

Fig. 2 COEFFICIENTS OF CASH-FLOW FROM PURCHASES OF CONSTRUCTION INPUTS.  
(coeff1) Spatially, by Income Group and to the Local Government. (Per Rs. 100 of Expenditures)

OLD

5	-----								
	6   No.	DISTRIBUTION							
	7	External District				Within District		Local	
	8	4/		Urban		Rural		Income Group	
9	INPUTS Into:						Upper	Lower	Govt.
10	d	f	g	i	j	l	m	o	
11	-----								
12									
13	1.00 MATERIALS PRODUCTION								
14									
15	Water.	0.00	100.00	0.00	100.00	100.00	0.00	0.00	
16	Clay.	0.00	100.00	0.00	100.00	100.00	0.00	0.00	
17	Wood Fuel.	0.00	100.00	0.00	100.00	100.00	0.00	0.00	
18	Agricultural Waste	0.00	100.00	0.00	100.00	100.00	0.00	0.00	
19	Coal.	100.00	0.00	0.00	0.00	0.00	0.00	0.01	
20	Furnace Oil. 3/	80.00	20.00	20.00	0.00	18.00	2.00	1.14	
21									
22	Diesel/Electric Motors.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
23	Rotary Saw.	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
24									
25	2.00 CONSTRUCTION								
26									
27	Earth, Clay.	0.00	100.00	0.00	100.00	50.00	50.00	0.00	
28	Straw, Dung, Grass.	0.00	100.00	0.00	100.00	50.00	50.00	0.00	
29	Sand. 1/	0.00	100.00	71.00	29.00	76.67	23.33	6.67	
30	Aggregate. 1/	80.00	20.00	20.00	0.00	18.00	2.00	1.14	
31									
32	Bricks								
33	Sun-Baked. 2/	0.56	99.40	14.91	84.53	31.88	67.56	1.94	
34	Agri-Waste Fired. 2/	10.18	89.82	24.07	65.75	43.62	46.20	3.96	
35	Coal, Oil, Wood Fired 2/	56.67	41.05	7.43	35.88	12.98	28.07	0.80	
36			48.82			15.28			
37	Reed Mats. 2/	29.94	70.54	46.71	23.83	22.32	48.32	2.68	
38	Timber Beams, Battens. 2/6/	7.32	92.68	9.41	83.04	71.02	21.43	12.64	
39	Steel Girders, T Irons. 1/	96.49	3.51	3.51	0.00	3.32	0.19	0.13	
40	Mild Steel Rods. 1/	91.33	8.67	8.67	0.00	8.37	0.30	0.16	
41	Cement. 1/	93.62	6.38	6.21	0.18	5.78	0.60	0.50	
42	Bitumin. 7/	93.00	7.00	7.00	0.00	4.00	3.00	0.13	
43	Polythene. 7/	93.00	7.00	7.00	0.00	4.00	3.00	0.13	
44									
45	Hand Tools/Equipment								
46	Formwork								
47									
48	3.00 TRANSPORT (Trucks)								
49									
50	4.00 LABOUR								
51	Highly Skilled.	0.00	100.00	100.00	0.00	100.00	0.00	0.00	
52	Skilled.	0.00	100.00	50.00	50.00	0.00	100.00	0.00	
53	Unskilled.	0.00	100.00	0.00	100.00	0.00	100.00	0.00	
54									
55	5.00 BUILDING CONSTRUCTION								
56	Traditional (Indigenous) 2/	3.23	96.82	18.22	78.66	26.73	70.03	3.13	
57	Intermediate 2/								
58	Modern (Imported) 2/	50.67	49.33	26.27	23.07	17.23	32.10	1.21	
59									
60	-----								

61  
62  
63 1/ Based on summary calculations. (see relevant figure)  
64 2/ Based on detailed calculations. (see relevant figure)  
65 3/ Based on production & supply figures of aggregate  
66 4/ Inputs without superscript based on interview estimates



3. IMPORTED CONSTRUCTION Technology 1: Fired - Brick Walls, Reinforced Concrete Roof.  
Model of Construction Variables and their Effects on Basic, CASH - FLOW & Savings Criteria.

II.A: TECHNOLOGY CHOICE CRITERIA: CASH - FLOW FROM CONSTRUCTION EXPENDITURES

II.C: CONSTRUCTION ANALYSIS: BY INPUTS. Summary One.											
INPUTS			QUANTITIES			COSTS (Rs)			INPUT		
c	d	e	f	g	i	j	k	l	m	n	o
TOTALS		20470	100.00								
1.0	Materials	V	V	1574	76	1574	76	V	V	1574	76
1.1	Local (Low-Import/Transp)			6382	31	6382	31			6382	31
1.1	Earth (cf)			306	1.50	0.55	0.82			306	1.50
2.0	Sand (cf)			487	2.38	4.00	9.52			487	2.38
3.0	Hood Forms (17 days rent)			704	3.44	704	3.44			704	3.44
4.0	Coal-Fired Bricks (#)			9482	46.32	0.32	3034			9482	46.32
5.0	Coal-Fired Roof Tiles(#)			760	3.71	0.55	418			760	3.71
6.0	Brick Ballast (cf)			31	0.15	3.50	109			31	0.15
7.0	1.2 Non - Local (Hi'Import/Transp)			89	0.43	17.80	1584			89	0.43
8.0	Bitumin (lbs)			261	1.28	0.40	104			261	1.28
9.0	Aggregate (cf)			248	1.21	6.50	1613			248	1.21
10.0	Cement (cwt,50kg,1bag)			62	0.30	72.50	4495			62	0.30
11.0	Mild-Steel Bars 1/2"0 (kg)			310	1.51	4.50	1395			310	1.51
12.0	Labour (Man Days)			147	0.72	4896	23.92			147	0.72
13.0	0.1 Skilled			49	0.24	60.00	2920			49	0.24
14.0	0.2 Unskilled			99	0.48	20.00	1976			99	0.48
TOTALS				20470	100.00					20470	100.00

II.A: TECHNOLOGY CHOICE CRITERIA: CASH - FLOW FROM CONSTRUCTION EXPENDITURES											
II.C: CONSTRUCTION ANALYSIS: BY INPUTS. Summary One.											
INPUTS			QUANTITIES			COSTS (Rs)			INPUT		
c	d	e	f	g	i	j	k	l	m	n	o
TOTALS		20470	100.00								
1.0	Materials	V	V	1574	76	1574	76	V	V	1574	76
1.1	Local (Low-Import/Transp)			6382	31	6382	31			6382	31
1.1	Earth (cf)			306	1.50	0.55	0.82			306	1.50
2.0	Sand (cf)			487	2.38	4.00	9.52			487	2.38
3.0	Hood Forms (17 days rent)			704	3.44	704	3.44			704	3.44
4.0	Coal-Fired Bricks (#)			9482	46.32	0.32	3034			9482	46.32
5.0	Coal-Fired Roof Tiles(#)			760	3.71	0.55	418			760	3.71
6.0	Brick Ballast (cf)			31	0.15	3.50	109			31	0.15
7.0	1.2 Non - Local (Hi'Import/Transp)			89	0.43	17.80	1584			89	0.43
8.0	Bitumin (lbs)			261	1.28	0.40	104			261	1.28
9.0	Aggregate (cf)			248	1.21	6.50	1613			248	1.21
10.0	Cement (cwt,50kg,1bag)			62	0.30	72.50	4495			62	0.30
11.0	Mild-Steel Bars 1/2"0 (kg)			310	1.51	4.50	1395			310	1.51
12.0	Labour (Man Days)			147	0.72	4896	23.92			147	0.72
13.0	0.1 Skilled			49	0.24	60.00	2920			49	0.24
14.0	0.2 Unskilled			99	0.48	20.00	1976			99	0.48
TOTALS				20470	100.00					20470	100.00

III.A: TECHNOLOGY CHOICE CRITERIA 3: IMPACT ON SAVINGS

III.A: TECHNOLOGY CHOICE CRITERIA 3: IMPACT ON SAVINGS											
INPUTS			QUANTITIES			COSTS (Rs)			INPUT		
c	d	e	f	g	i	j	k	l	m	n	o
TOTALS		20470	100.00								
1.0	Materials	V	V	1574	76	1574	76	V	V	1574	76
1.1	Local (Low-Import/Transp)			6382	31	6382	31			6382	31
1.1	Earth (cf)			306	1.50	0.55	0.82			306	1.50
2.0	Sand (cf)			487	2.38	4.00	9.52			487	2.38
3.0	Hood Forms (17 days rent)			704	3.44	704	3.44			704	3.44
4.0	Coal-Fired Bricks (#)			9482	46.32	0.32	3034			9482	46.32
5.0	Coal-Fired Roof Tiles(#)			760	3.71	0.55	418			760	3.71
6.0	Brick Ballast (cf)			31	0.15	3.50	109			31	0.15
7.0	1.2 Non - Local (Hi'Import/Transp)			89	0.43	17.80	1584			89	0.43
8.0	Bitumin (lbs)			261	1.28	0.40	104			261	1.28
9.0	Aggregate (cf)			248	1.21	6.50	1613			248	1.21
10.0	Cement (cwt,50kg,1bag)			62	0.30	72.50	4495			62	0.30
11.0	Mild-Steel Bars 1/2"0 (kg)			310	1.51	4.50	1395			310	1.51
12.0	Labour (Man Days)			147	0.72	4896	23.92			147	0.72
13.0	0.1 Skilled			49	0.24	60.00	2920			49	0.24
14.0	0.2 Unskilled			99	0.48	20.00	1976			99	0.48
TOTALS				20470	100.00					20470	100.00

III.A: TECHNOLOGY CHOICE CRITERIA 3: IMPACT ON SAVINGS											
INPUTS			QUANTITIES			COSTS (Rs)			INPUT		
c	d	e	f	g	i	j	k	l	m	n	o
TOTALS		20470	100.00								
1.0	Materials	V	V	1574	76	1574	76	V	V	1574	76
1.1	Local (Low-Import/Transp)			6382	31	6382	31			6382	31
1.1	Earth (cf)			306	1.50	0.55	0.82			306	1.50
2.0	Sand (cf)			487	2.38	4.00	9.52			487	2.38
3.0	Hood Forms (17 days rent)			704	3.44	704	3.44			704	3.44
4.0	Coal-Fired Bricks (#)			9482	46.32	0.32	3034			9482	46.32
5.0	Coal-Fired Roof Tiles(#)			760	3.71	0.55	418			760	3.71
6.0	Brick Ballast (cf)			31	0.15	3.50	109			31	0.15
7.0	1.2 Non - Local (Hi'Import/Transp)			89	0.43	17.80	1584			89	0.43
8.0	Bitumin (lbs)			261	1.28	0.40	104			261	1.28
9.0	Aggregate (cf)			248	1.21	6.50	1613			248	1.21
10.0	Cement (cwt,50kg,1bag)			62	0.30	72.50	4495			62	0.30
11.0	Mild-Steel Bars 1/2"0 (kg)			310	1.51	4.50	1395			310	1.51
12.0	Labour (Man Days)			147	0.72	4896	23.92			147	0.72
13.0	0.1 Skilled			49	0.24	60.00	2920			49	0.24
14.0	0.2 Unskilled			99	0.48	20.00	1976			99	0.48
TOTALS				20470	100.00					20470	100.00

III.A: TECHNOLOGY CHOICE CRITERIA 3: IMPACT ON SAVINGS											
INPUTS			QUANTITIES			COSTS (Rs)			INPUT		
c	d	e	f	g	i	j	k	l	m	n	o
TOTALS		20470	100.00								
1.0	Materials	V	V	1574	76	1574	76	V	V	1574	76
1.1	Local (Low-Import/Transp)			6382	31	6382	31			6382	31
1.1	Earth (cf)			306	1.50	0.55	0.82			306	1.50
2.0	Sand (cf)			487	2.38	4.00	9.52			487	2.38
3.0	Hood Forms (17 days rent)			704	3.44	704	3.44			704	3.44
4.0	Coal-Fired Bricks (#)			9482	46.32	0.32	3034			9482	46.32
5.0	Coal-Fired Roof Tiles(#)			760	3.71	0.55	418			760	3.71
6.0	Brick Ballast (cf)			31	0.15	3.50	109			31	0.15
7.0	1.2 Non - Local (Hi'Import/Transp)			89	0.43	17.80	1584			89	0.43
8.0	Bitumin (lbs)			261	1.28	0.40	104			261	1.28
9.0	Aggregate (cf)			248	1.21	6.50	1613			248	1.21
10.0	Cement (cwt,50kg,1bag)			62	0.30	72.50	4495			62	0.30
11.0	Mild-Steel Bars 1/2"0 (kg)			310	1.51	4.50	1395			310	1.51
12.0	Labour (Man Days)			147	0.72	4896	23.92			147	0.72
13.0	0.1 Skilled			49	0.24	60.00	2920			49	0.24
14.0	0.2 Unskilled			99	0.48	20.00	1976			99	0.48
TOTALS				20470	100.00					20470	100.00

Indigenous Construction Technology 1: Sun - Brick Walls, Timber Roof.  
 MODEL OF CONSTRUCTION VARIABLES & THEIR EFFECT ON BASIC, COST-BENEFIT & SAVINGS CRITERIA

I.C. CONSTRUCTION ANALYSIS: BY INPUTS. Summary One.

INPUTS	QUANTITIES	COSTS (Rs)	Unit Total	/100Rs
c	d	e	f	g
TOTALS	Inputs	Inputs	4090	100.00
1.0 Materials	2258	55.21		
1.1 Local (Low-Import/Transp)	658	16.08	0.55	2258
Earth (cf)	91	2.24	0.75	362
Clay (cf)	6	0.14	Free	63
Dung (cf)	236	5.77	Free	1.68
Straw (lbs)	250	6.11	Free	0.00
Grass (sf)	250	6.11	Free	0.00
Reed Mats; Sarkanda (sf)	325	7.95	0.44	0.00
Shirkee (sf)	2	0.05	225.00	83
Accacia Beams: 4"x8"x14' (#)	7	0.18	0.00	143
Uncut Timber Required (cf)	45	1.10	8.00	11.00
Battens: 2.5"x3"x6' (#)	17	0.41	0.00	0.00
Uncut Timber Required (cf)	13203	322.80	0.06	350
Sun - Bricks (#)	0	0.00	0.00	8.80
1.2 Non-Local (Hr? Imprt/Transp)	0	0.00	0.00	0.00
2.0 Labour (Man Days)	85	2.07		1832
0.1 Skilled	22	0.55		44.79
0.2 Unskilled	62	1.53		895
				21.88
				937
				22.92

I.C. INPUTS: Summarised for Cost-Benefit Analysis

Cost-Benefit Analysis	Costs	/Rs100
o	p	r
TOTALS	100.00	
1.0 Materials	55.21	
1.1 Local: (Low-Import/Transp)	55.21	
Dung, Straw, Grass (Free)	0.00	
Earth & Clay	10.52	
Reed Mats	5.51	
Timber Beams & Battens	19.80	
Sun-Bricks	19.37	
1.2 Non-Local (Hr? Imprt/Transp)	0.00	
2.0 Labour	44.79	
2.1 Skilled	21.88	
2.2 Unskilled	22.92	

III.B. COST - BENEFIT ANALYSES.

1: FINANCIAL ANALYSIS	(Using Market Prices)	(02)	(102)	(202)
v	w	x		
TOTALS	100.00	90.91	83.33	
	4090	3408		
1.0 Materials	55.21	50.19	46.00	
1.1 Local: (Low-Import/Transp)	55.21	50.19	46.00	
Dung, Straw, Grass (Free)	0.00	0.00	0.00	
Earth & Clay	10.52	9.56	8.77	
Reed Mats	5.51	5.01	4.59	
Timber Beams & Battens	19.80	18.00	16.50	
Sun-Bricks	19.37	17.61	16.14	
1.2 Non-Local (Hr? Imprt/Transp)	0.00	0.00	0.00	
2.0 Labour	44.79	40.72	37.33	
2.1 Skilled	21.88	19.89	18.23	
2.2 Unskilled	22.92	20.83	19.10	

(Construction Costs-Expenditures Discounted Over One Year)

ADJUSTMENT FACTOR (AF)	(To Obtain Shadow Prices)	12: ECONOMIC ANALYSIS	(Using Shadow Prices)	13: SOCIAL ANALYSIS	(Income Distribution)
Tradeable Content	AF Weighted	(02)	(102)	(202)	At 0% Discount Rate
ab	ac	ah	ai	aj	Proj. Htr. Bsns. Govt
Inputs		95.42	86.74	79.51	At 0% Discount Rate
		3903	3252		Proj. Htr. Bsns. Govt
1.0 Materials		55.21	50.19	46.00	18.33
1.1 Local: (Low-Import/Transp)		55.21	50.19	46.00	15.28
Dung, Straw, Grass (Free)		0.00	0.00	0.00	
Earth & Clay		10.52	9.56	8.77	
Reed Mats		5.51	5.01	4.59	
Timber Beams & Battens		19.80	18.00	16.50	
Sun-Bricks		19.37	17.61	16.14	
1.2 Non-Local (Hr? Imprt/Transp)		0.00	0.00	0.00	
2.0 Labour		40.21	36.56	33.51	
2.1 Skilled		21.88	19.89	18.23	
2.2 Unskilled		18.33	16.67	15.28	

III.B. TECHNOLOGY CHOICE CRITERIA: IMPACT ON SAVINGS

Income Distribution	Marginal Propensity to Save (INPUT=>)	SAVINGS DISTRIBUTION	NET EFFECT ON SAVINGS
if @ject funds from:			
At 0% Discount	-4.58	-0.92	-0.9
Funding Source:	4.58	0.00	
Govt. Or Low Y. Htr. Bsns. Govt	0.00	0.00	
Govt	0.00	0.00	
Low-Income Person	0.15	0.00	
	0.2	0.00	

X: TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

Criteria	Description	Value
1 Spatial Efficiency:	Internal Space/Built Area	0.75
2 Cost Effectiveness:	Internal Space/Rs100 (sf)	5.31
Space & Employment Achieved:	R/s/sf of Internal Space (Rs)	18.85
/Rs 100 Expenditure)	Onsite Employment: Total (Md)	2.07
3 Labour Productivity:	Handys/sf of Internal Space (Md)	1.53
	Unskilled	0.39

I 4.2.

Fig. Imported Construction Technology 1: Fired - Brick Walls, Reinforced Concrete Roof. (continued) MODEL OF CONSTRUCTION VARIABLES & THEIR EFFECT ON BASIC, COST-BENEFIT & SAVINGS CRITERIA

II.B: TECHNOLOGY CHOICE CRITERIA 2.B)

EFFECT OF DISCOUNTING & SHADOW PRICING ON COSTS, BENEFITS & INCOME DISTRIBUTION

III.B: COST - BENEFIT ANALYSES. Construction Costs Discounted Over One Year.

I.C: CONSTRUCTION ANALYSIS: BY INPUTS. Summary One.

INPUTS	QUANTITIES		COSTS (RS)		/100RS
	Total	/100RS	Total	/Unit	
1.0 Materials	15574	76	6382	31	
1.1 Local (Low-Import/Transp)	6382	31	168	0.82	
Earth (cf)	487	2.38	1949	9.52	
Sand (cf)	9482	46.32	704	3.44	
Wood Forms (17 days rent)	760	3.71	418	2.04	
Coal-Fired Bricks (B)	31	0.15	109	0.53	
Coal-Fired Roof Tiles (R)	89	0.43	1584	7.74	
Brick Ballast (cf)	261	1.28	104	0.51	
Bitumen (lbs)	248	1.21	1613	7.88	
Polythene (sf)	62	0.30	4495	21.96	
Aggregate (cf)	310	1.51	1395	6.81	
Cement (cwt, 50kg, 1bag)					
Mild-Steel Bars 1/2" (kg)					
2.0 Labour (Man Days)	147	0.72	4896	23.92	
0.1 Skilled	49	0.24	2920	14.26	
0.2 Unskilled	99	0.48	1976	9.65	
TOTALS	20470	100.00			

I.C. INPUTS: Summarised For Cost-Benefit Analysis

INPUTS	Costs	Rs/100
1.0 Materials	76.08	31.18
1.1 Local (Low Import/Transp)	31.18	13.78
Earth, Sand, Formwork	13.78	17.40
Bricks, Tiles, Ballast	17.40	44.91
1.2 Non-Local (Hr/Import/Trsp)	44.91	8.25
Bitumen, Polythene	8.25	7.88
Aggregate	7.88	21.96
Cement	21.96	6.81
Steel Bars	6.81	23.92
2.0 Labour	23.92	14.26
2.1 Skilled	14.26	9.65
2.2 Unskilled	9.65	
TOTALS	100.00	90.91

II: FINANCIAL ANALYSIS (Using Market Prices)

INPUTS	(02)	(10X)	(20X)
1.0 Materials	59.17	63.40	66.25
1.1 Local (Low Import/Transp)	28.34	25.98	30.31
Earth, Sand, Formwork	12.53	11.49	13.78
Bricks, Tiles, Ballast	15.81	14.50	15.53
1.2 Non-Local (Hr/Import/Trsp)	40.82	37.42	35.94
Bitumen, Polythene	7.50	6.87	8.25
Aggregate	7.17	6.57	7.88
Cement	19.95	18.30	14.49
Steel Bars	6.20	5.68	5.32
2.0 Labour	21.74	19.93	21.99
2.1 Skilled	12.97	11.89	14.26
2.2 Unskilled	8.78	8.05	7.72
TOTALS	90.91	83.33	88.23

ADJUSTMENT FACTOR (AF) (For Shadow Price)

INPUTS	AF	AF	AF
1.0 Materials	1.00	-0.05	-0.05
1.1 Local (Low Import/Transp)	1.00	?	0.00
Earth, Sand, Formwork	0.20	?	0.00
Bricks, Tiles, Ballast	1.00	-0.34	-0.34
1.2 Non-Local (Hr/Import/Trsp)	1.00	-0.22	-0.22
Bitumen, Polythene	1.00	-0.20	-0.20
Aggregate	1.00	-0.20	-0.20
Cement	1.00	-0.20	-0.20
Steel Bars	1.00	-0.20	-0.20
2.0 Labour	1.00	-0.20	-0.20
2.1 Skilled	1.00	-0.20	-0.20
2.2 Unskilled	1.00	-0.20	-0.20
TOTALS	1.00	-0.20	-0.20

II: ECONOMIC ANALYSIS (Using Shadow Prices)

INPUTS	(02)	(10X)	(20X)
1.0 Materials	60.23	55.21	56.25
1.1 Local (Low Import/Transp)	27.55	25.26	30.31
Earth, Sand, Formwork	12.53	11.49	13.78
Bricks, Tiles, Ballast	15.02	13.77	15.53
1.2 Non-Local (Hr/Import/Trsp)	32.67	29.95	35.94
Bitumen, Polythene	7.50	6.87	8.25
Aggregate	7.17	6.57	7.88
Cement	13.18	12.08	14.49
Steel Bars	4.83	4.43	5.32
2.0 Labour	19.99	18.32	21.99
2.1 Skilled	12.97	11.89	14.26
2.2 Unskilled	7.02	6.44	7.72
TOTALS	80.21	73.53	88.23

III: SOCIAL ANALYSIS (Income Distribution)

INPUTS	AF	AF	AF
1.0 Materials	-11.77	1.93	1.50
1.1 Local (Low Import/Transp)	-11.77	1.93	1.50
Earth, Sand, Formwork	0.00	0.00	0.00
Bricks, Tiles, Ballast	-7.47	1.50	7.47
1.2 Non-Local (Hr/Import/Trsp)	-1.50	1.50	1.50
Bitumen, Polythene	0.00	0.00	0.00
Aggregate	0.00	0.00	0.00
Cement	-7.47	1.50	7.47
Steel Bars	-1.50	1.50	1.50
2.0 Labour	-11.77	1.93	1.50
2.1 Skilled	-11.77	1.93	1.50
2.2 Unskilled	-11.77	1.93	1.50
TOTALS	-11.77	1.93	1.50

III.B: TECHNOLOGY CHOICE CRITERIA 3b: IMPACT ON SAVINGS

Criteria	AF 0% Discount	Funding Source	Govt. D/Low Y. Hrtr. Bsns. Govt.
Income Distribution	-11.77	-11.77	1.93
Marginal Propensity to Save	0.20	0.00	0.10
SAVINGS DISTRIBUTION	-2.35	0.00	0.15
NET EFFECT ON SAVINGS	-11.77	-11.77	1.93
If Project Funds from:			
(a) Government	-0.54		
(b) Low - Income Person	1.82		

3 Labour Productivity:

Criteria	Internal Space/Built Area	Internal Space/Rs100 (sf)	Internal Space/Rs (Rs)	Onsite Employment: Total (Hd)	Unskilled	Handys/s/sf of Internal Space/Hd
1 Spatial Efficiency:	0.83	1.17	85.29	0.72	0.48	0.61
2 Cost Effectiveness:						
(Space & Employment Achieved /Rs 100 Expenditure)						
3 Labour Productivity:						

I 4.2.







II. 1.2 IMPORTED PRODUCTION Technology 1: Trench-Rotary Type, Coal - Oil Fired Brick Kiln.  
 Model of Production Variables & their Effect on Basic, CASH - FLOW, & Savings Criteria

III.A: PRODUCTION ANALYSIS: Summary One.									
VARIABLES 1:	Description	Inputs							
1 Capacity:Bricks/Load/Yr.:	400	400 K bricks/30 days/Load.3 loads/year	3600 K bricks						
2 Output: Production Cycle:	6	6 loads/year.	2400 K bricks						
3 Production Period	8	8 months. October to June. 5 year lease							
4 Financing	0.372 CRF for	5 year loan at 25% interest							
VARIABLES 2:									
d	Price (Rs.)	/Kbrs./Load	/year	/Kbrs	/Rs100				
1A RECEIPTS (Benefits)	303	121200	727200	303.00	100.00				
1B EXPENDITURES (Costs)	118118	708710	295.30	97.46					
1C INCOME (Net Values)	3082	18490	7.70	2.54					
VARIABLES 3:									
QUANTITIES									
COSTS (Rs)									
1.0 Capital	57460	1636	9815	4.09	1.35				
1.1 Plant	60000	1000	6000	2.50	0.83				
1.2 Equipment (Rs)	7460	636	3815	1.59	0.52				
1.2.0 Kiln Land (Ac.)	1.5	0.0038	0.0012	3000	750	4500	1.88	0.62	
1.3.0 Materials	86332	517992	215.83	71.23					
1.3.1 Local (Low Import)	14204	85224	35.51	11.72					
1.3.2 Non-Local	840	5040	2.10	0.69					
Water (hrs)	20	240	1440	0.60	0.20				
Sand (cf)	1200	3.0000	0.9901	0.67	0.66				
Wood (cads)	880	2.2000	0.7261	14	12320	73920	30.80	10.17	
1.3.2 Non Local (High Import)	72128	432768	180.32	59.51					
Oil (drum=50 galls)	48	0.1200	0.0396	434	20832	124992	52.08	17.19	
Coal (Truck=10tons)	8	0.0200	0.0066	2762	22096	132576	55.24	18.23	
Transport (coal trucks)	8	0.0200	0.0066	3650	29200	175200	73.00	24.09	
4 Labour (Rs/Mandays, Rs)	59	4.92	1.62	27000	162000	67.50	22.28		
4.1 Skilled/Up.Y. (Rs/mth)	2	0.17	0.06	1550	2067	12400	5.17	1.71	
4.2 Unskilled/Lo.Y (Rest)	57	4.75	1.57	24933	149600	62.33	20.57		
Piece Workers (Rs/Kbrs)	50	4.17	1.38	50	20000	120000	50.00	16.50	
Wage Workers (Rs/mth)	7	0.58	0.19	3700	4933	29500	12.33	4.07	
5.0 Miscellaneous	2401	14403	6.00	1.98					
Taxes (Rs/year)	7	467	2800	1.17	0.39				
Interest (Rs/year)	1934	11603	4.83	1.60					
TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA									
1 Cost Minimisation	:Production Cost/Unit Output :295.30 97.46								
2 Profitability	:Net Return on Expenditures :7.70 2.54								
3 Capital Productivity	:(1) Capital Investment/Unit Output :4.09 1.35								
	:(2) Capital Investment/Unit Employment (Mdays) Total :0.83								
	:Unskilled :0.86								
4 Labour Productivity	:Mandays/Unit Output :4.92 1.62								

TECHNOLOGY CHOICE CRITERIA 2.a.									
CASH-FLOW FROM MATERIALS' PURCHASES: Distribution of Receipts; Spatially and by Income Groups									
III.A: CASH - FLOW ANALYSIS; Spatially & by Income Group									
I: COEFFICIENTS of Distribution									
Spatially									
:Ext. Dst. :Within District :Govt. :									
:Urb. Rur. :Up. Y. Lo. Y. :									
:aa ab :ad ae :ag ah :aj :									
:Input :									
:V :									
:A RECEIPTS :									
:B EXPENDITURES :									
:C INCOME :									
:A :									
:B :									
:C :									
:D :									
:E :									
:F :									
:G :									
:H :									
:I :									
:J :									
:K :									
:L :									
:M :									
:N :									
:O :									
:P :									
:Q :									
:R :									
:S :									
:T :									
:U :									
:V :									
:W :									
:X :									
:Y :									
:Z :									
:AA :									
:AB :									
:AC :									
:AD :									
:AE :									
:AF :									
:AG :									
:AH :									
:AI :									
:AJ :									
:AK :									
:AL :									
:AM :									
:AN :									
:AO :									
:AP :									
:AQ :									
:AR :									
:AS :									
:AT :									
:AU :									
:AV :									
:AW :									
:AX :									
:AY :									
:AZ :									
:BA :									
:BB :									
:BC :									
:BD :									
:BE :									
:BF :									
:BG :									
:BH :									
:BI :									
:BJ :									
:BK :									
:BL :									
:BM :									
:BN :									
:BO :									
:BP :									
:BQ :									
:BR :									
:BS :									
:BT :									
:BU :									
:BV :									
:BW :									
:BX :									
:BY :									
:BZ :									
:CA :									
:CB :									
:CC :									
:CD :									
:CE :									
:CF :									
:CG :									
:CH :									
:CI :									
:CJ :									
:CK :									
:CL :									
:CM :									
:CN :									
:CO :									
:CP :									
:CQ :									
:CR :									
:CS :									
:CT :									
:CU :									
:CV :									
:CW :									
:CX :									
:CY :									
:CZ :									
:DA :									
:DB :									
:DC :									
:DD :									
:DE :									
:DF :									
:DG :									
:DH :									
:DI :									
:DJ :									
:DK :									
:DL :									
:DM :									
:DN :									
:DO :									
:DP :									
:DQ :									
:DR :									
:DS :									
:DT :									
:DU :									
:DV :									
:DW :									
:DX :									
:DY :									
:DZ :									
:EA :									
:EB :									
:EC :									
:ED :									
:EE :									
:EF :									
:EG :									
:EH :									
:EI :									
:EJ :									
:EK :									
:EL :									
:EM :									
:EN :									
:EO :									
:EP :									
:EQ :									
:ER :									
:ES :									
:ET :									
:EU :									
:EV :									
:EW :									
:EX :									
:EY :									
:EZ :									
:FA :									
:FB :									
:FC :									
:FD :									
:FE :									
:FF :									
:FG :									
:FH :									
:FI :									
:FJ :									
:FK :									
:FL :									
:FM :									
:FN :									
:FO :									
:FP :									
:FQ :									
:FR :									
:FS :									
:FT :									
:FU :									
:FV :									
:FW :									
:FX :									
:FY :									
:FZ :									
:GA :									
:GB :									
:GC :									
:GD :									
:GE :									
:GF :									
:GG :									
:GH :									
:GI :									
:GJ :									
:GK :									
:GL :									
:GM :									
:GN :									
:GO :									
:GP :									
:GQ :									
:GR :									
:GS :									
:GT :									
:GU :									
:GV :									
:GW :									
:GX :									
:GY :									
:GZ :									
:HA :									
:HB :									
:HC :									
:HD :									
:HE :									
:HF :									
:HG :									
:HH :									
:HI :									
:HJ :									
:HK :									
:HL :									
:HM :									
:HN :									
:HO :									
:HP :									
:HQ :									
:HR :									
:HS :									
:HT :									
:HU :									
:HV :									
:HW :									
:HX :									
:HY :									
:HZ :									
:IA :									
:IB :									
:IC :									
:ID :									
:IE :									
:IF :									
:IG :									
:IH :									
:II :									
:IJ :									
:IK :									
:IL :									
:IM :									
:IN :									
:IO :									
:IP :									
:IQ :									
:IR :									
:IS :									
:IT :									
:IU :									
:IV :									
:IW :									
:IX :									
:IY :									
:IZ :									
:JA :									
:JB :									
:JC :									
:JD :									
:JE :									
:JF :									
:JG :									
:JH :									
:JI :									
:JJ :									
:JK :									
:JL :									
:JM :									
:JN :									
:JO :									
:JP :									
:JQ :									
:JR :									
:JS :									
:JT :									
:JU :									
:JV :									
:JW :									
:JX :									
:JY :									
:JZ :									
:KA :									
:KB :									
:KC :									
:KD :									
:KE :									
:KF :									
:KG :									
:KH :									
:KI :									
:KJ :									
:KK :									
:KL :									
:KM :									
:KN :									
:KO :									
:KP :									
:KQ :									
:KR :									
:KS :									
:KT :									
:KU :									
:KV :									
:KW :									
:KX :									
:KY :									
:KZ :									
:LA :									
:LB :									
:LC :									
:LD :									
:LE :									
:LF :									
:LG :									
:LH :									
:LI :									
:LJ :									
:LK :									
:LL :									
:LM :									
:LN :									
:LO :									
:LP :									
:LQ :									
:LR :									
:LS :									
:LT :									
:LU :									
:LV :									
:LW :									
:LX :									
:LY :									
:LZ :									
:MA :									
:MB :									
:MC :									
:MD :									
:ME :									
:MF :									
:MG :									
:MH :									
:MI :									
:MJ :									
:MK :									
:ML :									
:MN :									
:MO :									
:MP :									
:MQ :									
:MR :									
:MS :									
:MT :									
:MU :									
:MV :									
:MW :									
:MX :									
:MY :									
:MZ :									
:NA :									
:NB :									
:NC :									
:ND :									
:NE :									
:NF :									
:NG :									
:NH :									
:NI :									
:NJ :									
:NK :									
:NL :									
:NM :									
:NO :									
:NP :									
:NQ :									
:NR :									
:NS :									
:NT :									
:NU :									
:NV :									
:NW :									
:NX :									
:NY :									
:NZ :									
:OA :									
:OB :									
:OC :									
:OD :									
:OE :									
:OF :									
:OG :									
:OH :									
:OI :									
:OJ :									
:OK :									
:OL :									
:OM :									
:ON :									
:OO :									
:OP :									
:OQ :									
:OR :									
:OS :									
:OT :									
:OU :									
:OV :									
:OW :									
:OX :									
:OY :									
:OZ :									
:PA :									
:PB :									
:PC :									
:PD :									
:PE :									
:PF :									
:PG :									
:PH :									
:PI :									
:PJ :									
:PK :									
:PL :									
:PM :									
:PN :									
:PO :									
:PP :									
:PQ :									
:PR :									
:PS :									
:PT :									
:PU :									
:PV :									
:PW :									
:PX :									
:PY :									
:PZ :									
:QA :									
:QB :									
:QC :									
:QD :									
:QE :									
:QF :									
:QG :									
:QH :									
:QI :									
:QJ :									
:QK :									
:QL :									
:QM :									
:QN :									
:QO :									
:QP									



VARIABLES 1	Unit	Description
Capacity/cf/unit/month	1875	1875 cf
Output: Production Period	1875	9 months
Production Period	9	9 months, September to June
Financing	0.372	CRF for 5 year loan at 25% interest

VARIABLES 2	QTY. cf	PRICE (\$)	ANNUALISED (\$/year)	CF/cf	RS/100
RECEIPTS (cf) 1tree=50cf	1875	54621	491588	29.13	100.00
Beans:15cf/tree(\$)=3.05cf(\$)	184	41496	373463	703.13	75.97
Fuelwood: 35cf (cf)	1313	13125	118125	10.00	24.03
EXPENDITURES					
INCOME					
		31888	287631	17.18	58.51
		22753	203957	11.95	41.49

INPUTS (EXPENDITURES)	QUANTITIES	COSTS(\$)
VARIABLES 3	/unit /cf	/unit /month/year /cf
0.Capital		22320
1.Plant: 1 room, 2 shelters		8000
2.Equipment (\$)		14320
Electric Motor (20hp)		6000
Saw, 3/3" dia.		8000
Saw sharpener		320
0.Land (Acres)	0.13	87
0.Materials		
1 Local (Low Import)		25530
Accacia Trees(50cf,50mnds)	38	650
(1tree=50cf=15cfibins.& 35cf fuel,1bgrs.old)		
Electricity	0	800
Grease for Saw	0	100
2 Non-Local(1import/Transp)	0	355
Replace blade & belt	0	355

TECHNOLOGY CHOICE	CRITERIA 1: BASIC CRITERIA
1 Cost Minimization:	Production Cost/Unit Output
2 Profitability:	Net Return on Expenditures
3 Capital Productivity:	1) Capital Investment/Unit Output
	2) Capital Investment/Unit Employment(MD)
4 Labour Productivity:	Handays/Unit Output

TECHNOLOGY CHOICE	CRITERIA 2: CASH - FLOW FROM MATERIALS' PURCHASES, Distribution of Receipts
1.A.2a) PRODUCTION ANALYSIS:	Annualised Cash Flow
Summary Two:	0x
14: RECEIPTS	100.00
18: EXPENDITURES	58.51
10: INCOME	41.49

TECHNOLOGY CHOICE	CRITERIA 2: CASH - FLOW FROM MATERIALS' PURCHASES, Distribution of Receipts
11.A.2a) PRODUCTION ANALYSIS:	Annualised Cash Flow
Summary Two:	0x
14: RECEIPTS	100.00
18: EXPENDITURES	58.51
10: INCOME	41.49
11.A.2b) DISTRIBUTION OF RECEIPTS (From Materials' Expenditures)	
External District:	Within District
Urban Rural	Upper Y.Lower Y.
an	ao
aq	ar
at	au
av	

TECHNOLOGY CHOICE	CRITERIA 3: EFFECT ON SAVINGS
III.A: SAVINGS ANALYSIS	Spatially
External District:	Within District
Urban Rural	Upper Y.Lower Y.
an	ao
aq	ar
at	au
av	

Indigenous Production Technology 1: SAW-MILL for Timber Beams & BATTENS  
 2a) Production Variables & Their Effects on CASH - FLOW, BASIC & SAVINGS CRITERIA.

I.A: PRODUCTION ANALYSIS; Summary One.

VARIABLES 1.	Unit	Description
1 Capacity:cf/unit/month	1875	25 cf/tree3 Trees/day,
2 Output: Production Period:	1875 9 months	16875 cf/year Sept. to June
3 Production Period	9	9 months. September to June
4 Financing	0.372	CRF for 5 year loan at 25% interest

VARIABLES 2.	PRICE (Rs)	PRICE /#_cf	/month	/year	/cf	/Rs100
A: RECEIPTS (cf) 1tree=25cf	1875	27750	249750	14.80	100.00	
Battens: 8cf (#)1=0.32cf	1875	8	15000	135000	25.00	54.05
Fuelwood: 17cf (cf)	1275	10	12750	114750	10.00	45.95
B: EXPENDITURES		26243	237006	14.18	94.90	
C: INCOME		1507	12744	0.62	5.10	

VARIABLES 3.	QUANTITIES	COSTS (Rs)
unit /cf	/Rs100	/unit /month/25d /year /cf /Rs100
11.0.Capital	22320	186 2232
11.1.Plant: 1 room, 2 shelters:	8000	67 800
11.2.Equipment (#s)	14320	119 1432
Electric Motor (20hp)	6000	
Saw 3'3" dia.	8000	
Saw sharpener	320	
12.0.Land (Acres)	8000	ERR 8000
13.0 Materials	75	0.04 0.27
13.1 Local (Low Import)	20005	180045
Accacia (25cf, 25lands)	19650	176850
(tree=25cf=8cfbttns.	19750	168750
817cf fuel.10yrs.-old)		
Electricity	0	ERR 0
Grease for Saw	0	ERR 0
13.2 Non-Local(Import/Transp)	0	0
Replace blade & belt	0	355 3195
14.0 Labour (\$s, Mandays, Rs/nda)	7	2.30 0.78
14.1 Skilled/first saver	1	0.30 0.08
14.2 Unskilled/Lo.Y	6	2.60 0.70

TECHNOLOGY CHOICE CRITERIA 2.a: CASH - FLOW THROUGH MATERIALS' PURCHASES. (Distribution of Receipts)

III.A: CASH - FLOW ANALYSIS; Spatially and by Income Group

I.A.2) PRODUCTION ANALYSIS; Summary Two.	Annualised:		COEFFICIENTS of Distribution				DISTRIBUTION of Receipts ( From Materials' Purchases)					
	Cash Flow /Rs100	U	Ext. Dst. /Urb. Rur.	Within District /Urb. Rur.	Income Groups /Urb. Rur.	Spatially /Urban Rural	By Income Groups /Upper Y.Lower Y.	Govt. /Govt.				
A: RECEIPTS	100.00		0.25	0.75	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00
B: EXPENDITURES	94.90		0.13	0.87	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00
C: INCOME	5.10		0.12	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B: INPUTS (EXPENDITURES)												
11.0.Capital	0.89		0.40	0.60	0.20	0.40	0.00	0.00	0.00	0.00	0.00	0.00
11.1.Plant	0.32		1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.2.Equipment	0.57		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12.0.Land	0.42		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.0 Materials	72.09		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.1 Local (Low Import)	70.81		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.2 Non-Local	1.28		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.0 Labour	19.64		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.1 Skilled/Up. Y.	2.88		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.2 Unskilled/Lo.Y	16.76		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.0 Miscellaneous	1.85		0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Taxes:Local Govt.	0.32		0.00	1.00	0.33	0.65	0.33	1.00	0.00	0.00	0.00	0.00
Interest	1.54		0.00	1.00	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

III.A: SAVINGS ANALYSIS	Spatially	By Income Groups
External District	0.77	1.54
Within District	0.21	0.21
Total	0.98	1.75





CASH-FLOW THROUGH PURCHASES OF CEMENT

Fig. 1 V. 3  
(cement)

9	MATERIALS' MERCHANT	PRICE	CASH-FLOW THROUGH PURCHASES OF CEMENT		COEFFICIENTS of Distribution		DISTRIBUTION of Receipts																	
			/50kg bag	/truck	Income Groups	Spatially	External District	Within District	Urban	Rural	Upper	Lower												
10		/Rs100	g	h	l	m	n	o	p	r	s	u	y	z	aa	ab	ac	ad	ae	af	ah			
11																								
12																								
13																								
14	1A RECEIPTS	70.50	14100	100.00									93.62	6.38	6.21	0.18	5.86	0.52	0.50					
15	1B EXPENDITURES	66.60	13320	94.47									93.62	0.85	0.67	0.18	0.33	0.52	0.50					
16	1C INCOME	3.90	780	5.53									0.00	5.53	5.53	0.00	5.53	0.00	0.00					
17																								
18	INPUTS																							
19	(Expenditures)																							
20																								
21																								
22	11.0 NON-LOCAL-Hyderabad	56.00	13200	93.62									93.62	0.00	0.00	0.00	0.00	0.00	0.00					
23	11.1 Factory	51.00	10200	72.34																				
24	11.2 Truck to Sahiwal	15.00	3000	21.28																				
25																								
26	12.0 LOCAL	0.60	120	0.85									0.00	0.85	0.67	0.18	0.33	0.52	0.50					
27	12.1 Labour to unload	0.25	50	0.35									0.00	0.35	0.18	0.18	0.00	0.35	0.00					
28	12.2 Octroi Tax	0.35	70	0.50									0.00	0.50	0.50	0.00	0.33	0.16	0.50					

Source: Yahya Khan, Cement Agency Owner, Sahiwal City

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

	Spatially	Income Groups	External District	Within District	Urban	Rural	Upper	Lower
Distribution of Receipts	93.62	6.38	6.21	0.18	5.86	0.52	0.50	
Marginal Propensity to Save	0.10	0.02	0.03	0.02	0.10	0.00	0.20	
SAVINGS Distribution	9.36	0.13	0.19	.00	0.59	0.00	0.10	
SAVINGS TOTAL:	9.49	9.49	0.19	0.19	0.59	0.10	0.10	

Fig. IV.4 CASH-FLOW THROUGH PURCHASES OF STEEL RODS (mstods)

		II.A: CASH - FLOW THROUGH MATERIALS' PURCHASES. (Distribution of Receipts)													
		I: COEFFICIENTS of Distribution					II: DISTRIBUTION of Receipts								
		Spatially		Income Groups			Spatially		Income Groups						
		Ext. Dst.		Within District			External District		Within District						
		Urb. Rur.		Up.Y.Lo.Y.			UrbanRural		Upper Lower i.						
		l	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
9	MATERIALS' MERCHANT	PRICE	/kg	/truck	/Rs100										
10															
11															
12															
13															
14	RECEIPTS	4.5	45000	100.00					91.33	8.67	8.67	0.00	8.39	0.27	0.16
15	EXPENDITURES		41270	91.71					91.33	0.38	10.38	0.00	0.10	0.27	0.16
16	INCOME		3730	8.29					0.00	8.29	8.29	0.00	8.29	0.00	0.00
17															
18	INPUTS	COSTS (Rs)													
19	(Expenditures)	/unit	/truck	/Rs100											
20															
21															
22	1.0 NON-LOCAL (Lahore)		41100	91.33					91.33	0.00	10.00	0.00	0.00	0.00	0.00
23	1.1 Steel Merchant (/kg)	4.0	40000	88.89											
24	1.2 Trucker (/ton)	100	1000	2.22											
25	1.3 Labour (to load:/ton)	10	100	0.22											
26															
27	2.0 LOCAL (Sahiwal)		170	0.38					0.00	0.38	10.38	0.00	0.10	0.27	0.16
28	2.1 Octroi Tax(/truck)		70	0.16					0.00	0.16	10.16	0.00	0.10	0.05	0.16
29	2.2 Labour (to unload:/ton)	10	100	0.22					0.00	0.22	10.22	0.00	0.00	0.22	0.00
30															
31															
32															
33	Source: Iftikhar Haq, Rods, Girder Seller, Sahiwal City														

		II: TECHNOLOGY CHOICE CRITERIA 3: EFFECT ON SAVINGS													
		Spatially					Income Groups								
		External District		Within District			UrbanRural		Upper Lower i.						
		Urb. Rur.		Up.Y.Lo.Y.			UrbanRural		Upper Lower i.						
		l	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
	Distribution of Receipts	91.33	8.67	8.67	0.00	8.39	0.27	0.16	91.33	8.67	8.67	0.00	8.39	0.27	0.16
	Marginal Propensity to Save	0.10	0.02	10.02	0.01	0.10	0.00	0.20	0.10	0.02	10.02	0.01	0.10	0.00	0.20
	SAVINGS Distribution	9.31	0.17	10.17	0.00	0.84	0.00	0.03	9.31	0.17	10.17	0.00	0.84	0.00	0.03
	SAVINGS TOTAL:	9.31	0.17	10.17	0.00	0.84	0.00	0.03	9.31	0.17	10.17	0.00	0.84	0.00	0.03

CASH-FLOW THROUGH PURCHASES OF STEEL GIRDER

Fig. IV. 5  
(girder)

MATERIALS' MERCHANT		PRICE	/truck		/Rs100		
		/ft	/10tons		h		
d		f	g	h			
9	RECEIPTS	19.50	55714	100.00			
10	EXPENDITURES	18.86	53897	96.74			
11	INCOME	0.64	1817	3.26			
12	INPUTS	COSTS (Rs)					
13	(Expenditures)	/unit		/truck		/Rs100	
14		/10tons					
15	11.0 NON-LDCAL (Lahore)	18.82	53757	96.49			
16	11.1 Steel Merchant	18.50	52857	94.87			
17	11.2 Truck to Sahiwal	0.28	800	1.44			
18	11.3 Labour (load:Rs70/truck)	0.04	100	0.18			
19	12.0 LDCAL (Sahiwal)	0.05	140	0.25			
20	12.1 Octroi Tax(/truck)	0.02	70	0.13			
21	12.2 Labour (to unload:/ton)	0.02	70	0.13			

III.A: CASH - FLOW THROUGH MATERIALS' PURCHASES (Distribution of Receipts)

COEFFICIENTS of Distribution		DISTRIBUTION of Receipts											
Spatially		Income Groups		Spatially		By Income Groups							
Ext. Dst. Within District		Govt.		ExternalDistrict		Within District							
Urb. Rur. Up.Y.Lo.Y.		UrbanRural		Upper Lower i.									
l	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
96.49	3.51	13.47	0.04	3.34	0.17	0.13	96.49	3.51	13.47	0.04	3.34	0.17	0.13
96.49	0.25	10.21	0.04	0.08	0.17	0.13	96.49	0.25	10.21	0.04	0.08	0.17	0.13
0.00	3.26	13.26	0.00	3.26	0.00	0.00	0.00	3.26	13.26	0.00	3.26	0.00	0.00
10.00	1.00	1.00	0.00	1.00	0.00	0.00	10.00	1.00	1.00	0.00	1.00	0.00	0.00
11.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.66	0.33	0.66	0.33	1.00	0.00	0.25	10.21	0.04	0.08	0.17	0.13
10.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.13	10.08	0.04	0.08	0.04	0.13
10.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.13	10.13	0.00	0.00	0.13	0.00

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

Distribution of Receipts		Marginal Propensity to Save		SAVINGS Distribution		SAVINGS TOTAL:							
Spatially		Income Groups		Spatially		By Income Groups							
ExternalDistrict		Within District		ExternalDistrict		Within District							
UrbanRural		Upper Lower i.		UrbanRural		Upper Lower i.							
96.49	3.51	13.47	0.04	3.34	0.17	0.13	96.49	3.51	13.47	0.04	3.34	0.17	0.13
0.10	0.02	10.03	0.02	0.10	0.00	0.20	0.10	0.02	10.03	0.02	0.10	0.00	0.20
9.65	0.07	10.10	0.00	0.33	0.00	0.03	9.72	0.07	10.10	0.00	0.33	0.00	0.03
9.72	0.10	0.10	0.10	0.33	0.00	0.03	9.72	0.10	0.10	0.10	0.33	0.00	0.03

Source: Iftikhar Haq, Rods, Girder Seller, Sahiwal City  
Ahmad Iron Store, Pakpattan

Indigenous Construction Technology I: Sun - Brick Walls, Timber Roof.  
 MODEL OF CONSTRUCTION VARIABLES & THEIR EFFECT ON BASIC, CASH - FLOW, & SAVINGS CRITERIA

I.C: CONSTRUCTION ANALYSIS: BY INPUTS, Summary One.

VARIABLES	QUANTITIES	COSTS (RS)	Total /100RS
d	f	g	h
TOTALS	Inputs	Inputs	4090 100.00
1.0 Materials	2258	55.21	
1.1 Local (Low-Import/Transp)	2258	55.21	
Earth (cf)	658	16.08	0.55
Clay (cf)	91	2.24	0.75
Dung (cf)	5	0.14	Free
Straw (lbs)	236	5.77	Free
Brass (sf)	250	6.11	Free
Reed Mats; Sarkanda (sf)	250	6.11	0.33
Stroke (sf)	325	7.95	0.44
Accacia Beams; 4*8*31/4 (ft)	2	0.05	225.00
Uncut Timber Required (cf)	7	0.18	0.00
Battens; 2.5*4*5/8 (ft)	45	1.10	8.00
Uncut Timber Required (cf)	17	0.41	0.00
Sun - Bricks (#)	13203	322.80	0.05
1.2 Non-Local (Hi-Import/Transp)	0	0.00	0.00
2.0 Labour (Man Days)	85	2.07	1832
0.1 Skilled	22	0.55	40.00
0.2 Unskilled	62	1.53	15.00

I.C.2) INPUTS: Summarised For Cash - Flow Analysis

INPUTS	Flow Analysis
p	q
TOTALS	100.00
1.0 Materials	55.21
1.1 Local: (Lo-Import/Transp)	55.21
Dung, Straw, Brass (Free)	0.00
Earth & Clay	10.52
Reed Mats	5.51
Timber Beams & Battens	19.80
Sun-Bricks	19.37
1.2 Non-Local: (Hi-Import/Transp)	0.00
2.0 Labour	44.79
2.1 Skilled	21.88
2.2 Unskilled	22.92

II.A: TECHNOLOGY CHOICE CRITERIA : CASH - FLOW FROM CONSTRUCTION EXPENDITURES; SPATIALLY & BY INCOME GROUPS

Spatially	COEFFICIENTS of Distribution					DISTRIBUTION OF CONSTRUCTION EXPENDITURES (RS/100)							
	Ext. Dist.	Within District	By Income Group	Govt.	External District	Within District	By Income Group	Govt.					
v	x	z	aa	ac	ad	af	aj	ak	am	an	ap	aq	as
3.23	52.03	7.28	44.74	26.73	25.24	3.13	3.23	52.03	7.28	44.74	26.73	25.24	3.13
0.00	1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.71	0.47	0.24	0.22	0.48	0.03	1.65	3.91	2.59	1.32	1.21	2.65	0.17
0.07	0.33	0.09	0.83	0.71	0.21	0.43	1.39	18.42	1.78	16.44	14.06	4.16	2.57
0.01	0.99	0.15	0.85	0.32	0.68	0.02	0.19	19.17	2.91	16.46	5.20	13.17	0.39
0.00	1.00	0.50	0.50	0.00	1.00	0.00	0.00	44.79	10.94	33.85	0.00	44.79	0.00
0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	21.88	10.94	10.94	0.00	21.88	0.00
0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	22.92	0.00	22.92	0.00	22.92	0.00

III.A: TECHNOLOGY CHOICE CRITERIA: IMPACT ON SAVINGS

Spatially	DISTRIBUTION of Savings												
	NET	External District	Within District	By Income Group	Govt.								
v	x	z	aa	ac	ad	af	aj	ak	am	an	ap	aq	as
3.23	96.82	18.22	78.60	26.73	70.03	3.13	3.23	96.82	18.22	78.60	26.73	70.03	3.13
0.10	0.02	0.03	0.02	0.10	0.00	0.20	0.10	0.02	0.03	0.02	0.10	0.00	0.20
0.32	1.94	0.55	1.57	2.67	0.00	0.63	0.32	1.94	0.55	1.57	2.67	0.00	0.63
2.26	2.26	2.12	2.57	2.57	0.00	0.00	2.26	2.26	2.12	2.57	2.57	0.00	0.00

TECHNOLOGY CHOICE CRITERIA I: BASIC CRITERIA

Criteria	Description
1 Spatial Efficiency:	Internal Space/Built Area
2 Cost Effectiveness:	Internal Space/RS/100 (sf)
3 Space & Employment Achieved:	RS/sf of Internal Space (RS)
4 /RS 100 Expenditure:	Onsite Employment: Total (No)
5	Unskilled
6	Skilled
7	Mandays/sf of Internal Space (No)

Indigenous Construction Technology 1: Sun - Brick Walls, Timber Roof.  
 (Technical) MODEL OF CONSTRUCTION VARIABLES & THEIR EFFECT ON BASIC, COST-BENEFIT & SAVINGS CRITERIA

I.C: CONSTRUCTION ANALYSIS: BY INPUTS, Summary One.

INPUTS	QUANTITIES	COSTS (RS)	Total /100RS	Unit Total /100RS
d	e	f	g	h
TOTALS	Inputs	Inputs	4990	100.00
1.0 Materials	2258	55.21		
1.1 Local (Low-Import/Transp)	658	16.08	0.55	2258
Earth (cf)	91	2.24	0.75	362
Dung (cf)	6	0.14	Free	69
Clay (cf)	236	5.77	Free	1.68
Straw (lbs)	250	6.11	Free	0
Grass (sf)	250	6.11	Free	0
Reed Mat; Sarkanda (sf)	250	6.11	0.33	83
Sirfee (sf)	323	7.95	0.44	143
Accacia Beams:4*3*14 (cf)	2	0.05	225.00	450
Uncut Timber Required (cf)	7	0.18	0.00	0
Battens:2.5*3*6 (cf)	45	1.10	8.00	360
Uncut Timber Required (cf)	17	0.41	0.00	0
Sun - Bricks (#)	13203	322.80	0.05	792
1.2 Non-Local (Hr' Imprv/Transp)	0	0.00	0.00	0
2.0 Labour (Man Days)	85	2.07		1832
0.1 Skilled	22	0.55		495
0.2 Unskilled	62	1.53		1337

I.C: INPUTS: Summarised for Cost-Benefit Analysis

INPUTS	Cost-Benefit Analysis	Costs
d	e	f
TOTALS	Inputs	100.00
1.0 Materials	55.21	
1.1 Local: (Low-Import/Transp)	55.21	
Dung, Straw, Grass (Free)	0.00	
Earth & Clay	10.52	
Reed Mats	5.51	
Timber Beams & Battens	19.80	
Sun-Bricks	19.37	
1.2 Non-Local (Hr' Imprv/Transp)	0.00	
2.0 Labour	44.79	
2.1 Skilled	21.88	
2.2 Unskilled	22.92	

III.B: COST - BENEFIT ANALYSIS.

FINANCIAL ANALYSIS	(Using Market Prices)	(202)	(202)
d	e	f	g
TOTALS	100.00	90.91	83.33
1.0 Materials	55.21	50.19	46.00
1.1 Local: (Low-Import/Transp)	55.21	50.19	46.00
Dung, Straw, Grass (Free)	0.00	0.00	0.00
Earth & Clay	10.52	9.55	8.77
Reed Mats	5.51	5.01	4.59
Timber Beams & Battens	19.80	18.00	16.50
Sun-Bricks	19.37	17.61	16.14
1.2 Non-Local (Hr' Imprv/Transp)	0.00	0.00	0.00
2.0 Labour	44.79	40.72	37.33
2.1 Skilled	21.88	19.89	18.23
2.2 Unskilled	22.92	20.83	19.10

(Construction Costs-Expenditures Discounted Over One Year)

ADJUSTMENT FACTOR (AF)	(To Obtain Shadow Price)	12: ECONOMIC ANALYSIS	(Using Shadow Prices)	13: SOCIAL ANALYSIS	(Income Distribution)
d	e	f	g	h	i
TOTALS	Inputs	95.42	86.74	79.51	-4.58
1.0 Materials	55.21	50.19	46.00	39.51	
1.1 Local: (Low-Import/Transp)	55.21	50.19	46.00	39.51	
Dung, Straw, Grass (Free)	0.00	0.00	0.00	0.00	
Earth & Clay	10.52	9.55	8.77	8.77	
Reed Mats	5.51	5.01	4.59	4.59	
Timber Beams & Battens	19.80	18.00	16.50	16.50	
Sun-Bricks	19.37	17.61	16.14	16.14	
1.2 Non-Local (Hr' Imprv/Transp)	0.00	0.00	0.00	0.00	
2.0 Labour	44.79	40.72	37.33	35.51	
2.1 Skilled	21.88	19.89	18.23	18.23	
2.2 Unskilled	22.92	20.83	19.10	17.28	

III.B: TECHNOLOGY CHOICE CRITERIA: IMPACT ON SAVINGS

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA	1: Description	2: Value
d	e	f
1 Spatial Efficiency:	Internal Space/Built Area	0.75
2 Cost Effectiveness:	Internal Space/Rs100 (sf)	5.31
/Rs 100 Expenditure)	R/s/sf of Internal Space (Rs)	18.85
	Onsite Employment:Total(Md)	2.07
	Unskilled	1.53
3 Labour Productivity:	Man-days/sf of Internal Space(Md)	0.39

III.B: TECHNOLOGY CHOICE CRITERIA: IMPACT ON SAVINGS

SAVINGS DISTRIBUTION	1: Value	2: Value	3: Value
d	e	f	g
Income Distribution	-4.58	-4.58	0.00
Marginal Propensity to Save (INPUT > 0.20)	0.00	0.00	0.15
NET EFFECT ON SAVINGS	-4.58	4.58	0.00
NET EFFECT ON SAVINGS	0.00	0.00	0.00
NET EFFECT ON SAVINGS	0.00	0.00	0.00

IMPORTED CONSTRUCTION Technology 1: Fired - Brick Walls, Reinforced Concrete Roof.  
 Model of Construction Variables and their Effects on Basic, CASH - FLOW & Savings Criteria.

I.C: CONSTRUCTION ANALYSIS: BY INPUTS. Summary One.

INPUTS	QUANTITIES	COSTS (RS)	Total /100RS
d	f	g	h
TOTALS	20470	100.00	
1.0 Materials	15574	76	
1.1 Local (Low-Import/Transp)	6392	31	
Earth (cf)	168	0.82	
Sand (cf)	1949	9.52	
Mood Forms (17 days rent)	704	3.44	
Coal-Fired Bricks (#)	9482	46.32	
Coal-Fired Roof Tiles(#)	760	3.71	
Brick Ballast (cf)	31	0.15	
Bitumen (lbs)	89	0.43	
Polythene (sf)	261	1.28	
Aggregate (cf)	248	1.21	
Cement (cwt, 50kg, 1bag)	62	0.30	
Mild-Steel Bars 1/2" (kg)	310	1.51	
2.0 Labour (Man Days)	147	0.72	
0.1 Skilled	49	0.24	
0.2 Unskilled	99	0.48	

I.C.2) Summary Two

INPUTS	COSTS (RS/100)
o	p
TOTALS	97.43
1.0 Materials	73.51
1.1 Local (Low Import/Transp)	28.61
Earth	0.82
Sand	9.52
Formwork	3.44
Bricks, Tiles, Ballast	17.40
1.2 Non-Local (Hi-Import/Trsp)	44.91
Bitumen, Polythene	8.25
Aggregate	7.88
Cement	21.96
Steel Bars	6.81
2.0 Labour	23.92
2.1 Skilled	14.26
2.2 Unskilled	9.65

II.A: TECHNOLOGY CHOICE CRITERIA: CASH - FLOW FROM CONSTRUCTION EXPENDITURES

II.A: CASH - FLOW ANALYSIS: Spatially & by Income Groups.

Spatially Ext. Dist.	COEFFICIENTS of Distribution				By Income Group	Spatially External	DISTRIBUTION OF CONSTRUCTION EXPENDITURES (RS/100)																
	Within District	Urban	Rural	Govt.			Within District	Urban	Rural	Upper	Lower	Govt.											
v	w	x	y	z	aa	ab	ac	ad	ae	af	ag	ah	ai	aj	ak	al	am	an	ao	ap	aq	ar	
0.00	1.00	0.00	1.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.71	0.29	0.77	0.23	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.57	0.43	0.07	0.36	0.14	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.33	0.07	0.07	0.00	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.20	0.20	0.00	0.18	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.94	0.06	0.06	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.10	0.10	0.00	0.08	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.75	0.25	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

III.A: TECHNOLOGY CHOICE CRITERIA 3: IMPACT ON SAVINGS

NET	Spatially External	DISTRIBUTION OF SAVINGS				By Income Groups	Local
		Within District	Urban	Rural	Upper		
Input ==>	Input ==>	aa	ab	ac	ad	ae	af
50.67	49.33	26.27	23.07	17.23	32.10	1.21	0.24
0.10	0.02	0.03	0.02	0.10	0.00	0.00	0.20
5.07	0.39	0.79	0.46	1.72	0.00	0.00	0.24
6.05	6.05	6.05	1.25	1.72	0.00	0.00	0.24

Fig- Imported Construction Technology 1: Fired - Brick Walls, Reinforced Concrete Roof.  
(continued) MODEL OF CONSTRUCTION VARIABLES & THEIR EFFECT ON BASIC, COST-BENEFIT & SAVINGS CRITERIA

EFFECT OF DISCOUNTING & SHADOW PRICING ON COSTS, BENEFITS & INCOME DISTRIBUTION

I.C: CONSTRUCTION ANALYSIS: BY INPUTS. Summary One.

INPUTS	QUANTITIES	COSTS (RS)	/100RS
d	f	g	i
TOTALS	20470	100.00	100.00
1.0 Materials	15574	76	76.08
1.1 Local (Low-Import/Transp)	6382	31	31.18
Earth (cf)	168	0.82	13.78
Sand (cf)	487	4.00	17.40
Hood Forms (17 days rent)	704	3.44	44.91
Coal-Fired Bricks (#)	9482	0.32	8.25
Coal-Fired Roof Tiles(#)	760	0.55	7.88
Brick Ballast (cf)	31	3.50	21.96
1.2 Non - Local (Hr Import/Transp)	9192	45	6.81
Bitumin (lbs)	89	17.80	23.92
Polythene (sf)	261	0.40	14.26
Aggregate (cf)	248	6.50	14.26
Cement (cwt, 50kg, 1bag)	62	72.50	9.65
Mild-Steel Bars 1/2"0 (kg)	310	4.50	9.65
2.0 Labour (Man Days)	147	0.72	23.92
0.1 Skilled	49	0.24	14.26
0.2 Unskilled	99	0.48	9.65

I.C: INPUTS. Summarized For Cost-Benefit Analysis

Cost-Benefit Analysis	Costs	/RS100
o	p	r
TOTALS	100.00	100.00
1.0 Materials	76.08	76.08
1.1 Local: (Low Import/Transp)	31.18	31.18
Earth, Sand, Formwork	13.78	13.78
Bricks, Tiles, Ballast	17.40	17.40
1.2 Non-Local (Hr Import/Transp)	44.91	44.91
Bitumin, Polythene	8.25	8.25
Aggregate	7.88	7.88
Cement	21.96	21.96
Steel Bars	6.81	6.81
2.0 Labour	23.92	23.92
2.1 Skilled	14.26	14.26
2.2 Unskilled	9.65	9.65

I.I.B: COST - BENEFIT ANALYSES. Construction Costs Discounted Over One Year.

FINANCIAL ANALYSIS	ADJUSTMENT FACTOR(A/F)	ECONOMIC ANALYSIS	SOCIAL ANALYSIS
(Using Market Prices)	(For Shadow Price)	(Using Shadow Prices)	(Income Distribution)
(0Z)	(10Z)	(0Z)	(10Z)
v	v	ah	ai
TOTALS	100.00	90.91	83.33
1.0 Materials	69.17	63.40	55.21
1.1 Local: (Low Import/Transp)	28.34	25.98	25.26
Earth, Sand, Formwork	12.53	11.49	11.49
Bricks, Tiles, Ballast	15.81	14.50	13.77
1.2 Non-Local (Hr Import/Transp)	40.82	37.42	32.57
Bitumin, Polythene	7.50	6.87	6.87
Aggregate	7.17	6.57	6.57
Cement	19.96	18.30	13.18
Steel Bars	5.20	5.88	4.43
2.0 Labour	21.74	19.33	18.32
2.1 Skilled	12.97	11.89	11.89
2.2 Unskilled	8.78	8.05	7.02

I.II.B: TECHNOLOGY CHOICE CRITERIA 3b: IMPACT ON SAVINGS

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA	TECHNOLOGY CHOICE CRITERIA 2: A	TECHNOLOGY CHOICE CRITERIA 3a: IMPACT ON SAVINGS
Description	Internal Space/Built Area	Internal Space/RS100 (sf)
1 Spatial Efficiency:	0.83	1.17
2 Cost Effectiveness:	1.17	85.29
(Space & Employment Achieved)	RS/sf of Internal Space (RS)	0.72
/RS 100 Expenditure)	Unskilled	0.48
3 Labour Productivity:	Mandays/sf of Internal Space(Md)	0.61

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA	TECHNOLOGY CHOICE CRITERIA 2: A	TECHNOLOGY CHOICE CRITERIA 3a: IMPACT ON SAVINGS
Description	Internal Space/Built Area	Internal Space/RS100 (sf)
1 Spatial Efficiency:	0.83	1.17
2 Cost Effectiveness:	1.17	85.29
(Space & Employment Achieved)	RS/sf of Internal Space (RS)	0.72
/RS 100 Expenditure)	Unskilled	0.48
3 Labour Productivity:	Mandays/sf of Internal Space(Md)	0.61

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA	TECHNOLOGY CHOICE CRITERIA 2: A	TECHNOLOGY CHOICE CRITERIA 3a: IMPACT ON SAVINGS
Description	Internal Space/Built Area	Internal Space/RS100 (sf)
1 Spatial Efficiency:	0.83	1.17
2 Cost Effectiveness:	1.17	85.29
(Space & Employment Achieved)	RS/sf of Internal Space (RS)	0.72
/RS 100 Expenditure)	Unskilled	0.48
3 Labour Productivity:	Mandays/sf of Internal Space(Md)	0.61

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA	TECHNOLOGY CHOICE CRITERIA 2: A	TECHNOLOGY CHOICE CRITERIA 3a: IMPACT ON SAVINGS
Description	Internal Space/Built Area	Internal Space/RS100 (sf)
1 Spatial Efficiency:	0.83	1.17
2 Cost Effectiveness:	1.17	85.29
(Space & Employment Achieved)	RS/sf of Internal Space (RS)	0.72
/RS 100 Expenditure)	Unskilled	0.48
3 Labour Productivity:	Mandays/sf of Internal Space(Md)	0.61

Fig. SWITCHING FROM INDIGENOUS TO IMPORTED CONSTRUCTION TECHNOLOGIES.  
 (cnswhc12) From Sun-Brick Hall, Timber Roof Type to Fired Brick Hall, Reinforced Concrete Roof Type Technology  
 NET EFFECTS ON INCOME DISTRIBUTION, EMPLOYMENT, LABOUR PRODUCTIVITY, COSTS, & SAVINGS.  
 (Comparing Results of CASH - FLOW Analysis)

A: INCOME DISTRIBUTION	Through Cash - Flow from Construction Expenditures									
	Spatially			By Income Group			Local Govt			
Construction Technology Type	External District	Within District	Urban	Rural	Upper	Lower				
	c	d	e	f	g	h	i	j	k	l
13										
14	Indigenous (Sun-Brick Halls, Timber Roof)	3.23	96.82	18.22	78.60	26.73	70.03			3.13
15	Imported (Fired Brick Halls, RCC Roof)	50.67	49.33	26.27	23.07	17.23	32.10			1.21
16	NET INCOME DISTRIBUTION	47.44	-47.49	8.05	-55.53	-9.50	-37.93			-1.92
17	NET INCOME EFFECT		-0.05		-47.48		-47.43			-1.92
18										
19										
20										
21										
22										
23										
24										
25										
26	D: SAVINGS THROUGH:									
27										
28										
29										
30										
31										
32	Net Income Distribution	47.44	-47.49	8.05	-55.53	-9.50	-37.93			-1.92
33	Marginal Propensity to Save (Input =>)	0.10	0.02	0.03	0.02	0.10	0.00			0.20
34										
35	SAVINGS DISTRIBUTION	4.74	-0.85	0.24	-1.11	-0.95	0.00			-0.38
36	NET SAVINGS	3.89	3.89		-0.87		-0.95			-0.38
37										

B: SAVINGS/LOSSES THRU COST DIFFERENCES:	(Construction Costs)			C: EMPLOYMENT (Mths/RS100)		
	X	Y		Z	ab	ac
	Rs/sf	sf/RS100		Total Unskilled		
	s	u	v			
Indigenous	18.85	5.31		2.07	1.53	
Imported	85.47	1.17		0.72	0.48	
NET LOSSES(Rs, #s)	-66.62	-4.14		-1.35	-1.05	
Value/sf (Rs)		18.85				
Total Value of sf Lost (Rs)		-77.95				

D2: Construction Cost Differences	D3: Net Wages	
	Govt.	Low Y.
	Net Employment	Net Wages
	Mths/Day	Mths/Day
Marg. Prop. to Save	0.20	0.00
SAVINGS Effect		
From X) Rs/sf	-13.32	0.00
Y) sf/RS100	-15.59	0.00
NET SAVINGS EFFECT		
D1 + X) Rs/sf:	-9.43	3.89
D1 + Y) sf/RS100:	-11.70	3.89









I.A: PRODUCTION ANALYSIS- Summary One.

VARIABLES 1:	Inputs	Description
1 Capacity:Bricks/Load/Yr.:	400	400 K bricks/30 days/Load 9 loads/year 3600 K bricks
2 Output: Production Cycle:	6	6 loads/year. 2400 K bricks
3 Production Period	8	8 months, October to June, 5 year lease
4 Financing	0.372 CRF for	5 year loan at 25% interest

VARIABLES 2:	d	e	f	g	h	i	j	k	l	m	n	o	p
RECEIPTS (Benefits)	400	303	121200	727200	303.00	100.00							
EXPENDITURES (Costs)			118118	708710	295.30	97.46							
INCOME (Net Values)			3082	18490	7.70	2.54							

VARIABLES 3:	QUANTITIES	COSTS (RS)
1.0 Capital	1	67460
1.1 Plant	1	60000
1.2 Equipment (\$)	1	7460
2.0 Kiln Land (Ac.)	1.5	0.0038 0.0012
3.0 Materials	1	86332
3.1 Local Low Import	2	51792
3.2 Non-local	1	8524
4.1 Skilled/Up.Y.	2	0.17 0.06
4.2 Unskilled/Lo.Y	57	4.75 1.57
5.0 Miscellaneous	7	0.58 0.19
5.1 Taxes	7	467 2800
5.2 Interest	1394	11503

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA	1: Output	2: Profitability	3: Capital Productivity	4: Labour Productivity
1 Capacity:Bricks/Load/Yr.:	400	295.30	97.46	4.92
2 Output: Production Cycle:	6	7.70	2.54	1.62
3 Production Period	8	4.09	1.35	0.83
4 Financing	0.372 CRF for	0.83	0.86	1.62

TECHNOLOGY CHOICE CRITERIA 2.a: CASH-FLOW FROM MATERIALS' PURCHASES: Distribution of Receipts; Spatially and by Income Groups	1: Annualised Cash Flow	2: Spatially	3: Income Group	4: Income Group	5: Income Group	6: Income Group	7: Income Group	8: Income Group	9: Income Group	10: Income Group
1.0 Capital	1.35	0.40	0.60	0.20	0.40	0.20	0.40	0.00	0.00	0.00
1.1 Plant	0.83	0.50	0.50	0.10	0.25	0.25	0.00	0.00	0.00	0.00
1.2 Equipment	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.0 Kiln Land	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.0 Materials	71.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.1 Local Low Import	11.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.2 Non-local	59.51	0.80	0.20	0.00	0.10	0.10	0.01	0.00	0.00	0.00
4.1 Skilled/Up.Y.	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.2 Unskilled/Lo.Y	20.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.0 Miscellaneous	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.1 Taxes	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.2 Interest	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS	1: Spatially	2: External District	3: Within District	4: Upper District	5: Lower District	6: Local
1 Capacity:Bricks/Load/Yr.:	56.67	43.33	7.43	35.88	15.26	28.07
2 Output: Production Cycle:	0.1	0.02	0.03	0.02	0.10	0.00
3 Production Period	5.67	0.87	0.22	0.72	1.53	0.00
4 Financing	6.53	0.94	0.22	0.94	1.53	0.16

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS	1: Spatially	2: External District	3: Within District	4: Upper District	5: Lower District	6: Local
1 Capacity:Bricks/Load/Yr.:	56.67	43.33	7.43	35.88	15.26	28.07
2 Output: Production Cycle:	0.1	0.02	0.03	0.02	0.10	0.00
3 Production Period	5.67	0.87	0.22	0.72	1.53	0.00
4 Financing	6.53	0.94	0.22	0.94	1.53	0.16

Indigenous Production Technology 1: SAW-MILL for Timber Beams & BATTENS  
 (2a) Production Variables & Their Effects on CASH - FLOW, BASIC & SAVINGS CRITERIA.

1.1: PRODUCTION ANALYSIS: Summary One.

VARIABLES 1.		Unit	Description
1	Capacity/cf/unit/month	1875	1875 cf
2	Output: Production Period	1875	9 months
3	Production Period	1875	9 months, September to June
4	Financing	10:372	CRF for 5 year loan at 25% interest

  

VARIABLES 2.		Unit	PRICE (R\$)	QUANTITIES	COSTS(R\$)
			/cf	/unit	/month/year
1	RECEIPTS (cf)	1875	27750	249750	14.80
2	Battens: 8cf (#1=0.32cf)	1875	8	15000	135000
3	Fuelwood: 17cf (cf)	1275	10	12750	14750
4	EXPENDITURES			25243	237006
5	INCOME			1507	12744

  

VARIABLES 3.		Unit	PRICE (R\$)	QUANTITIES	COSTS(R\$)
			/cf	/unit	/month/year
1	Capital			22320	186
2	Plant: 1 room, 2 shelters			8000	67
3	Equipment (R\$)			14320	119
4	Electric Motor (20hp)			6000	
5	Saw, 31" dia.			8000	
6	Saw sharpener			320	
7	Land (Acres)			0.13	87
8	Materials			20005	180045
9	Local (Low Import)			19650	176550
10	Accacia (25cf, 25mnds)			250	18750
11	Tree=25cf+8cf(fitns-417cf fuel, 10yrs-old)			0	800
12	Electricity			0	100
13	Grease for Saw			0	355
14	Non-Local (Import/Transp)			0	355
15	Replace blade & belt			0	355
16	Labour (#s, Handys, R\$/md)			7	2.90
17	Skilled/first sawer			1	0.30
18	Unskilled/Lo. Y			6	2.60
19	Second sawer			1	0.30
20	Helper			1	0.30
21	Tree Cutters/transp. #s, R\$			4	2.00
22	Contractor: R\$2/cf/cut, transp				
23	Miscellaneous			515	4639
24	Taxes(R\$/year) Local Govt			89	800
25	Interest (R\$/year)			427	3839

TECHNOLOGY CHOICE CRITERIA 2.a: CASH - FLOW THROUGH MATERIALS' PURCHASES. (Distribution of Receipts)

11.1: CASH - FLOW ANALYSIS: Spatially and by Income Group

11.A.2) PRODUCTION ANALYSIS: Summary Two.		Annualised Cash Flow /R\$100	COEFFICIENTS of Distribution Spatially	Income Groups	2: DISTRIBUTION of Receipts (From Materials' Purchases)															
			Ext. Dist. Within District	Urban, Rural, Up, Y, Lo, Y, I	External District	Within District														
			aa	ab	ad	ae	af	ag	ah	aj	an	ao	ap	aq	ar	as	at	au	av	
1	RECEIPTS	100.00																		
2	EXPENDITURES	94.90																		
3	INCOME	5.10	10.25	0.75	10.37	0.37	10.37	0.37	10.00		3.26	96.74	2.93	93.76	77.81	18.88	46.76			
4	Capital	0.89									1.98	92.92	1.04	91.87	75.92	16.99	46.76			
5	Plant	0.32									1.28	3.83	1.89	1.89	1.89	1.89				
6	Equipment	0.57																		
7	Land	0.42																		
8	Materials	72.09									0.00	0.42	0.00	0.42	0.42	0.00	0.00			
9	Local (Low Import)	70.81									1.28	70.81	0.00	70.81	70.81	0.00	0.00			
10	Non-Local	1.28									0.00	0.00	0.00	0.00	0.00	0.00	0.00			
11	Labour	19.64									0.00	19.64	0.00	19.64	2.88	16.76	0.00			
12	Skilled/Up. Y.	2.88									0.00	2.88	0.00	2.88	2.88	0.00	0.00			
13	Unskilled/Lo. Y.	16.76									0.00	16.76	0.00	16.76	0.00	16.76	0.00			
14	Miscellaneous	1.86									0.00	1.86	0.98	0.87	1.75	0.11	0.32			
15	Taxes/Local Govt.	0.32									0.00	0.32	0.21	0.11	0.21	0.11	15.76			
16	Interest	1.54									0.00	1.54	0.77	0.77	1.54	0.00	0.00			

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

III.A: SAVINGS ANALYSIS		Spatially	External District	Within District	Urban	Rural	Upper Y.	Lower Y.
1	Distribution of Receipts	3.26	96.74	2.93	93.76	77.81	18.88	16.76
2	Marginal Propensity to Save	0.10	0.02	0.03	0.02	0.10	0.00	0.20
3	SAVINGS Distribution	0.33	1.93	0.09	1.88	7.78	0.00	3.35
4	SAVINGS TOTAL:	2.26	2.26		1.96	7.78		3.35



Indigenous Production Technology 1: SAW-MILL for TIMBER BEAMS & BATTENS  
 2) Production Variables & Their Effects on CASH - FLOW, BASIC & SAVINGS CRITERIA.

A: PRODUCTION ANALYSIS: Summary One.

VARIABLES 1	Unit	Description
1 Capacity:cf/unit/month	1875	1875 cf
2 Output: Production Period	1875	9 months
3 Production Period	9	9 months, September to June
4 Financing	10.372	CRF for 5 year loan at 25% interest

VARIABLES 2	QTY. cf	PRICE (\$)	MONTHLY COST (\$)	ANNUAL COST (\$)
RECEIPTS (cf) 1tree=50cf	1875	56621	491588	29.13 100.00
BEAMS:15cf/tree(\$)=3.05cf	184	4496	373463	703.13 75.97
FUELWOOD: 35cf (cf)	1313	10	13125	118125 10.00 24.03
EXPENDITURES			31868	287631 17.18 58.51
INCOME			22753	203957 11.95 41.49

INPUTS (EXPENDITURES)	QUANTITIES	COSTS(\$)
1.0.Capital	22320	186
1.1.Plant: 1 room, 2 shelters	8000	67
1.2.Equipment (\$5)	14320	119
Electric Motor (20hp)	6000	
Saw, 3'3" dia.	8000	
Saw sharpener	320	
2.0.Land (Acres)	0.13	87
3.0 Materials		
3.1 Local (Low Import)	38	0.02
Accacia Trees(50cf, 50mnds)	650	
(1tree=50cf=15c 18ftms.&		
35cf fuel, 18yrs. old)		
Electricity	0	0
Grease for Saw	0	0
3.2 Non-Local (Import/Transp)	0	0
Replace blade & belt	0	0
Labour (\$5/Handy/5/Rs/day)	7	2.90
14.1 Skilled/first sawer	1	0.30
14.2 Unskilled/L.o.Y	6	2.60
Second sawer	1	0.30
Helper	1	0.30
Tree Cutter/trimsp.\$5/Rs/cf	4	2.00
Contractor\$/cf/cdct,transp		
Miscellaneous		
Taxes(Rs/year) Local Govt.		
Interest(Rs/year)		

INPUTS (EXPENDITURES)	QUANTITIES	COSTS(\$)
1.0.Capital	22320	186
1.1.Plant: 1 room, 2 shelters	8000	67
1.2.Equipment (\$5)	14320	119
Electric Motor (20hp)	6000	
Saw, 3'3" dia.	8000	
Saw sharpener	320	
2.0.Land (Acres)	0.13	87
3.0 Materials		
3.1 Local (Low Import)	38	0.02
Accacia Trees(50cf, 50mnds)	650	
(1tree=50cf=15c 18ftms.&		
35cf fuel, 18yrs. old)		
Electricity	0	0
Grease for Saw	0	0
3.2 Non-Local (Import/Transp)	0	0
Replace blade & belt	0	0
Labour (\$5/Handy/5/Rs/day)	7	2.90
14.1 Skilled/first sawer	1	0.30
14.2 Unskilled/L.o.Y	6	2.60
Second sawer	1	0.30
Helper	1	0.30
Tree Cutter/trimsp.\$5/Rs/cf	4	2.00
Contractor\$/cf/cdct,transp		
Miscellaneous		
Taxes(Rs/year) Local Govt.		
Interest(Rs/year)		

TECHNOLOGY CHOICE CRITERIA 2: CASH - FLOW FROM MATERIALS' PURCHASES. (Distribution of Receipts)

PRODUCTION ANALYSIS: Summary Two	Annalised: Cash Flow	COEFFICIENTS of Distribution	DISTRIBUTION of Receipts (From Materials' Expenditures)
RECEIPTS	100.00	10.25 0.75 10.37 0.37 10.37 10.00	11.38 88.62 15.88 72.32 64.22 23.98 8.51
EXPENDITURES	58.51		1.01 57.50 0.53 56.97 48.87 8.63 8.5
INCOME	41.49		10.37 31.12 15.35 15.35 15.35 15.35 0.01

INPUTS (EXPENDITURES)	Annalised: Cash Flow	COEFFICIENTS of Distribution	DISTRIBUTION of Receipts (From Materials' Expenditures)
1.0.Capital	0.45		0.35 0.10 0.03 0.07 0.03 0.07 0.01
1.1.Plant	0.16		0.07 0.10 0.03 0.07 0.03 0.07 0.01
1.2.Equipment	0.29		0.29 0.00 0.00 0.00 0.00 0.00 0.01
2.0.Land	0.21		0.00 0.21 0.00 0.21 0.21 0.00 0.01
3.0 Materials	46.92		0.65 46.27 0.00 46.27 46.27 0.00 0.01
3.1 Local:Low Import	46.27		0.00 46.27 0.00 46.27 46.27 0.00 0.01
3.2 Non-Local	0.65		0.65 0.00 0.00 0.00 0.00 0.00 0.01
4.0 Labour	9.98		0.00 9.98 0.00 9.98 9.98 0.00 0.01
14.1 Skilled/Up.Y.	1.46		0.00 1.46 0.00 1.46 1.46 0.00 0.01
14.2 Unskilled/L.o.Y	8.51		0.00 8.51 0.00 8.51 8.51 0.00 0.01
5.0 Miscellaneous	0.94		0.00 0.94 0.50 0.44 0.99 0.05 0.01
Taxes:Local Govt.	0.16		0.00 0.16 0.11 0.05 0.11 0.05 0.01
Interest	0.78		0.00 0.78 0.39 0.39 0.78 0.00 0.01

TECHNOLOGY CHOICE CRITERIA 3: a: EFFECT ON SAVINGS	Spatially	By Income Groups
III.A: SAVINGS ANALYSIS		
Distribution of Receipts	11.38 88.62 15.88 72.32 64.22 23.98 8.51	
Marginal Propensity to Save	0.10 0.02 0.03 0.02 0.10 0.00 0.21	
SAVINGS Distribution	1.14 1.77 0.48 1.45 6.42 0.00 1.71	
SAVINGS TOTAL:	2.91 2.91 1.92 6.42 1.71	

1 Capacity:cf/unit/month	1875	1875 cf	50 cf/tree.5 Trees/day,
2 Output: Production Period	1875	9 months	1875 cf/year Sept. to June
3 Production Period	9	9 months	September to June
4 Financing	10:372	CRF for	5 year loan at 25% interest

VARIABLES 2.	QTY. cf	PRICE	(RS)	QTY. cf	PRICE	(RS)
A: RECEIPTS (cf) 1tree=50cf	1875	54621	491588	29.13	100.00	100.00
Beas:1Scf/tree(\$)=3.05cf	184	41496	373463	1703.13	75.97	225
Fuelwood: 35cf (cf)	1313	13125	118125	10.00	24.03	10
B: EXPENDITURES		31868	287631	17.18	58.51	
C: INCOME		22753	203957	11.95	41.49	
B: INPUTS (EXPENDITURES)						
VARIABLES 3.	QTY. cf	PRICE	(RS)	QTY. cf	PRICE	(RS)
11.0.Capital	22320	186	2232	0.13	0.45	
11.1.Plant: 1 room, 2 shelters	8000	67	800	0.05	0.16	
11.2.Equipment (#)	14320	119	1432	0.08	0.29	
Electric Motor (20hp)	5000	8000				
Saw, 37" dia.	8000	320				
Saw sharpener	8000	87	1040	0.06	0.21	
12.0.Land (Acres)	0.13	8000				
3.0 Materials	38	0.02	0.07	650		
3.1 Local (Low Import)				25630	230670	13.81
Accacia Trees(50cf,50mnds)				25275	227475	13.62
(1tree=50cf=5Scftbns.& 35cf fuel,18yrs.old)				24375	219375	13.00
Electricity	0	0	ERR	800	7200	0.43
Grease for Saw	0	0	ERR	100	900	0.19
3.2 Non-Local (Import/Transp)	0	0	0	355	3195	0.19
Replace Blade & belt	0	0	0	355	3195	0.19
4.0 Labour (\$s, Mandays, Rs/day)	7	2.90	0.40	5450	49050	2.91
4.1 Skilled/first sawer	1	0.30	0.04	800	7200	0.43
4.2 Unskilled/Lo. Y	6	2.60	0.36	4650	41850	2.48
Second sawer	17	500	4500	0.27	0.92	
Helper	1	0.30	0.13	400	3600	0.21
Tree Cutter/trmp.#s, Rs/cft	4	2.00	0.27	3750	33750	2.00
ContractRs2/cftcut,transp						
5.0 Miscellaneous				515	4639	0.27
Taxes(Rs/year) Local Govt.				89	800	0.05
Interest (Rs/year)				427	3839	0.23

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

1 Cost Minimization:	Production Cost/Unit Output	17.18	58.51
2 Profitability:	Net Return on Expenditures	11.95	41.49
3 Capital Productivity:	1) Capital Investment/Unit Output	0.13	0.43
	2) Capital Investment/Unit Employment(Md)	1.14	1.14
	Handays/Unit Output	2.90	0.40

TECHNOLOGY CHOICE CRITERIA 2.a: CASH - FLOW FROM MATERIALS' PURCHASES. (Distribution of Receipts)

II.A CASH - FLOW ANALYSIS: Spatially and by Income Group.

ANALYSIS: Summary Two.	COEFFICIENTS of Distribution					DISTRIBUTION of Receipts (From Materials' Expenditures)					
	Cash Flow	Spatially	Ext. Dist.	Urban Rur.	Upper Y. Lower Y.	Spatially	External District	Urban Rural	Upper Y. Lower Y.	Govt.	
A: RECEIPTS	100.00					11.38	88.62	15.88	72.32	64.22	23.98
B: EXPENDITURES	58.51					1.01	57.50	0.53	56.97	48.87	8.53
C: INCOME	41.49					10.37	31.12	15.35	15.35	15.35	15.35

II.B: INPUTS (EXPENDITURES)

11.0.Capital	0.45					0.36	0.10	0.03	0.07	0.03	0.07
11.1.Plant	0.16					0.07	0.10	0.03	0.07	0.03	0.07
11.2.Equipment	0.29					0.29	0.00	0.00	0.00	0.00	0.00
12.0.Land	0.21					0.00	0.21	0.00	0.21	0.21	0.00
3.0 Materials	46.92					0.65	46.27	0.00	46.27	46.27	0.00
3.1 Local:Low Import	46.27					0.00	46.27	0.00	46.27	46.27	0.00
3.2 Non-Local	0.65					0.65	0.00	0.00	0.00	0.00	0.00
4.0 Labour	9.98					0.00	9.98	0.00	9.98	1.46	8.51
4.1 Skilled/Up. Y.	1.46					0.00	1.46	0.00	1.46	1.46	0.00
4.2 Unskilled/Lo. Y	8.51					0.00	8.51	0.00	8.51	0.00	8.51
5.0 Miscellaneous	0.94					0.00	0.94	0.50	0.44	0.89	0.05
Taxes:Local Govt.	0.16					0.00	0.16	0.11	0.05	0.11	0.05
Interest	0.78					0.00	0.78	0.39	0.39	0.78	0.00

III.A: SAVINGS ANALYSIS

ANALYSIS: Summary Two.	COEFFICIENTS of Distribution					DISTRIBUTION of Receipts (From Materials' Expenditures)					
	Cash Flow	Spatially	Ext. Dist.	Urban Rur.	Upper Y. Lower Y.	Spatially	External District	Urban Rural	Upper Y. Lower Y.	Govt.	
Distribution of Receipts						11.38	88.62	15.88	72.32	64.22	23.98
Marginal Propensity to Save						0.10	0.02	0.03	0.02	0.10	0.00
SAVINGS Distribution						1.14	1.77	0.48	1.45	6.42	0.00
SAVINGS TOTAL:						2.91	2.91	1.92	1.92	6.42	1.70

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

ANALYSIS: Summary Two.	COEFFICIENTS of Distribution					DISTRIBUTION of Receipts (From Materials' Expenditures)					
	Cash Flow	Spatially	Ext. Dist.	Urban Rur.	Upper Y. Lower Y.	Spatially	External District	Urban Rural	Upper Y. Lower Y.	Govt.	
Distribution of Receipts						11.38	88.62	15.88	72.32	64.22	23.98
Marginal Propensity to Save						0.10	0.02	0.03	0.02	0.10	0.00
SAVINGS Distribution						1.14	1.77	0.48	1.45	6.42	0.00
SAVINGS TOTAL:						2.91	2.91	1.92	1.92	6.42	1.70

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

1 Cost Minimization:	Production Cost/Unit Output	17.18	58.51
2 Profitability:	Net Return on Expenditures	11.95	41.49
3 Capital Productivity:	1) Capital Investment/Unit Output	0.13	0.43
	2) Capital Investment/Unit Employment(Md)	1.14	1.14
	Handays/Unit Output	2.90	0.40



Fig. (aggreg1)

CASH-FLOW THROUGH PURCHASES OF AGGREGATE

9	MATERIALS' MERCHANT	PRICE	/cf	/truck	/Rs100	COEFFICIENTS OF DISTRIBUTION													
						Spatially					Income Groups								
10						Ext. Dst.	Within District	Govt.	Urb. Rur.	Up. Y. Lo. Y.	1	m	o	p	r	s	u		
11	d	f	/250cf	g	h														
12																			
13																			
14	A RECEIPTS	7		1750	100.00														
15	B EXPENDITURES			1445	82.57														
16	C INCOME			305	17.43														
17																			
18	INPUTS	COSTS (Rs)																	
19	(Expenditures)	/unit	/truck	/Rs100															
20			/250cf																
21																			
22	11.0 NON-LOCAL: Taxila			1400	80.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
23	11.1 Landowner. (Private/govt.)			25	1.43														
24	11.2 Aggregate Co.			375	21.43														
25	11.3 Materials' Agency			75	4.29														
26	11.4 Labour (to load:/truck)			25	1.43														
27	11.5 Trucker (/truck)			900	51.43														
28																			
29	12.0 LOCAL: Sahiwal			45	2.57														
30	12.1 Octroi Tax(/truck)			20	1.14	1.00	1.00	0.66	0.33	0.66	0.33	1.00							
31	12.2 Labour (to unload:/truck)			25	1.43	1.00	1.00	1.00	0.00	1.00	1.00	0.00							
32																			
33																			
34																			
35	Source: M. Butt. Materials' merchant. Sahiwal City.																		

TECHNOLOGY CHOICE CRITERIA 3.a:										EFFECT ON SAVINGS																
Spatially					Income Groups					Spatially					Income Groups											
External District					Within District					External District					Within District											
Urban					Rural					Urban					Rural											
Distribution of Receipts										80.00	20.00	19.61	0.38	18.18	1.81	1.14										
Marginal Propensity to Save										0.10	0.02	0.03	0.02	0.10	0.00	0.20										
SAVINGS Distribution										8.00	0.40	0.59	0.01	1.82	0.00	0.23										
SAVINGS TOTAL:										8.40	8.40	0.60	1.82	0.23												

Fig. (Cement)

CASH-FLOW THROUGH PURCHASES OF CEMENT

9	MATERIALS' MERCHANT	PRICE	/50kg bag	/truck	/Rs100	COEFFICIENTS of Distribution				DISTRIBUTION of Receipts									
						Spatially	Income Groups	Ext. Dist.	Within District	Spatially	Within District	Urban Rural	Upper Lower						
10						1	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
11			200bags																
12																			
13																			
14	A RECEIPTS	70.50	14100	100.00									93.62	6.38	6.21	0.18	5.86	0.52	0.50
15	B EXPENDITURES	66.60	13320	94.47									93.62	0.85	0.67	0.18	0.33	0.52	0.50
16	C INCOME	3.90	780	5.53									0.00	5.53	5.53	0.00	5.53	0.00	0.00
17																			
18	INPUTS																		
19	(Expenditures)																		
20																			
21																			
22	1.0 NON-LOCAL-Hyderabad	66.00	13200	93.62		1.00	0.00	0.00	0.00	0.00	0.00	0.00	93.62	0.00	0.00	0.00	0.00	0.00	0.00
23	1.1 Factory	51.00	10200	72.34															
24	1.2 Truck to Sahiwal	15.00	3000	21.28															
25																			
26	2.0 LOCAL	0.60	120	0.85										0.00	0.85	0.67	0.18	0.33	0.52
27	2.1 Labour to unload	0.25	50	0.35		0.00	1.00	0.50	0.00	1.00	0.00	0.00	0.00	0.35	0.18	0.18	0.00	0.35	0.00
28	2.2 Octroi Tax	0.35	70	0.50		0.00	1.00	0.00	0.66	0.33	1.00	0.00	0.00	0.50	0.50	0.00	0.33	0.16	0.50

Source: Yahya Khan, Cement Agency Dwner, Sahiwal City

TECHNOLOGY CHOICE CRITERIA 3.a:	EFFECT ON SAVINGS			
	Spatially	By Income Groups	Govt.	Urban Rural
Distribution of Receipts	93.62	6.38	6.21	0.18
Marginal Propensity to Save	0.10	0.02	0.03	0.02
SAVINGS Distribution	9.36	0.13	0.19	0.00
SAVINGS TOTAL:	9.49	9.49	0.19	0.19

Fig. (astrods1)

CASH-FLOW THROUGH PURCHASES OF STEEL RODS

III.A: CASH - FLOW THROUGH MATERIALS' PURCHASES. (Distribution of Receipts)											
1: COEFFICIENTS of Distribution					12: DISTRIBUTION of Receipts						
Spatially		Income Groups			Spatially		By Income Groups				
Ext. Dist.	Within District	Govt.	Urb.	Rur.	Urban	Rural	Upper	Lower	Govt.		
1	2	3	4	5	6	7	8	9	10		
9	MATERIALS' MERCHANT	PRICE	/kg	/truck	/Rs100						
10				/10tons							
11											
12											
13											
14	A RECEIPTS	4.5	45000	100.00	91.33	8.67	8.67	0.00	8.39	0.27	0.16
15	B EXPENDITURES		41270	91.71	91.33	0.38	0.38	0.00	0.10	0.27	0.16
16	C INCOME		3730	8.29	0.00	8.29	8.29	0.00	8.29	0.00	0.00
17											
18	INPUTS	COSTS (RS)									
19	(Expenditures)	/unit	/truck	/Rs100							
20			/10tons								
21											
22	NON-LOCAL (Lahore)		41100	91.33	11.00	0.00	0.00	0.00	0.00	0.00	0.00
23	1.1 Steel Merchant (/kg)	4.0	40000	88.89							
24	1.2 Trucker (/ton)	100	1000	2.22							
25	1.3 Labour (to load:/ton)	10	100	0.22							
26											
27	2.0 LOCAL (Sahiwal)		170	0.38							
28	2.1 Octroi Tax(/truck)		70	0.16	0.00	1.00	1.00	0.00	0.66	0.33	1.00
29	2.2 Labour (to unload:/ton)	10	100	0.22	0.00	1.00	1.00	0.00	1.00	1.00	0.00
30											
31											
32											
33	Source: Itikhar Haq, Rods, Girder Seller, Sahiwal City										

12: TECHNOLOGY CHOICE CRITERIA 3:

EFFECT ON SAVINGS

		Spatially		By Income Groups				
		External	Within District	Urban	Rural	Upper	Lower	
Distribution of Receipts		91.33	8.67	8.67	0.00	8.39	0.27	0.16
Marginal Propensity to Save		0.10	0.02	0.02	0.01	0.10	0.00	0.20
SAVINGS Distribution		9.31	0.17	0.17	0.00	0.84	0.00	0.03
SAVINGS TOTAL:		9.31	0.17	0.17	0.00	0.84	0.00	0.03

Fig. (girdler 1)

CASH-FLOW THROUGH PURCHASES OF STEEL GIRDER

Line No.	Description	PRICE /truck	/10tons	/Rs100	COEFFICIENTS of Distribution				DISTRIBUTION of Receipts										
					Spatially	Income Groups	Ext. Dist.	Urb. Rur.	Spatially	Income Groups	UrbanRural	Upper Lower							
9	MATERIALS' MERCHANT	19.50	55714	100.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	EXPENDITURES	18.86	53897	96.74	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	INCOME	0.64	1817	3.26	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	INPUTS																		
13	(Expenditures)																		
14	NON-LOCAL (Lahore)	18.82	53757	96.49	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Steel Merchant	18.50	52857	94.87															
16	Truck to Sahiwal	0.28	800	1.44															
17	Labour (load:Rs70/truck)	0.04	100	0.18															
18	LOCAL (Sahiwal)	0.05	140	0.25															
19	Octroi Tax(/truck)	0.02	70	0.13	0.00	1.00	0.66	0.33	0.66	0.33	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	Labour (to unload:/ton)	0.02	70	0.13	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28																			
29																			
30																			
31																			
32																			
33	Source: Itfikhah Haq, Rods, Girdler Seller, Sahiwal City																		
34	Ahmad Iron Store, Pakpattan																		
35																			

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

	Spatially	Income Groups	ExternalDistrict	Within District	UrbanRural	Upper Lower
Distribution of Receipts	96.49	3.51	13.47	0.04	3.34	0.17
Marginal Propensity to Save	0.10	0.02	10.03	0.02	0.10	0.20
SAVINGS Distribution	9.65	0.07	10.10	.00	0.33	0.00
SAVINGS TOTAL:	9.72		0.10		0.33	0.03