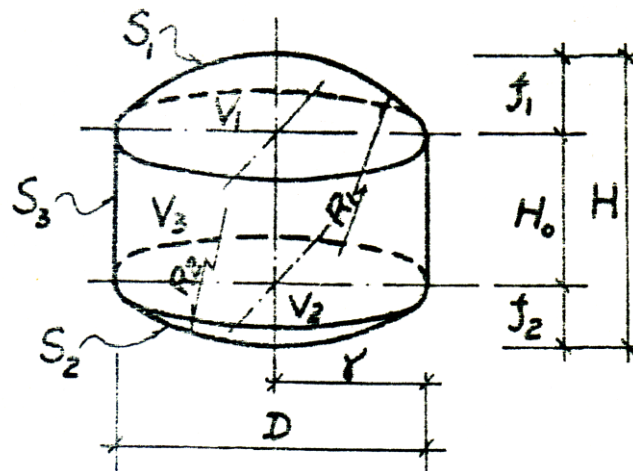


Biogas Chinese fixed dome unit calculation **Khartoum price**

| Biogas Unit calculations | | 10 m3 | | |
|---|------|---------------------------------------|------------------------|--------------------------------------|
| D=2.7, H=2.32, H'=1,22, F'=0.6, F''=0.5 | | | | |
| ITEMS | Unit | Cost of 1 unit volume excavated (SDG) | Total volume excavated | Cost of total volume excavated (SDG) |
| EXCAVATION | | | | |
| Digester excavation | m3 | 30 | 100 | 3000 |
| Out let excavation | m3 | 10 | 100 | 1000 |
| Back filling | m3 | 34 | 60 | 2040 |
| CONCRETE WORK | | | | |
| Digester sand leveling | m2 | 13.4 | 20 | 268 |
| // // bottom concrete | m3 | 1.2 | 1785 | 2142 |
| // // wall concrete | m3 | 1.3 | 1785 | 2320.5 |
| // // dome concrete | m3 | 1 | 1785 | 1785 |
| Out let sand leveling | m2 | 7.1 | 20 | 142 |
| // // bottom concrete | m3 | 0.7 | 1785 | 1249.5 |
| // // wall concrete | m3 | 1.13 | 1785 | 2017.05 |
| // // rove concrete | m3 | 0.75 | 1785 | 1338.75 |
| SEALING | | | | |
| DOFA SEALANT PAINT | m2 | 22.9 | 80 | 1832 |
| DOFA SAULT RESISTANT COTE | m2 | 19 | 20 | 380 |
| APPLIANCES | | | | |
| manhole cover + in out let & fittings | unit | 1 | 1350 | 1350 |
| gas burner room | // | 2 | 1000 | 2000 |
| In & out let dung and sludge collector | unit | 2 | 300 | 600 |
| Testing after feeding dung | | | | |
| & Operation | | 1 | 5000 | 5000 |
| TOTAL | | | | 28465 |



Chinese FIXED DOME, AL- FASHIR PRICE

| Biogas Unit calculations | | 10m3 | | |
|--|------|--------------------------------|------------------------|--------------------------------------|
| D=2.7 H=2.32 H'=1,22 F'=0.6 F''=0.5 | | | | |
| ITEMS | Unit | Cost of 1 unit excavated (SDG) | Total volume excavated | Cost of total volume excavated (SDG) |
| EXCAVATION | | | | |
| Digester excavation | m3 | 30 | 130 | 3900 |
| Out let excavation | m3 | 10 | 130 | 1300 |
| Back filling | m3 | 34 | 75 | 2550 |
| CONCRETE WORK | | | | |
| Digester sand leveling | m2 | 13.4 | 20 | 268 |
| // // bottom concrete | m3 | 1.2 | 3417 | 4100.4 |
| // // wall concrete | m3 | 1.3 | 3417 | 4442.1 |
| // // dome concrete | m3 | 1 | 3417 | 3417 |
| Out let sand leveling | m2 | 7.1 | 20 | 142 |
| // // bottom concrete | m3 | 0.7 | 3417 | 2391.9 |
| // // wall concrete | m3 | 1.13 | 3417 | 3861.21 |
| // // rove concrete | m3 | 0.75 | 3700 | 2775 |
| SEALING | | | | |
| Dofa Sealant Paint | m2 | 41.1 | 120 | 4932 |
| Dofa Sault Resistant Cote | m2 | 41.1 | 30 | 1233 |
| APPLIANCES | | | | |
| manhole cover + in out let & fittings | unit | 1 | 3000 | 3000 |
| gas burner room | // | 2 | 1750 | 3500 |
| In & out let dung and sludge collector | unit | 2 | 300 | 600 |
| Testing after feeding dung & Operation | // | 1 | 10000 | 10000 |
| TOTAL | | | | 52413 |
| Transportation from Khartoum to Fashir and Accommodation at Fashir | | | | 40000 |
| TOTAL COST | | | | 92413* |

*It should be noted that the total cost DOES NOT INCLUDE TRANSPORTATION cost of our frame

THIS would facilitate the modified Pusin in installation of the rest of biogas units at Fashir

Using PUXIN frame modified to be used for the fixed Chinese dome

| | | | | |
|--|-------------|--|-------------------------------|---|
| Biogas Unit calculations | 10 m3 | | | |
| AL- FASHIR PRICE | | | | |
| D=2.7 H=2.32 H'=1,22 F'=0.6 F''=0.5 | | | | |
| ITEMS | Unit | Cost of 1 unit volume excavated (SDG) | Total volume excavated | Cost of total volume excavated (SDG) |
| <u>EXCAVATION</u> | | | | |
| Digester excavation | m3 | 18 | 130 | 2340 |
| Out let excavation | m3 | 15 | 130 | 1950 |
| Back filling | m3 | 10 | 75 | 750 |
| <u>CONCRETE WORK</u> | | | | |
| Digester sand leveling | m2 | 13.4 | 20 | 268 |
| // // bottom concrete | m3 | 1.2 | 3247 | 3896.4 |
| // // wall concrete | m3 | 2.2 | 3247 | 7143.4 |
| // // dome concrete | m3 | 1.2 | 3247 | 3896.4 |
| Out let sand leveling | m2 | 7.1 | 20 | 142 |
| // // bottom concrete | m3 | 1.14 | 3247 | 3701.58 |
| // // wall concrete | m3 | 1.9 | 3247 | 6169.3 |
| // // rove concrete | m3 | 0.63 | 3700 | 2331 |
| <u>SEALING</u> | | | | |
| DOFA SEALANT PAINT | m2 | 43 | 120 | 5160 |
| DOFA SAULT RESISTANT COTE | m2 | 43 | 30 | 1290 |
| <u>APPLIANCES</u> | | | | |
| manhole cover + in out let & fittings | unit | 1 | 3000 | 3000 |
| gas burner room | // | 2 | 1750 | 3500 |
| In & out let dung and sludge collector | unit | 2 | 300 | 600 |
| Testing after feeding dung & Operation | // | 1 | 10000 | 10000 |
| TOTAL | | | | 56138 |
| Transportation from Khartoum to Fashir and Accommodation at Fashir | | | | 40000 |
| TOTAL COST | | | | 96138 |

The modified fixed dome is suggested to spare cost of transportation of our frame from Khartoum to Fashir

COST BREAKDOWN FOR ONE CUBIC METER OF CONCRETE, comparison between Khartoum and Fashir

| AGREGATE : SAND : CEMENT : SIKA = 4 : 2 : 1 : 0.5KG | | | |
|---|-------------|-----|-------------|
| | Khartoum | | Fashir |
| CEMENT | 320 | | 500 |
| AGREGATE | 200 | | 300 |
| SAND | 100 | | 100 |
| SIKA | 100 | | 180 |
| WATER | 20 | | 20 |
| AGITATER | 50 | | 50 |
| MOULD | 140 | | 40 |
| | 930 | | 1190 |
| WORKER | 260 | | 720 |
| | | | |
| 1.5 | 1190 | | 1910 |
| 1.7 | 1785 | | 3247 |
| | | | |
| worker/day | 100 | 175 | 200 |
| Accommodation | 0 | | 175 |
| COST | 100 | | 375 |

Alsonosy Biogas Unit maintenance and operation

| | Unit | Quantity | cost |
|--|------|----------|---------------|
| Cleaning | | | 3000 |
| Removal of sealant paint | | | 1500 |
| A new up layer bottom concrete (7 cm) | | | 1500 |
| Application of sealant paint | m2 | 32 | 120 |
| Testing after feeding dung & Operation | | | 5000 |
| Total Cost | | | 14840 |
| Unforeseen expenses (15%) | | | 3156 |
| Total cost | | | 17,996 |

Training

Atts will carry out training for people who will be held responsible for operation the biogas units. This could be done for two days after biogas operation and can later make monitoring for three months with frequent visits every two weeks if you request. The cost is 1,000 for each day excluding travel and accommodation. We can add these costs later as soon as we get the real cost.