Cost Effective Ecological Sanitation Toilets(ECOSAN)

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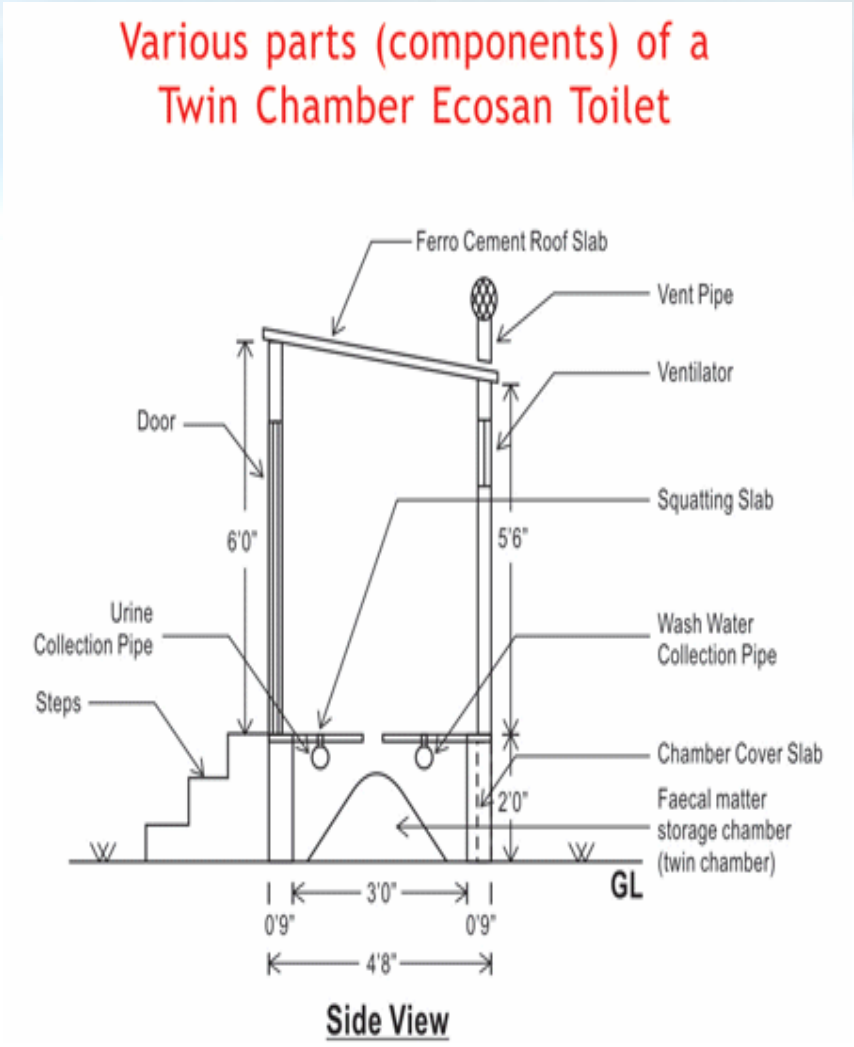
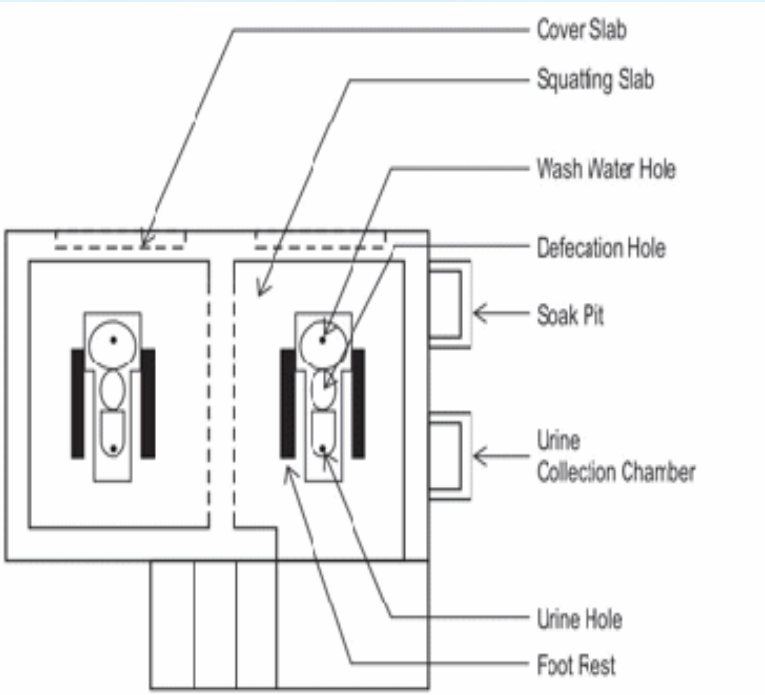
Up scaling of ECOSAN

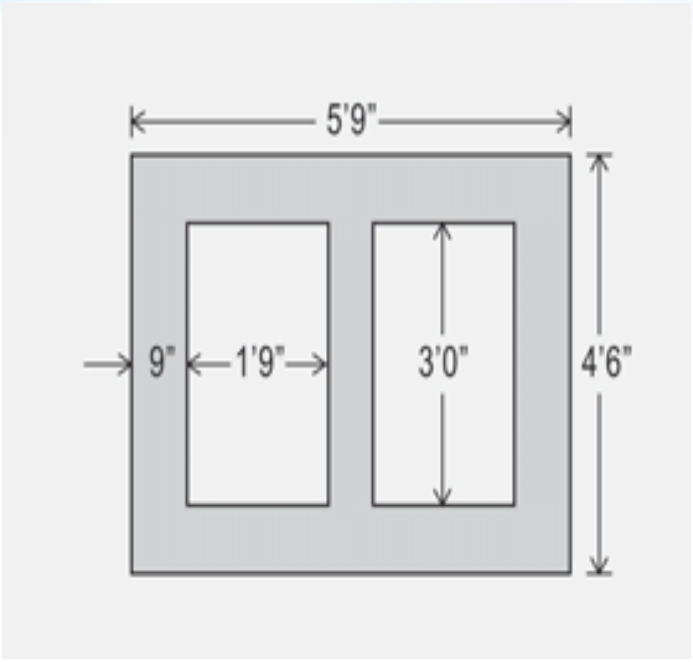
High Cost is one of the major Hindrance

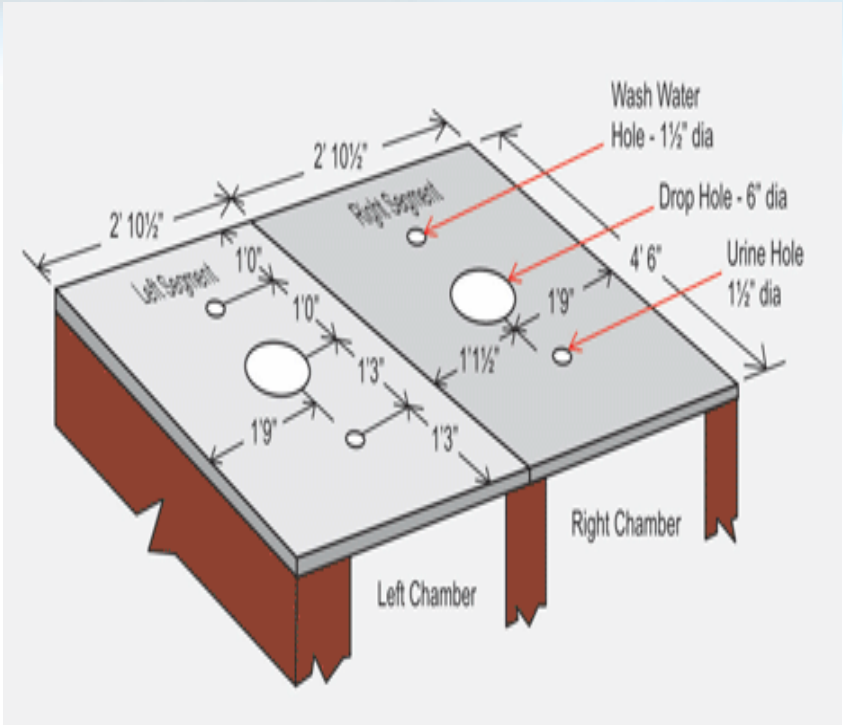
Cost Effective House Hold ECOSAN Design





Dimensions





Outer Size : Length 5.9

X 4.6

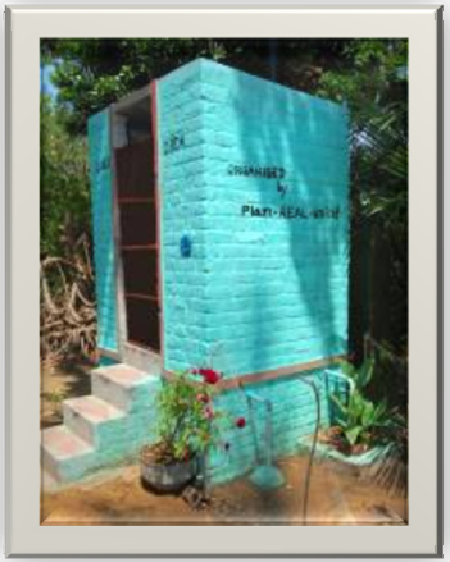
Inner Chamber Size : 1.9

X 3

Construction of ECOSAN Toilet





ECOSAN with Mud Block Super Structure with Plastering

Sno	Items	Units	Rate in Rs.	Amount
1	**Earth work excavation ***	**1**	**80.00**	**80.00**
2	**Boulders ***	**40**	**2.00**	**80.00**
3	Bricks	433	2.85	1234.00
4	Mud Block Stone	190 Nos	8.00	1520.00
5	Cement	3 Bags	235.00	705.00
6	Sand 2 bullock cart	1 .5	400.00	600.00
7	Slab cost(squatting ,roof, detachable)	6 Nos		1400.00
8	Door cost 5' X 2'.6''	1		300.00
9	PVC Pipes Materials			350.00
10	Mason wages – man days	5	250.00	1250.00
11	**Unskilled labours- man days ***	**4**	**80.00**	**320.00**
12	Material Transportation			100.00
	Total			**7939.00**

Total Cost : Rs.7939

Beneficiary Contribution : Rs.480

Double Chamber Bricks Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	Earth work excavation *	1	80	80.00
2	Boulders *	40	2.00	80.00
3	Bricks	850	2.85	2635.00
4	Cement	3	235	705.00
5	Sand	50 cft	8.00	400.00
6	Slab cost(squatting ,roof ,detachable)	6 Nos		1400.00
7	Door cost 5' X 2'.6''	1	300.00	300.00
8	PVC pipe Material			350.00
9	Mason wages-man days	4	250	1000.00
10	Unskilled labours- man days *	4	80	320.00
11	Material Transportation			100.00
	Total			**7370.00**

*** Denotes the items contributed by the beneficiaries (Total value R s. 480.00)**

Total Cost : **Rs. 7370** Beneficiary Contribution **:Rs. 480**

ECOSAN with Mud Block Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	**Earth work excavation ***	**1**	**80.00**	**80.00**
2	**Boulders ***	**40**	**2.00**	**80.00**
3	Bricks	433	2.85	1234.00
4	Mud Block Stone	190 Nos	8.00	1520.00
5	Cement	2 Bags	235.00	470.00
6	Sand 2 bullock cart	1	400.00	400.00
7	Slab cost(squatting ,roof, detachable)	6 Nos		1400.00
8	Door cost 5' X 2'.6''	1		300.00
9	PVC Pipes Materials			350.00
10	Mason wages – man days	4	250.00	1000.00
11	**Unskilled labours- man days ***	**3**	**80.00**	**240.00**
12	Material Transportation			100.00
	Total			**7174.00**

Total Cost : Rs.7174
Beneficiary Contribution : Rs.400

Cement Stone Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	**Earth work excavation ***	**1**		**80.00**
2	**Boulders Stone ***	**200**	**2.00**	**400.00**
3	Cement Stone	190 Nos	10.00	1900.00
4	Cement	3 Bags	235.00	705.00
5	Sand 1 bullock cart	1	400.00	400.00
6	Slab cost(squatting ,roof ,detachable)	6 Nos		1400.00
7	Door cost 5' X 2'.6''	1		370.00
8	PVC Pipe Materials			350.00
9	Mason Wages – man days	4 Nos.	250.00	1000.00
10	**Unskilled labours- man days ***	**4 Nos**	**80.00**	**320.00**
11	Material Transportation			100.00
	Total			**7025.00**

Total Cost : Rs.7025 Beneficiary Contribution : Rs. 800

Tin sheet super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	**Expense up to squatting level for Bricks masonry structure**			**3866.00**
2	Tin Sheet	120 feet	10	1200.00
3	Bamboo and Accessories			222.00
4	Reaper	120 feet	2	240.00
5	Wage for Technician making temporary super structure	2	250.00	500.00
6	Door cost 5' X 2'.6''	1		300.00
7	Material Transportation			50.00
	Total			**6378.00**

Total Cost : Rs.5823
Beneficiary Contribution : Rs.400

COST EFFECTIVE MODELS OF ECOSAN

ECOSAN with Hollow Blocks Super structure

Sno	Items	Units	Details Rs.	Amount
1	Earth work excavation *	1	80.00	80.00
2	Boulders *	40	2.00	80.00
3	Hollow block stone 4''	175	9.50	1662.50
4	Cement	2.5 Bags	235	587.50
5	Sand	50 cft	8 .00	400.00
6	Slab cost(squatting ,roof, detachable)	6 Nos		1400.00
7	Door cost 5' X 2'.6''	1	300	300.00
8	PVC Pipe Materials			350.00
9	Mason Wages - man days	4	250	1000.00
10	Unskilled labour-man days *	4	80	320.00
11	Material Transportation			100.00
	Total			**6279.50**

*** Denotes the items contributed by the beneficiaries (Total value R s. 480.00)**

Total Cost : **Rs. 6279** Beneficiary Contribution **Rs. 480**

Waste Wood Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	**Expense up to squatting level for Bricks masonry structure**			3866.00
2	Waste wood	110 Kg	5.00	550.00
3	Tin sheet	42 Feet		450.00
4	Bamboo and accessories		350.00	350.00
5	Door cost 5' X 2'.6''			300.00
6	Carpenter wages	2	250.00	500.00
7	Material Transportation			50.00
	Total			**6066.00**

Total Cost : Rs.6066. Beneficiary Contribution : Rs.320

Nanal Bamboo Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	**Expense up to squatting level for Bricks masonry structure**			**3866.00**
2	Nanal Thatch	16 Nos	50	900.00
3	Bamboos and accessories		327.00	327.00
4	Palm Leaf	50 Nos	1	50.00
5	Door cost 5' X 2'.6“	1		300.00
6	Wage for Technician making temporary super structure	1	250.00	250.00
7	Unskilled labours- man days *	1	80.00	80.00
8	Material Transportation			50.00
	Total			**5823.00**

Total Cost : Rs.5823

Beneficiary Contribution : Rs.400

Palm Leaf Super Structure

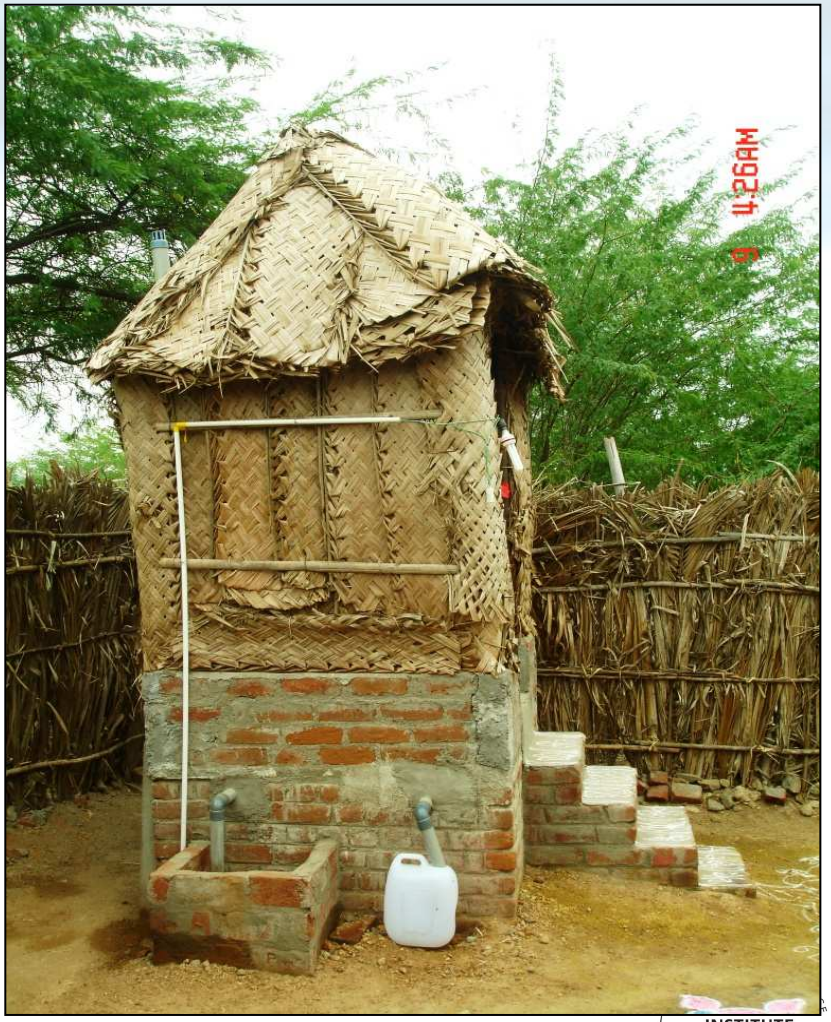
Sno	Items	Units	Rate in Rs.	Amount
1	**Expense up to squatting level for Bricks masonry structure**			**3866.00**
2	Palm Leaf	150 Nos	2.00	300.00
3	Bamboos and accessories		327.00	327.00
4	Door cost 5' X 2'.6''	1 Nos		300.00
5	Wage for Technician making temporary super structure	2	250.00	500.00
6	Unskilled labours- man days *	1	80.00	80.00
7	Material Transportation			50.00
	Total			**5423.00**

Total Cost : Rs.5423

Beneficiary Contribution : Rs.400

Coconut Thatches Super Structure

Sno	Items	Units	Rate in Rs.	Amount
	Expense up to squatting slab level			
1	**Earth work excavation ***	**1**	**80.00**	**80.00**
2	**Boulders ***	**40**	**2.00**	**80.00**
3	Bricks	425	2.85	1211.00
4	Cement	1 bag	235.00	235.00
5	Sand	25 cft	8.00	200.00
6	Slab cost(squatting ,detachable)	4 Nos	250.00	1000.00
7	PVC pipe Material			350.00
8	Mason wages-man days	2	250.00	500.00
9	**Unskilled labours- man days ***	**2**	**80.00**	**160.00**
10	Material Transportation			50.00
	Sub Total Up to Squatting Level			**3866.00**
	Expenses for super structure			
11	Coconut thatches and Bamboos Etc..	300	1.50	450.00
	Bamboos and accessories		327.00	327.00
12	Wage for Technician making temporary super structure	1	250.00	250.00
13	Door cost 5' X 2'.6"	1	300.00	300.00
14	**Unskilled labours- man days ***	**1**	**80.00**	**80.00**
15	Material Transportation			50.00
	Sub Total			**1457.00**
	Grand Total			**5323.00**



***** **Denotes the items contributed by the beneficiaries (Total value R s. 480.00)**

Total Cost : **Rs. 5323** Beneficiary Contribution **: Rs.480**

Single Chamber Bricks Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	Earth work excavation *	1	50.00	50.00
2	Boulders *	20	2.00	40.00
3	Bricks	350	2.85	998.00
4	Cement	2 Bags	235	470.00
5	Sand 1 bullock cart	1	400	400.00
6	Slab cost(squatting ,roof ,detachable)	3 Nos		650.00
7	Door cost 5' X 2'.6''	1		300.00
8	PVC Pipe Materials			175.00
9	Plastic drum	2 Nos	175	350.00
10	Mason wages – man days	2	250	500.00
11	Unskilled labours- man days *	2	80.00	160.00
12	Material Transportation			100.00
	Total			**4193.00**

Total Cost : Rs.4193 Beneficiary Contribution : Rs.250

Single Chamber Thatches Super Structure

Sno	Items	Units	Rate in Rs.	Amount
1	**Earth work excavation ***	**1**	**50.00**	**50.00**
2	**Boulders ***	**20**	**2.00**	**40.00**
3	Bricks	200	2.85	570.00
4	Cement	1 Bags	235.00	235.00
5	Sand 1 bullock cart	1/2	200.00	200.00
6	Slab cost(squatting ,detachable)	2 Nos		450.00
7	Door cost 5' X 2'.6''	1		300.00
8	PVC Pipe Materials			175.00
9	Plastic drum	2 Nos	175.00	350.00
10	Mason wages – man days	1	250.00	250.00
11	**Unskilled labours- man days ***	**2**	**80.00**	**160.00**
12	Coconut Thatches and bamboos and accessories			450.00
13	Wage for Technician making temporary super structure	1/2		125.00
14	Material Transportation			100.00
	Total			**3455.00**

Total Cost : Rs.3455 Beneficiary Contribution : Rs.250


Ecosan
Bamboo Model
constructed
byMegh Pyne
Abhiyan (Cloud
Water
Campaign),
Bihar.

Construction of Chamber and fixing of FRP Pan

Tin sheet Super structure Tiripura

Bamboo experimental model

Bamboo reinforcement

Two vaults with the access

LEARNINGS from our Experience

Super Structure :

- **ECOSAN with Hollow Block Super Structure seems to be Cost Effective at the same time "pakka" Structure with reasonable cost withe beneficiaries contributed Rs. 480/- and a subsidy of Rs. 2200/- obtained from TSC and only a sum of Rs.3599/- needed as out side support.**

- **Single chamber with temporary Super Structure can be the lowest cost of ECOSAN with a sum of Rs. 3455/-as construction expenditure . Beneficiary contribution is Rs. 300/- and the subsidy from TSC is Rs.2200/- and the rest Rs .955/- is needed as external support.**

- **Using Hollow Block instead of Bricks from the basement even upto squatting level can reduced a sum of Rs.500 in all the Models**

LEARNINGS from our Experience

Doors :

☞ **Tin Sheet with wooden reapers are used for the doors for all the ECOSAN Models. For the temporary Super Structure using the same material for the doors also can reduce another a sum of Rs.250/-.**

Chamber :

☞ **Changing the Brick wall between the chambers (Divider) from 9' to 4'.6'' can reduced a sum of Rs.150amount**

Squatting Pan : **Avoiding pans made of Ceramic or FRP and by using cement Mortar with hand finishing**

☞**can reduce a sum of Rs.600- Rs.1750 .**

LEARNINGS from our Experience

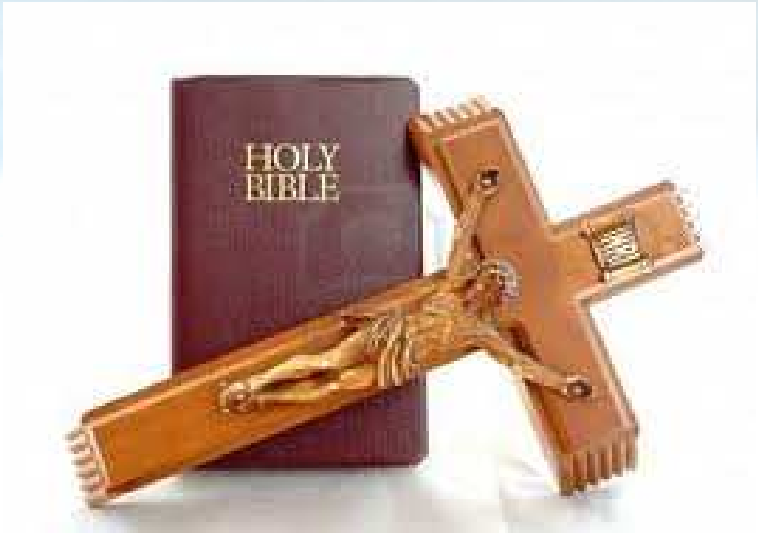
Detachable Slab :

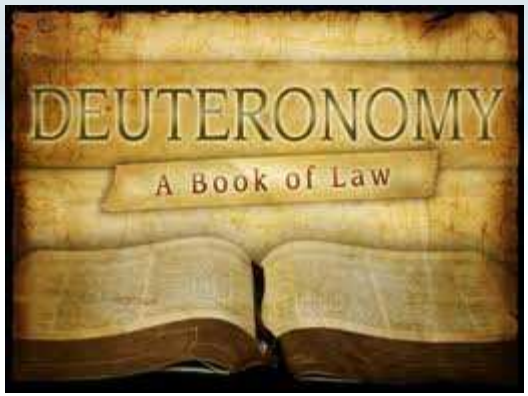
Avoiding detachable slabs behind the chamber but constructing with a hole and closing the hole with bricks and Mud Mortar can reduced the RCC cost.

Challenges and Recommendations

Challenges	Recommendations
Critical areas like coastal belt, drought prone and hilly area	Special Policy for the critical area to promote ECOSAN
Hesitation of the community to accept ECOSAN	Proper allocation for IEC and its implementation
High unit cost	Increase of subsidy for the promotion of ECOSAN
Lack of technical know -How	Popularization of ECOSAN technology, including Equipping the masons
Difficulty Experienced in - Motivating coastal fishermen compare to farming community	Pre and Post Project implementation , monitoring and supports need to be extended

Benefits of ECOSAN Compost and Urine





The book of Deuteronomy (23:11-15)

Out side the camp you shall have a place set aside to be used as a latrine.

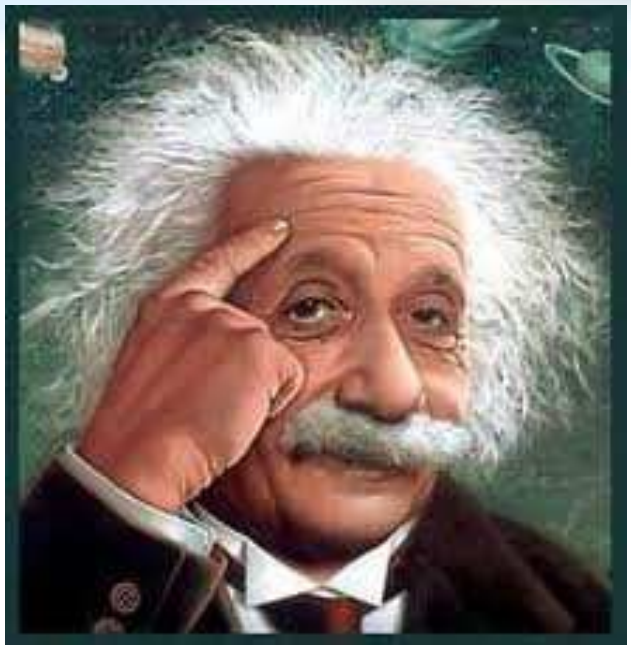
“ You Shall keep a trowel in your equipment and with it, When you go out side to ease nature, your shall first dig a hole and afterward cover up your excrement”

Mahatma Gandhi wrote in 1925

"The cause of many of our diseases is the condition of our lavatories and our bad habit of disposing of excreta anywhere and every where."

"Sanitation is more important than Independence"

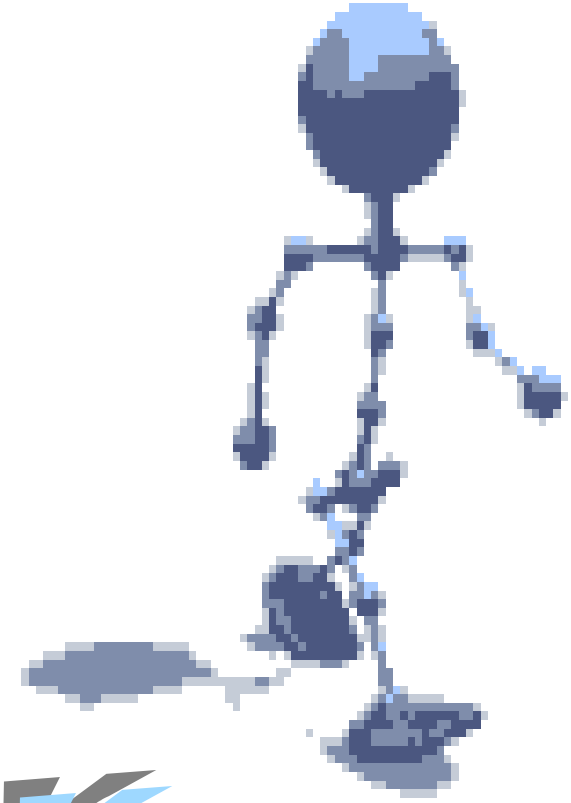
Changing Mindset



- Everything has changed except our way of thinking-

  --Albert Einstein


"Let us all take
that one extra step to
ensure that we live in
clean and healthy
surroundings"




THANK YOU