraggiamento e convezione naturale in aria, in funzione della temperatura della parete e della sua emissività [57]. Per ottenere α' in KWh/m²h, moltiplicare per 1,163.

Thermal dispersion at 80°C, black walls = 13 Kcal/m².h.°C

Thermal dispersion at 80°C, fibre panel painted with lime = 6 Kcal/m².h.°C

Required Total Input power #REF! kW

Average solar radiation 6 kWh/m².day

Avg. Solar power 0.75 kW/m²

Reflection coeff. Al. Foil 0.86

Absorbance black concrete 0.9

net absorbed power 0.5805 kW/m²

Entry area of reflector #REF! m² semicircle #REF! m

Area of Al foil (half cone tru #REF! m²

Portland cement (cover panels plus plastering, kg)	9.8	4	\$ 1.06	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Spent lime for waterproof mortar (kg)	0.2	3	\$ 0.02	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	1.5	0.7	\$ 0.03	https://con.2merkato.com/prices/material/2/21
Portland cement for pervious concrete 1300 kg/m3.(kg)	104	4	\$ 11.24	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Gravel 4 - 19 mm (m3)	0.4	600	\$ 6.49	https://con.2merkato.com/prices/material/2/23
Rigid PVC ventilation pipe diam. 50 mm , 3 m pc.	1	85	\$ 2.30	https://constructionethiopia.com/construction-materials-in-ethiopia/
Total			\$ 21.13	

Material cost, jumbo bags, cover with fibre-cement panel	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Vegetal fibres (kg)	7.15	0	\$ -	55% of the panel's weight, density of the panel 10 - 11 kg/m2, 3 m2 necessary
Portland cement (cover panels plus plastering, kg)	9.8	4	\$ 1.06	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Spent lime for waterproof mortar (kg)	0.2	3	\$ 0.02	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	1.5	0.7	\$ 0.03	https://con.2merkato.com/prices/material/2/21
Second hand bulk bag South Africa	2	30 - 50 ZAR	\$ 3.25	https://www.gumtree.co.za/s-1-ton-bulk-bags/v1q0p1
Eucalyptus poles, 4 m long, 50 mm diameter	4	65	\$ 7.03	https://con.2merkato.com/prices/material/4/68
Total			\$ 11.38	

Material cost, V-shaped trench, cover with fibre-cement panel	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Vegetal fibres (kg)	57.2	0	\$ -	55% of the panel's weight, density of the panel 10 - 11 kg/m2, 8 m2 necessary
Portland cement (cover panels plus plastering, kg)	37.2	4	\$ 4.02	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Spent lime for waterproof mortar (kg)	0.5	3	\$ 0.04	Price in Ethiopia not available, assumed 75% of the price of Portland cement
Sand (for waterproof mortar, dm3)	3	0.7	\$ 0.06	https://con.2merkato.com/prices/material/2/21
biofilter (if necessary for odour control) , m ³ of material	2			Free because only reeds , twigs, wet straw or similar loose biomass is necessary. Watering to keep moist is required
Total			\$ 4.12	

Material cost, gasification stove	Qty. Required	Local Unit Cost (ETB)	Cost (US\$)	Source and remarks
Portland cement (kg)	0.5	4	\$ 0.05	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Hollow concrete block 400x200x100	12	10	\$ 3.24	standard sizes concrete blocks https://www.unikblockmachines.com/info/what-standard-sizes-of-hollow-concrete-block-21075537.html ; Price from https://con.2merkato.com/prices/material/4/59
sand	1	0.7	\$ 0.02	https://con.2merkato.com/prices/material/2/21
2.5 mm steel wire (support for the pot, optional)	0.2	34	\$ 0.18	price per kg https://constructionethiopia.com/construction-materials-in-ethiopia/
Total			\$ 3.50	

Miscellaneous costs

Ondulated polycarbonate sheet				https://roymerlin.co.za/polycarbonate-roof-sheet-corrugated-2-4m-clear-81423845
Ondulated PC, 0.8 x 2.4 m	1	270	\$ 14.62	https://con.2merkato.com/prices/material/9/159
clear glass, 1 m2 sheets			\$ 13.00	Price in Sud Africa DIY shop https://roymerlin.co.za/growing-film-nortene-2mx5m-perforated-plastic-81419937
Greenhouse PE film (Only 2 m2 needed, but rolls are 2 m x 10 m)				https://constructionethiopia.com/construction-materials-in-ethiopia/ , U = 7.9 W/m2°C for single pane glass, horizontal, https://www.engineeringtoolbox.com/heat-loss-transmission-d_748.html)
glass 3 mm thick, 1 m2 sheets	1	180	4.86	486/100
Bubble PE foil, 60 cm x 5 m	1	4.50 €	5.4	https://www.mwmaterialsworld.com/en/materials/polyethylene-polypropylene-and-cellophane/polyethylene-bubble-wrap/polyethylene-packaging-bubble-wrap.html . thermal loss U = 4.5 W/m2.K from https://walflex.blogspot.com/2017/12/physics-quiz-question-thermal.html#m2
Aluminium foil Roll 0.3 x 20 m	1	1242 Nijer	3.2292	https://www.jumia.com.ng/generic-food-grade-kitchen-barbecue-aluminum-foil-rolls-household-baking-disposable-foil-packaging-length-5m-10m-20meters-width-30cm-thickness-20-microns-66400528.html
Metal semicylinder, diam. 60 cm x h 40 cm (56 litres)	0.376992	269	\$ 2.74	Metal Sheet - G32 CIS - 0.25mm Thickness, price per m2, Data calculated from https://www.ethiopianimporter.com/ethiopia-import-data/canvas/hs-code-5309/entry-viet-nam.html
Canvas lining for the bottom (pit 3 m x 2 m x 1 m, 45° shape, canvas 12x9 m2)	4	4 US\$/kg	\$ 4.32	https://con.2merkato.com/prices/material/7/682
Steel Rectangular Hollow Section - 30X20X1.2 (price per m)	2	34.9	\$ 1.89	https://con.2merkato.com/prices/material/12/250
Vent pipe (PVC tube 110 mm x 2 m piece)	1	550	\$ 14.86	https://con.2merkato.com/prices/material/12/250
Jumbo bag 1 ton (India)	1	210 INR	\$ 2.73	https://www.indiamart.com/pricedetail/pp-jumbo-bag-19413041555.html
Second hand bulk bag South Africa	1	30 - 50 ZAR	\$ 3.25	https://www.gumtree.co.za/s-1-ton-bulk-bags/v1q0p1

				Data from https://www.gumtree.co.za/a-braais-potjie-pots/strand/half-braai-drums-for-sale/100822205620910165500409
Recycled steel drum	1	100 ZAR	5	6.50
50mm galvanized steel pipe (m)	1	500	5	13.51

Plastic jerrycan , 20 l	1	10,000 UGX	\$ 2.70	http://afrishop.biz/product/empty-plastic-jerrycan-20l/
Plastic jerrycan 20 l, discounted	1	7300 UGX	\$ 1.97	https://www.jumia.ug/nice-jerrycan-20-litre-yellow-89696.html
Plastic jerrycan, 10 l	1	7000 UGX	\$ 1.89	https://www.jumia.ug/other-10l-plastic-water-jerrycan-green-6696937.html
Plastic jerrycan, 10 l	1	27 INR	\$ 0.38	
Plastic jerrycan 5 l	20	15 INR	\$ 4.20	https://www.indiamart.com/proddetail/white-5l-hdpe-jerry-can-21945972933.html

Portland cement (kg) necessary for making a box of fibre cement panels, 50 cm side, 2 cm thick	6.6	4	\$ 0.71	Price 400 ETB/quintal, https://con.2merkato.com/prices/material/2/18 . In Ethiopia 1 quintal = 100 kg because it was an Italian colony https://www.igi-global.com/dictionary/quintal/79340
Plastic jerrycan 20 l for transporting the urine to the farm	1	7300 UGX	\$ 1.97	Price in Ethiopia not available, https://www.jumia.ug/nice-jerrycan-20-litre-yellow-89696.html
plastic syphon pump to fill the jerrycan from the urine container	1		\$ 1.66	Price in South Africa https://www.superbuy.co.za/syphon-pump-manual-54cm.html
Total			\$ 4.34	https://www.indiamart.com/proddetail/plastic-jerry-cans-3735195948.html

garden water can, 14 l, plastic 1 6500 Nigerian Na \$ 16.90 <https://www.afrimash.com/shop/agricultural-equipment/outdoor-agricultural-equipment/farm-irrigation-equipment/watering-can-plastic-14-liters-capacity/>

Plastic jerrycans 20 l (collection, maturation and transport to the field)	5	7300 UGX	\$ 9.86	https://www.jumia.ug/nice-jerrycan-20-litre-yellow-89696.html
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Plastic bags with punched holes filled with sand				
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Plastic jerrycan 5 l, punched holes, buried	20	15 INR	\$ 4.20	https://www.indiamart.com/proddetail/white-5l-hdpe-jerry-can-21945972933.html
Plastic jerrycan 10 l (collection and daily transport to the field)	1	27 INR	\$ 1.05	https://www.indiamart.com/proddetail/10-l-white-hdpe-jerry-can-21974082062.html?pos=10&kwd=10+litre+plastic+can&tags=A%7C%7C%7C%7C7C539.084%7CPrice%7Cproxy
Total			\$ 5.25	

Item	Cost	% of total cost
Basic superstructure	\$ 17.14	52%
Squatting pod with tipping box made of steel plate and and urine diverting plastic funnel	\$ 7.84	24%
Material cost, 45° trapezoidal section trench , cement-fibre cover , raking required from time to time	\$ 3.96	12%
Urine storage (125 l tank 50x50x50 cm, self-built with cement-fibre panels and water-tight mortar + syphon pump to avoid contact with the liquid + jerrycan to spread the urine in the farm, emptying once a week)	\$ 4.34	13%
Basic handwashing station ("tippy tap" placed outside of the toilet , usual practice in Africa according to the literature, null cost because made with a recycled PET bottle hanging from a hook or nail).	\$ -	0%
TOTAL (basic compliance with EN 16194 and with the Challenge's specifications)	\$ 33.28	
Saving (-) or excess (+) against target cost 45 US\$	\$ -11.72	
Optional functions not required by the Challenge/EU norm but providing more comfort , hygiene and durability	Additional cost	% of basic configuration
Water tank for rain harvest integrated in roof (approx 70 l)	\$ 5.07	15%
Guys and stakes bracing to resist Cat. 1 hurricanes	\$ 4.65	14%
Anal washing / shower pan	\$ 3.89	12%
Hands washing basin with vanes for toilet items (3 concrete blocks to form the basin and vanes, 1 bottle with foot valve or flexible tube from the roof water tank)	\$ 1.26	4%
Gasification stove	\$ 3.50	11%
Solar dehydrator (box oven)	\$ 7.92	24%
Floor lined with ceramic tiles	\$ 9.46	28%
Total, with all optional features (-basic handwashing station)	\$ 35.76	107%

Item	Cost	% of total cost
Basic superstructure	\$ 17.14	52%
Sitting bowl with tipping box and seat made of 20x20 ceramic tiles and and urine diverting plastic funnel	\$ 9.73	29%
Material cost, 45° trapezoidal section trench , cement-fibre cover , raking required from time to time	\$ 3.96	12%
Urine storage (125 l tank 50x50x50 cm, self-built with cement-fibre panels and water-tight mortar + syphon pump to avoid contact with the liquid + jerrycan to spread the urine in the farm, emptying once a week)	\$ 4.34	13%
Basic handwashing station ("tippy tap" placed outside of the toilet , usual practice in Africa according to the literature, null cost because made with a recycled PET bottle hanging from a hook or nail).	\$ -	0%
TOTAL (basic compliance with EN 16194 and with the Challenge's specifications)	\$ 35.17	
Saving (-) or excess (+) against target cost 45 US\$	\$ -9.83	

\$

43.81