VARIABLES / STAGES & SPECIFICATIONS	QUANTITY	MATERIALS					+	LABOUR						=	TOTAL		RATE (Rs/100sf)	
	sf,cf,kg	Type	Quantity /Unit	Total	Cost /Unit	(Rs) Total		Type	Qty. (Man Days) #/100	Total	/ 2Sk., 2 6 Unsk. 6		Cost (Rs) Mday	Total	Mat+Lab	Labour	Mat.+Lab
c d	‡100 Input \/	Constant	i	k	Input \/	n		Constant	q	s	t	u	Input \/	x	z	L ab	M+L ac
CRITERIA ===> TOTALS	2.17					15595		Total		147	41		4895	20490	2256	9443	
% TOTALS	(sf)					76.11		Unskilled		99	100.00		23.89	100.00			
1.0 FOUNDATION Sub-Total	42.06					3259				25.0	5.6		673	3932	16	93	
& FOOTINGS: % Total	(cf)					15.90				16.92	13.75		3.29	19.19			
1.1 Excavation 2'6"‡2'6".	3.90							Unskilled	1.05	4.1	0.7		20 82	82	210	210	
(17.1-5,32.W2)																	
1.2 Cement concrete bed	1.17	Cement(cwt/%cf)	4.50	5	72.50	382		Skilled	0.25	0.3	0.1		60 18				
9"‡2'6". Cem:Snd:Agg.	1.17	Sand(cf/%cf)	39.00	46	4.00	183		Unskilled	5.50	6.4	1.1		20 129				
1:7:20.(20.1,52.w4)	1.17	Aggregate(cf/%cf)	111	130	6.50	844		sub-total		6.7	1.2		146	1555	125	1329	
		sub-total				1408											
1.3 Footings 9" thick of	1.89	Bricks(#/%cf)	1350	2552	0.33	842		Skilled	2.00	3.8	1.9		60 227				
fired-bricks in cem:snd.	1.89	Cement(cwt/%cf)	3.00	6	72.50	411		Unskilled	4.80	9.1	1.5		20 181				
mortar 1:7 upto flr.lvl.	1.89	Sand(cf/%cf)	26.50	50	4.00	200		sub-total		12.9	3.4		408	1862	216	985	
(21.1,64,w12)		sub-total				1453											
1.4 Damp proof course	0.44	Cement(cwt/%sf)	2.25	1	72.50	72		Skilled	0.65	0.3	0.1		60 17				
(d.p.c.) 1:2:4. 1.5"	0.44	Sand(cf/%sf)	5.50	2	4.00	10		Unskilled	2.25	1.0	0.2		20 20				
thick w/ 2 coats hot	0.44	Bitumin(lbs/%sf)	34.00	15	17.80	266		sub-total		1.3	0.3		37	434	84	986	
bitumin & polythene	0.44	Aggregate	11.00	5	6.50	31											
sheet .5 gauge.	(sf)	(cf/%sf)															
(na,59,w80)	0.44	Polythene(sf/%sf)	100	44	0.40	18											
		sub-total				397											
2.0 WALLS Sub-Total	4.92					4028				40.7	11.0		1314	5342	267	1086	
% Total	(cf)					19.66				27.6	26.8		6.41	26.07			
2.1 Fired bricks 9" thick in	4.92	Bricks(#/%cf)	1350	6642	0.33	2192		Skilled	2.50	12.3	6.2		60 738				
cem.snd. mortar 1:7	4.92	Cement(cwt/%cf)	3	15	72.50	1070		Unskilled	5.58	27.5	4.6		20 549				
(21.1,64,w12)	4.92	Sand(cf/%cf)	26.50	130	4.00	522		sub-total		39.8	10.7		1287	5071	262	1031	
		sub-total				3783											
2.2 6 Lintels of reinforced	0.10	Cement(cwt/%cf)	17.60	2	72.50	128		Skilled	1.00	0.1	0.1		60 6				
cement concrete (r.c.c.)	0.10	Sand(cf/%cf)	44.00	4	4.00	18		Unskilled	6.50	0.7	0.1		20 13				
cem.snd.agg. 1:2:4. w/ 2	0.10	Aggregate(cf/%cf)	88.00	9	6.50	57		Skilled/50kg	0.50	0.1	0.1		60 6				
ms bars (20.4,52,W4)	0.10	ms bars 3/8"(kg/%kg)	100	10	4.25	43		Unskilled "	0.50	0.1	.0		20 2				
	0.10	sub-total				245		sub-total		1.0	0.23		27	272	270	2719	
3.0 ROOF Sub-Total	0.91					5998				36.1	11.5		1386	7383	1523	8114	
% Total	(cf)					29.27				24.5	28.3		6.76	36.03			
3.1 R.C.C. slab 4.5" thick.	0.91	Wood Formwork:Rented															
a) preparing surface for	2.50	1:Columns;Rs2/day/17days	6	6	34.00	204		Labour for Formwork Only:									
r.c.c. incl. formwork of	(sf)	2:Beams;Rs2/day/17days	2	2	34.00	68		Skilled		2.00	1.0		60 120				
wood supports,brick,		3:Battens;Rs.5/day/17days	39	39	8.50	332		Unskilled		6.00	1.0		20 120				
earth, & sand under-		Bricks;1152w/288damaged	288	288	0.33	95		sub-total		8.00	2.0		240	/%sf	96	423	
surfacing, 14 days in		Earth;1.5"thick(cf)	35	35	0.55	19		Formwork:Materials+Labour=					1058				
place.		Sand;negligable						%/Total					5				
		Carriage				100											
		sub-total				818											
b) laying slabs incl.	0.91	Cement(cwt/%cf)	17.60	16	72.50	1161		Labour for formwork+laying slab:									
pouring,compacting, curing	0.91	Sand(cf/%cf)	44.00	40	4.00	160		Skilled	12.00	10.9	5.5		60 654				
rendering. Cem:snd:agg:	0.91	Aggregate(cf/%cf)	88.00	80	6.50	521		Unskilled	13.30	12.1	2.0		20 242				
1:2:4:(20.4,52.w4)	(cf)	sub-total				1842		sub-total		23.0	7.5		896	3556	985	3907	
3.2 Fabricating mild steel	3.00	M.S.Bars1/2"0(kg/%kg)	100	300	4.50	1350		Skilled	0.50	3.0	1.5		60 180				
(m.s.) reinforcing bars;	0.06	Binding wire(lbs/cwt)	0.25	0	?	0		Unskilled	0.50	3.0	0.5		20 60				
cutting, bending,		sub-total				1350		sub-total		6.0	2.0		240	1590	80	530	
laying, jointing &																	
fastening plus cost of																	
bending wire, steel																	
wastage & rust removal.																	
(851,55,w5)																	
3.3 Cement slab coated w/ 34	2.17	Cement(cwt/%sf)	0.50	1	72.50	79		Skilled	1.25	2.7	1.4		60 163				
lbs. bitumin, sand	2.17	Sand(cf/%sf)	3.00	7	4.00	26		Unskilled	2.00	4.3	0.7		20 87				
blended, & polythene	2.17	Earth(cf/%sf)	55.00	119	0.55	66		sub-total		7.1	2.1		250	2238	115	1031	
sheet covered w/ 4"	2.17	Tiles(#/%sf)	350	760	0.55	418											
earth & 1" mud plaster	2.17	Bitumin(lbs/%sf)	34.00	74	17.80	1313											
w/out straw, finished w/	2.17	Polythene (sf/%sf)	100	217	0.40	87											
fired clay tiles	(sf)	sub-total				1988											
9"‡4.5"‡2" grouted w/																	
cem.snd. mortar 1:3.																	
(23.1,78,w25)																	
4.0 FLOOR Total	2.17					1366				10.8	2.0		244	1610	112	742	
% Total	(sf)					6.67				7.3	5.0		1.19	7.86			
4.1 Earth bed, moistened &	2.17	Earth(cf/%sf)	70.00	152	0.55	84		Skilled	0.13	0.3	0.1		60 17				
rammed to 6" thickness	2.17							Unskilled	1.25	2.7	0.5		20 54				
(24.1,87,w20)	2.17							sub-total		3.0	0.6		71	155	33	71	
4.2 Sand filling of 3	1.17	Sand(cf/%cf)	130	152	4.00	608		Skilled	0.13	0.2	0.1		60 9				
layers, each 3" thick	1.17							Unskilled	4.00	4.7	0.8		20 94				
compacted after	1.17							sub-total		4.8	0.9		103	711	88	608	
saturation down to 2",																	
totalling 6"(24.2,87,w4																	
1.1.1)																	
4.3 Brick ballast, 2" gauge	0.28	Brick ballast	110	31	3.50	108		Unskilled	3.00	0.8	0.1		20 17	125	60	445	
dry rammed to 1.5"layer	(cf)	(cf/%cf)															
(20.1,51,w4)																	
4.4 Cement concrete bed,	0.28	Cement(cwt/%cf)	17.60	5	72.50	357		Skilled	1.00	0.3	0.1		60 17				
1.5" w/cem:snd:agg:	0.28	Sand(cf/%cf)	44.00	12	4.00	49		Unskilled	6.50	1.8	0.3		20 36				
1:2:4:(20.1,52,w4)	0.28	Aggregate(cf/%cf)	88.00	25	6.50	160		sub-total		2.1	0.4		53	620	190	2214	
		sub-total				567											
5.0 RENDERS Total	16.40					944				35.0	10.7		1279	2222	78	136	
% Total	(sf)					4.61				23.7	26.1		6.24	10.85			
5.1 Cement pointing in	8.70	Cement(cwt/%sf)	0.72	6	72.50	454		Skilled	1.00	8.7	4.4		60 522				
struck joints on walls	8.70	Sand(cf/%sf)	1.80	16	4.00	63		Unskilled	1.25	10.9	1.8		20 218				
exterior. Cem:snd. 1:2.	8.70	sub-total				517		sub-total		19.6	6.2		740	1256	85	144	
(25.8,99.w33)																	
5.2 Cement plaster .5" thick	5.53	Cement(cwt/%sf)	0.53	3	72.50	212		Skilled	0.75	4.1	2.1		60 249				
on walls interior.	5.53	Sand(cf/%sf)	4.00	22	4.00	88		Unskilled	1.25	6.9	1.2		20 138				

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g. I.B: CONSTRUCTION & MAINTENANCE PATTERNS (Over 20 years) Indigenous Construction Technology 1: Sun - Brick Walls, Timber Roof
(tdtch124)

1: Maintenance Patterns & Costs; BY TYPE OF MAINTENANCE REQUIRED

VARIABLES / MAINTENANCE REQUIRED	YEARS: bc Input	Constr. 0 bd Outputs	Maintenance ==> 1 bf	2 bg	3 bh	4 bi	5 bj	6 bk	7 bl	8 bm	9 bn	10 bo	11 bp	12 bq	13 br	14 bs	15 bt	16 bu	17 bv	18 bw	19 bx	20 by	TOTALS ca
TOTALS (Rs)		4092	380	380	546	380	380	546	380	380	380	1353	380	380	546	380	380	546	380	380	380	2159	11015
	Area Z Repair																						
1.0 Year 0: Construction	0.00	4092																					
2.0 Yearly: Re-render External Walls, Floor & Roof	1.00		380	380		380	380		380	380	380		380	380		380	380		380	380	380		5318
3.0 3 Yearly: Re-render External, Internal Walls, Floor, Roof	1.00				546			546				546			546			546				546	3277
4.0 10 Yearly: Rebuild 25Z of Walls, Roof & Floor	0.25											807											807
5.0 20 Yearly: Rebuild 50Z of Walls, Roof & Floor	0.50																					1613	1613

2:

INPUTS / YEARS:	Construction /Rs100	Total 0	Maintenance ==> 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	MAINTENANCE TOTAL ca	MAINTENANCE /Rs100 On Mnt. cb	CST.+MNT. /Rs100 cd		CONSTRUCTION + MAINTENANCE 1: FINANCIAL ANALYSIS (0Z) ci	(10Z) cj	(20Z) ck
TOTALS (Rs)	100.00	4090	381	381	544	381	381	544	381	381	381	1350	381	381	544	381	381	544	381	381	381	2157	11020	100.00	100.00	===>	15110	8270	6322
1.0 Materials	55.21	2258	61	61	90	61	61	90	61	61	61	591	61	61	90	61	61	90	61	61	61	1091	2901	26.33	34.14		5159	3190	2700
1.1 Local:(low import/transp)	55.21	2258	61	61	90	61	61	90	61	61	61	591	61	61	90	61	61	90	61	61	61	1091	2901	26.33	34.14		5159	3190	2700
Dung, Straw, Grass.	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00		0	0	0
Earth & Clay	10.52	430	61	61	90	61	61	90	61	61	61	172	61	61	90	61	61	90	61	61	61	253	1643	14.91	13.72		2074	1076	782
Reed Mats	5.51	226										57										114	171	1.55	2.62	===>	396	264	238
Timber Beams & Battens	19.80	810										203										405	608	5.51	9.38		1418	948	853
Sun-Bricks	19.37	792										160										320	479	4.35	8.41		1271	901	826
1.2 Non-Local:(high import/transp	0.00	0																					0	0.00	0.00		0	0	0
2.0 Labour	44.79	1832	320	320	454	320	320	454	320	320	320	760	320	320	454	320	320	454	320	320	320	1065	8119	73.67	65.86		9951	5080	3623
2.1 Skilled	21.88	895	160	160	220	160	160	220	160	160	160	372	160	160	220	160	160	220	160	160	160	523	4019	36.47	32.52		4914	2504	1782
2.2 Unskilled	22.92	937	160	160	234	160	160	234	160	160	160	388	160	160	234	160	160	234	160	160	160	542	4100	37.20	33.34		5037	2576	1840

I 2.2.

Fig. I.B: CONSTRUCTION & MAINTENANCE PATTERNS, COSTS & BENEFITS (Over 20 Years) Imported Construction Technology 1: Fired - Brick Walls, Reinforced Concrete Roof
(mdtch124)

1: Maintenance Patterns & Costs; BY TYPE OF MAINTENANCE REQUIRED

VARIABLES / YEARS ===> / MAINTENANCE REQUIRED	Input	Constr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTALS
		0																					
		bc	bd	be	bf	bg	bh	bi	bj	bk	bl	bm	bn	bo	bp	bq	br	bs	bt	bu	bv	bw	by
TOTALS(Rs)	\/	20398	0	0	0	0	619	0	0	0	0	1676	0	0	0	0	619	0	0	0	0	2210	5125
	Area (Z)																						
	Repair																						
1.0 Year 0: Construction	0.00	20398																					
2.0 5 yearly:																							
2.1 Re-render 33Z of Ext. Wall	0.33						415					415					415					415	1658
2.2 Re-concrete 33Z of Floor	0.33						205					205					205					205	818
3.0 10 yearly:																							0
3.1 Re-render 33Z of Int. Wall	0.33											319										319	638
3.2 Repair 10Z of Roof	0.10											738										738	1477
4.0 20 yearly:																							0
4.1 Repair 10Z of wall	0.10																					534	534

2: Maintenance Patterns and Costs; BY INPUTS (In TOTAL VALUES of Construction Costs/Expenditures

INPUTS / YEARS:==>	Construction /Rs100	Maintenance ===> Total	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	MAINTENANCE TOTAL	/Rs100 On Maint	CST.+MNT /Rs100		1: FINANCIAL ANALYSIS (0Z)	(10Z)	(20Z)
																								by	ca	cd		cg	ch	ci
TOTALS (Rs)	100.00	20398						619					1676					619					2210	5125	100.00	100.00	====>	25523	21906	21015
1.0 Materials	76.00	15503						358					1098					358					1501	3314	64.67	73.73		18817	16457	15886
1.1 Local:(low import/transp)	31.28	6380						37					222					37					495	791	15	28.10				
Earth, sand, formwork	13.83	2821						37					180					37					234	489	9.53	12.97		3309	2957	2873
Coal-FiredBricks,Tiles,Bllst	17.45	3560											42										261	303	5.91	15.13		3862	3614	3573
1.2 Non-Local:(high imp./transp)	44.72	9122						321					876					321					1006	2523	49.23	45.63		11645	9885	9440
Bitumin, Polythene	8.26	1684											140										140	280	5.46	7.69	====>	1964	1759	1710
Aggregate	7.91	1613						53					105					53					111	321	6.27	7.58		1935	1716	1658
Cement	21.72	4430						268					496					268					616	1648	32.15	23.81		6077	4943	4651
Steel bars	6.84	1395											135										139	274	5.35	6.54		1669	1468	1420
2.0 Labour	24.00	4895						262					578					262					709	1811	35.33	26.27		6706	5449	5129
2.1 Skilled	14.31	2920						178					392					178					467	1214	23.69	16.20		4134	3293	3078
2.2 Unskilled	9.69	1976						84					186					84					243	596	11.64	10.08		2572	2156	2051

Construction + Maintenance

I 3·1.

Fig. INDIGENOUS CONSTRUCTION Technology 1: Sun - Brick Walls, Timber Roof.
(tdtk2a Model of Variables & Effects on Basic, CASH - FLOW, & Savings Criteria

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

VARIABLES	QUANTITIES Total INPUTS	/100Rs	COSTS (Rs) /Unit INPUTS	Total	/100Rs
c d	\/ g		\/	k	L
TOTAL EXPENDITURES				4499	100.00
Materials + Labour COSTS				4090	90.91
Contractor's PROFIT (%of M+L)			10.00	409	9.09
	\/		\/		
1.0 MATERIALS				2258	50.19
1.1 Local (Low-import/Transp)				2258	50.19
Earth (cf)	658	16.08	0.55	362	8.04
Clay (cf)	91	2.24	0.75	69	1.52
Dung (cf)	6	0.14	Free	0	0.00
Straw (lbs)	236	5.77	Free	0	0.00
Grass (sf)	250	6.11	Free	0	0.00
Reed Mat; Sarkanda (sf)	250	6.11	0.33	83	1.83
Sirkee (sf)	325	7.95	0.44	143	3.18
Accacia Beams:4"*8"*14'(#)	2	0.05	225.00	450	10.00
Uncut Timber Required (cf)	7	0.18	0.00	0	0.00
" Battens:2.5"*3"*6'(#)	45	1.10	8.00	360	8.00
Uncut Timber Required (cf)	17	0.41	0.00	0	0.00
Sun - Bricks (#)	13203	322.80	0.06	792	17.61
1.2 Non-Local(Hi'Import/Transp)	0	0.00	0.00	0	0.00
2.0 LABOUR (Man Days)	85	2.07		1832	40.72
0.1 Skilled	22	0.55	40.00	895	19.89
0.2 Unskilled	62	1.53	15.00	937	20.83

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

p q	Costs /Rs100 s
TOTALS	100.00
Mat. + Lab. EXPENDITURES	90.91
Contractor's PROFIT	9.09
1.0 Materials	50.19
1.1 Local:(lo'Import/Transp)	50.19
Dung,Straw,Grass(Free)	0.00
Earth & Clay	9.56
Reed Mats	5.01
Timber Beams & Battens	18.00
Sun-Bricks	17.61
1.2 Non-Local:(hi'Imprt/Trnsp)	0.00
2.0 Labour	40.72
2.1 Skilled	19.89
2.2 Unskilled	20.83

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

1: COEFFICIENTS of Distribution

Spatially Ext.	Dst.	Within District Urb.	Rur.	By Income Group Up Y	Lo Y	Local govt.
w	x	z	INPUTS\/	ac	ad	af
0.00	1.00	0.00	1.00	0.50	0.50	0.00
0.00	1.00	0.00	1.00	0.50	0.50	0.00
0.00	1.00	0.00	1.00	0.50	0.50	0.00
0.30	0.71	0.47	0.24	0.22	0.48	0.03
0.02	0.98	0.12	0.86	0.74	0.24	0.01
0.01	0.99	0.15	0.85	0.32	0.68	0.02
0.00	1.00	0.50	0.50	0.00	1.00	0.00
0.00	1.00	0.00	1.00	0.00	1.00	0.00

2: DISTRIBUTION OF CONSTRUCTION EXPENDITURES (/Rs100)

Spatially External District		Within District Urban	Rural	By Income Groups Up Y.	Low Y.	Local Govt.
aj	ak	am	an	ap	aq	as
2.04	98.01	17.10	81.08	29.39	68.75	0.68
2.04	88.92	17.10	71.99	24.84	64.20	0.68
0.00	9.09	0.00	9.09	4.55	4.55	0.00
2.04	48.20	7.16	41.22	24.84	23.48	0.68
2.04	48.20	7.16	41.22	24.84	23.48	0.68
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	9.56	0.00	9.56	4.78	4.78	0.00
1.50	3.56	2.36	1.20	1.10	2.41	0.15
0.36	17.64	2.16	15.48	13.32	4.32	0.18
0.18	17.43	2.64	14.97	5.63	11.97	0.35
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	40.72	9.95	30.78	0.00	40.72	0.00
0.00	19.89	9.95	9.95	0.00	19.89	0.00
0.00	20.83	0.00	20.83	0.00	20.83	0.00

TECHNOLOGY CHOICE CRITERIA I: BASIC CRITERIA

Criteria	Description	Value
1 Spatial Efficiency:	Internal Space/Built Area	0.75
2 Cost Effectiveness:	1) Internal Space/Rs100 (sf)	4.82
(Space & Employment Achieved /Rs 100 Expenditure)	Rs/sf of Internal Space (Rs)	20.73
	2) Onsite Employment:Total(Md)	2.07
	" " " Unskilled	1.53
3 Labour Productivity:	Mandays/sf of Internal Space(Md	0.39

TECHNOLOGY CHOICE CRITERIA 3.a: IMPACT ON SAVINGS

III.A: SAVINGS ANALYSIS

	NET TOTAL	Distribution of Savings Spatially External District	Within District Urban	Rural	By Income Groups Up Y	Low Y.	Govt.
Distribution of Expenditures		2.04	88.92	71.99	24.84	64.20	0.68
Marginal Propensity to Save	{INPUT==>	0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS DISTRIBUTION		0.20	1.78	0.51	1.44	2.48	0.00	0.14
SAVINGS TOTAL	1.98		1.98		1.95		2.48	

I 3.2

Fig. IMPORTED CONSTRUCTION Technology 1: Fired - Brick Walls, Reinforced Concrete Roof.
Model of Construction Variables & their Effects on Basic, CASH - FLOW & Savings Criteria.
(mdtkim2)

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

	INPUTS	QUANTITIES Total Input	/100Rs g	COSTS (Rs) /Unit Input	Total j	/100Rs k
	c d					
16	TOTAL COSTS	\/		\/	22517	100
17						
18	Mat.+Lab. EXPENDITURES				20470	91
19	Contractor PROFIT(%of M+L)			10.00	2047	9
20						
21	1.0 MATERIALS	\/			15574	69
22	1.1 Local (Low-import/Transp)				6382	28
23	Earth (cf)	306	1.50	0.55	168	0.75
24	Sand (cf)	487	2.38	4.00	1949	8.65
25	Wood Forms (17 days rent)				704	3.13
26	Coal-Fired Bricks (#)	9482	46.32	0.32	3034	13.48
27	Coal-Fired Roof Tiles(#)	760	3.71	0.55	418	1.86
28	Brick Ballast (cf)	31	0.15	3.50	109	0.48
29	1.2 Non - Local (Hi'Import/Transp				9192	41
30	Bitumin (lbs)	89	0.43	17.80	1584	7.04
31	Polythene (sf)	261	1.28	0.40	104	0.46
32	Aggregate (cf)	248	1.21	6.50	1613	7.17
33	Cement (cwt,50kg,1bag)	62	0.30	72.50	4495	19.96
34	Mild-Steel Bars 1/2"0 (kg)	310	1.51	4.50	1395	6.20
35						
36	2.0 LABOUR (Man Days)	147	0.72		4896	23.92
37	0.1 Skilled	49	0.24	60.00	2920	12.97
38	0.2 Unskilled	99	0.48	20.00	1976	8.78

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TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

	Criteria	Description	
49	1 Spatial Efficiency:	Internal Space/Built Area	0.83
50	2 Cost Effectiveness:	1) Internal Space/Rs100 (sf)	1.07
51	(Space & Employment Achieved	Rs/sf of Internal Space (Rs	93.82
52	/Rs 100 Expenditure)	2) Onsite Employment: Total(Md)	0.72
		" " " Unskilled	0.48
	3 Labour Productivity:	Mandays/sf of Internal Space(M	0.61

I.C.2) Summary Two

	o p	Costs /Rs100 r
	TOTAL COSTS	100.00
	Mat.+Lab. EXPENDITURES	90.91
	Contractor PROFIT	9.09
	1.0 MATERIALS	66.83
	1.1 Local: (Low Import/Trnsp)	26.00
	Earth	0.75
	Sand	8.65
	Formwork	3.13
	Bricks,Tiles, Ballast	15.81
	1.2 Non-Local (Hi'Import/Trsp)	40.82
	Bitumin,Polythene	7.50
	Aggregate	7.17
	Cement	19.96
	Steel Bars	6.20
	2.0 LABOUR	21.74
	2.1 Skilled	12.97
	2.2 Unskilled	8.78

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

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

1: COEFFICIENTS of Distribution

Spatially Ext. v	Dst. w	By Income Group: Within District Urban y	Rural INPUTS	Upper ab	Lower ac	Local Govt. ae
0.00	1.00	1.00	0.00	1.00	0.00	0.00
0.00	1.00	0.00	1.00	0.50	0.50	0.00
0.00	1.00	0.71	0.29	0.77	0.23	0.03
0.00	1.00	1.00	0.00	1.00	0.00	0.00
0.57	0.43	0.07	0.36	0.14	0.29	0.01
0.93	0.07	0.07	0.00	0.04	0.03	0.00
0.80	0.20	0.20	0.00	0.18	0.02	0.01
0.94	0.06	0.06	0.00	0.06	0.00	0.00
0.90	0.10	0.10	0.00	0.08	0.02	0.00
0.00	1.00	0.75	0.25	0.00	1.00	0.00
0.00	1.00	0.00	1.00	0.00	1.00	0.00

2: DISTRIBUTION OF CONSTRUCTION EXPENDITURES (/Rs100)

Spatially External District ai	aj	By Income Groups: Within District Urban al	Rural am	Upper ao	Lower ap	Local Govt. ar
46.06	53.94	32.97	20.97	24.75	29.19	0.49
46.06	44.85	23.88	20.97	15.66	29.19	0.49
0.00	9.09	9.09	0.00	9.09	0.00	0.00
46.06	23.10	14.15	8.95	15.66	7.44	0.49
9.01	19.33	10.38	8.95	12.38	6.95	0.42
0.00	0.75	0.00	0.75	0.37	0.37	0.00
0.00	8.65	6.14	2.51	6.66	1.99	0.26
0.00	3.13	3.13	0.00	3.13	0.00	0.00
9.01	6.80	1.11	5.69	2.21	4.59	0.16
37.05	3.78	3.78	0.00	3.28	0.49	0.07
6.97	0.52	0.52	0.00	0.30	0.22	0.00
5.73	1.43	1.43	0.00	1.29	0.14	0.07
18.77	1.20	1.20	0.00	1.20	0.00	0.00
5.58	0.62	0.62	0.00	0.50	0.12	0.00
0.00	21.74	9.72	12.02	0.00	21.74	0.00
0.00	12.97	9.72	3.24	0.00	12.97	0.00
0.00	8.78	0.00	8.78	0.00	8.78	0.00

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

	NET TOTAL	Distribution of Savings Spatially External District	Within District	By Income Groups Urban	Rural	Upper	Lower	Local Govt.
Distribution of Expenditures		46.06	44.85	23.88	20.97	15.66	29.19	0.49
Marginal Propensity to Save	Input=>	0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS DISTRIBUTION		4.61	0.90	0.72	0.42	1.57	0.00	0.10
SAVINGS TOTAL	5.50		5.50		1.14		1.57	

I.4.1

Fig. IMPORTED CONSTRUCTION Technology 1: Fired - Brick Walls, Reinforced Concrete Roof.
Model of variables & their Effects on Basic, COST-BENEFIT & Savings Criteria

(mdtkim1)

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

	INPUTS	QUANTITIES Total Input \/	/100Rs g	COSTS (Rs) /Unit Input \/	Total j	/100Rs k
	c d					
16	TOTAL COSTS				22517	100
17						
18	Mat.+Lab. EXPENDITURES				20470	90.91
19	Contractor's PROFIT (%of M+L)			10.00	2047	9.09
20	\/					
21	1.0 MATERIALS				15574	69
22	1.1 Local (Low-import/Transp)				6382	28
23	Earth (cf)	306	1.50	0.55	168	0.75
24	Sand (cf)	487	2.38	4.00	1949	8.65
25	Wood Forms (17 days rent)				704	3.13
26	Coal-Fired Bricks (#)	9482	46.32	0.32	3034	13.48
27	Coal-Fired Roof Tiles(#)	760	3.71	0.55	418	1.86
28	Brick Ballast (cf)	31	0.15	3.50	109	0.48
29	1.2 Non - Local (Hi'Import/Transp)				9192	41
30	Bitumin (lbs)	89	0.43	17.80	1584	7.04
31	Polythene (sf)	261	1.28	0.40	104	0.46
32	Aggregate (cf)	248	1.21	6.50	1613	7.17
33	Cement (cwt,50kg,1bag)	62	0.30	72.50	4495	19.96
34	Mild-Steel Bars 1/2"0 (kg)	310	1.51	4.50	1395	6.20
35						
36	2.0 LABOUR (Man Days)	147	0.72		4896	22
37	0.1 Skilled	49	0.24	60.00	2920	12.97
38	0.2 Unskilled	99	0.48	20.00	1976	8.78
39						

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TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

	Criteria	Description	
49	1 Spatial Efficiency:	Internal Space/Built Area	0.83
50	2 Cost Effectiveness:	1) Internal Space/Rs100 (sf)	1.07
51	(Space & Employment Achieved /Rs 100 Expenditure)	Rs/sf of Internal Space (Rs)	93.82
52		2) Onsite Employment: Total (Md)	0.72
		" " " Unskilled	0.48
	3 Labour Productivity:	Mandays/sf of Internal Space (Md	0.61

II.B: TECHNOLOGY CHOICE CRITERIA 2.B) — EFFECT OF DISCOUNTING & SHADOW PRICING ON COSTS, BENEFITS & INCOME DISTRIBUTION

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

	o p	Costs /Rs100 r	
==>	TOTAL COSTS	100.00	%
	Mat.+Lab. EXPENDITURES	90.91	
	Contractor's PROFIT	9.09	
	1.0 MATERIALS	69.17	%
	1.1 Local: (Low Import/Trnsp)	28.34	%
	Earth, Sand, Formwork	12.53	%
==>	Bricks, Tiles, Ballast	15.81	%
	1.2 Non-Local (Hi'Import/Trsp)	40.82	%
	Bitumin, Polythene	7.50	%
	Aggregate	7.17	%
	Cement	19.96	%
	Steel Bars	6.20	%
	2.0 LABOUR (Man Days)	21.74	%
	2.1 Skilled	12.97	%
	2.2 Unskilled	8.78	%

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

	1: FINANCIAL ANALYSIS (Using Market Prices) (0%) v	(10%) w	(20%) x	ADJUSTMENT FACTOR (AF) (To Get Shadow Price) Tradable Content Input	AF Input	Weighted AF ad	2: ECONOMIC ANALYSIS (Using Shadow Prices) (0%) ah	(10%) ai	(20%) aj	3: SOCIAL ANALYSIS (Income Distribution) At 0% Discount Rate Proj. an	Wrkr. ao	Bsns. ap	Govt. aq
==>	100.00	90.91	83.33				89.30	81.19	74.42	-10.70	1.76	1.36	7.58
	22517		18764				20108		16757				
	9.09	8.26	7.58				9.09	8.26	7.58				
	69.17	62.88	57.64				60.23	54.75	50.19				
	28.34	25.77	23.62				27.55	25.05	22.96				
	12.53	11.39	10.44				12.53	11.39	10.44				
==>	15.81	14.38	13.18	1.00	-0.05	-0.05	15.02	13.66	12.52	-0.79			0.79
	40.82	37.11	34.02				32.67	29.70	27.23				
	7.50	6.82	6.25	1.00	?	0.00	7.50	6.82	6.25	0.00		0.00	
	7.17	6.51	5.97	0.20	?	0.00	7.17	6.51	5.97	0.00		0.00	
	19.96	18.15	16.64	1.00	-0.34	-0.34	13.18	11.98	10.98	-6.79			6.79
	6.20	5.63	5.16	1.00	-0.22	-0.22	4.83	4.39	4.03	-1.36		1.36	
	21.74	19.77	18.12				19.99	18.17	16.66				
	12.97	11.79	10.81				12.97	11.79	10.81				
	8.78	7.98	7.31	1.00	-0.20	-0.20	7.02	6.38	5.85	-1.76	1.76		

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

	At 0% Discount Funding Source: Govt.Or Low Y.	Wrkr.	Bsns.	Govt.
Income Distribution	-10.70	-10.70	1.76	1.36	7.58
Marginal Propensity to Save	0.20	0.00	0.00	0.10	0.20
SAVINGS DISTRIBUTION	-2.14	0.00	0.00	0.14	1.52
NET EFFECT ON SAVINGS	a) Government				-0.49
If Project Funds from:	b) Low - Income Person				1.65

I.4.2.

Fig. INDIGENOUS CONSTRUCTION Technology 1: Sun-Brick Walls, Timber Roof
Model of Variables & Effects on Basic, COST-BENEFIT, & Savings Criteria

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

	VARIABLES	QUANTITIES Total	/100Rs	COSTS (Rs) /Unit	Total	/100Rs
	c d	INPUTS \/	g	INPUTS \/	k	L
	TOTAL EXPENDITURES				4499	100.00
	Materials + Labour COSTS				4090	90.91
	Contractor's PROFIT(% of M+L)			10.00	409	9.09
1.0	MATERIALS	\/		\/	2258	50.19
1.1	Local (Low-import/Transp)				2258	50.19
	Earth (cf)	658	16.08	0.55	362	8.04
	Clay (cf)	91	2.24	0.75	69	1.52
	Dung (cf)	6	0.14	Free	0	0.00
	Straw (lbs)	236	5.77	Free	0	0.00
	Grass (sf)	250	6.11	Free	0	0.00
	Reed Mat; Sarkanda (sf)	250	6.11	0.33	83	1.83
	Sirkee (sf)	325	7.95	0.44	143	3.18
	Accacia Beams:4"*8"*14'(#)	2	0.05	225.00	450	10.00
	Uncut Timber Required (cf)	7	0.18	0.00	0	0.00
	" Battens:2.5"*3"*6'(#)	45	1.10	8.00	360	8.00
	Uncut Timber Required (cf)	17	0.41	0.00	0	0.00
	Sun - Bricks (#)	13203	322.80	0.06	792	17.61
1.2	Non-Local(Hi'Import/Transp)	0	0.00	0.00	0	0.00
2.0	LABOUR (Man Days)	85	2.07		1832	40.72
0.1	Skilled	22	0.55	40.00	895	19.89
0.2	Unskilled	62	1.53	15.00	937	20.83

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

	p q	Costs /Rs100 s
	TOTAL EXPENDITURES	100.00
	Materials + Labour COSTS	90.91
	Contractor's PROFIT	9.09
1.0	Materials	50.19
1.1	Local:(lo'Import/Transp)	50.19
	Dung,Straw,Grass(Free)	0.00
	Earth & Clay	9.56
	Reed Mats	5.01
	Timber Beams & Battens	18.00
	Sun-Bricks	17.61
1.2	Non-Local:(hi'Imprt/Trnsp)	0.00
2.0	Labour	40.72
2.1	Skilled	19.89
2.2	Unskilled	20.83

II.B: COST - BENEFIT ANALYSES. (Construction Costs-Expenditures Discounted Over One Year)

1: FINANCIAL ANALYSIS (Using Market Prices) (Discount Rates)			ADJUSTMENT FACTOR: AF (To Get Shadow Price) Tradable Content AF	Weighted AF	2: ECONOMIC ANALYSIS (Using Shadow Prices) (Discount Rates)			3: SOCIAL ANALYSIS (Income Distribution) At 0% Discount Rate Proj. Wrkr. Bsns. Govt.
(0%) v	(10%) w	(20%) x	ab	ac	ad	(0%) ah	(10%) ai	(20%) aj	an ao ap aq
100.00	90.91	83.33	INPUTS			95.83	87.12	79.86	-4.17 4.17 0.00 0.00
4499		3749		\/		4312		3593	
9.09	8.26	7.58				9.09	8.26	7.58	
50.19	45.62	41.82				50.19	45.62	41.82	
50.19	45.62	41.82				50.19	45.62	41.82	
0.00	0.00	0.00				0.00	0.00	0.00	
9.56	8.69	7.97				9.56	8.69	7.97	
5.01	4.56	4.18	===>		===>	5.01	4.56	4.18	===>
18.00	16.37	15.00				18.00	16.37	15.00	
17.61	16.01	14.67				17.61	16.01	14.67	
0.00	0.00	0.00				0.00	0.00	0.00	
40.72	37.02	33.94				36.56	33.23	30.46	
19.89	18.08	16.58				19.89	18.08	16.58	
20.83	18.94	17.36	1.00	-0.20 -0.20		16.67	15.15	13.89	-4.17 4.17

III.B: TECHNOLOGY CHOICE CRITERIA: IMPACT ON SAVINGS

	At 0% Discount Funding Source: Govt.	Or Low Y	Wrkr.	Bsns.	Govt.
Income Distribution	-4.17	-4.17	4.17	0.00	0.00
Marginal Propensity to Save(INP	0.20	0.00	0.00	0.15	0.20
SAVINGS DISTRIBUTION	-0.83	0.00	0.00	0.00	0.00
NET EFFECT ON SAVINGS	a) Government				-0.83
if Project funds from:	b) Low-Income Person				0.00

TECHNOLOGY CHOICE CRITERIA I: BASIC CRITERIA

Criteria	Description	
1 Spatial Efficiency:	Internal Space/Built Area	0.75
2 Cost Effectiveness:	1) Internal Space/Rs100 (sf)	4.82
(Space & Employment Achieved /Rs 100 Expenditure)	Rs/sf of Internal Space (Rs)	20.73
	2) Onsite Employment:Total(Md)	2.07
	" " " Unskilled	1.53
3 Labour Productivity:	Mandays/sf of Internal Space(Md	0.39

I 51

Fig. SWITCHING From Indigenous to Imported CONSTRUCTION Technologies.
(cnswcf2a) From Sun-Brick Wall, Timber Roof Type to Fired Brick Wall, Reinforced Concrete Roof Type Technolo
NET EFFECTS on Income Distribution, Costs, Employment, Productivity & Savings.
(Comparing Results of CASH - FLOW Analysis)

A: INCOME DISTRIBUTION	Through Cash - Flow from Construction Expenditures					
	Spatially External District		Within District		By Income Group		Local Govt
Construction Technology Type			Urban	Rural	Upper	Lower	
c d	f	g	i	j	l	m	o
Indigenous (Sun-Brick Walls, Timber Roof)	2.04	98.01	17.10	81.08	29.39	68.75	0.68
Imported (Fired Brick Walls, RCC Roof)	46.06	53.94	32.97	20.97	24.75	29.19	0.49
INCOME DISTRIBUTION	44.02	-44.07	15.87	-60.11	-4.64	-39.56	-0.19
NET INCOME EFFECT		-0.05		-44.24		-44.20	-0.19

B: CONSTRUCTION COST-EFFECTIVENESS	X	Y
	Rs/sf	sf/Rs100
s	u	v
Indigenous	20.73	4.82
Imported	93.82	1.07
NET LOSSES(Rs,$s)	-73.09	-3.76
Value/sf (Rs)		20.73
Total Value of sf Lost (Rs)		-77.90

C1: EMPLOYMENT (MDays/Rs100) (Onsite)	Total	Unskilled
z	ab	ac
Indigenous	2.07	1.53
Imported	0.72	0.48
NET EMPLOYMENT	-1.35	-1.05

D: SAVINGS THROUGH:	D1: Income Distribution						
	Spatially External District		Within District		By Income Group		Local Govt
			Urban	Rural	Upper	Lower	
Net Income Distribution	44.02	-44.07	15.87	-60.11	-4.64	-39.56	-0.19
Marginal Propensity to Save (Input ==>	0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS DISTRIBUTION	4.40	-0.79	0.48	-1.20	-0.46	0.00	-0.04
NET SAVINGS 3.61		3.61		-0.73		-0.46	-0.04

D2: Construction Cost Differences	If Consumer is: Govt.	Low Y.
Marg.Prop.to Save	0.20	0.00
SAVINGS Effect		
From: X) Rs/sf	-14.62	0.00
Y) sf/Rs100	-15.58	0.00
NET SAVINGS EFFECT		
D1 + X) Rs/sf:	-11.01	
		3.61
D1 + Y) sf/Rs100:	-11.97	3.61

D3: Net Wages	
Net Employment	-1.35
Wages/Mday	30.00
Net Wages	-40.50
M.P.to Save	0.00
SAVINGS EFFECT	0.00
NET SAVINGS	
(D2+D3):	3.61

I 5.2

Fig. SWITCHING from Indigenous to Imported CONSTRUCTION Technologies
(From Sun-Brick Wall, Timber Roof to Fired Brick Wall, Reinforced Concrete Roof Types)
NET EFFECTS on Income Distribution, Costs, Employment, Productivity & Savings
(Comparing Results of COST-BENEFIT Analysis)

(cnswcb1a)

A: INCOME DISTRIBUTION	Groups Affected:			
	Project	Bsnss.	Wrkr.	Central Govt.
Construction Technology Type c	e	f	g	h	j
Indigenous (Sun-Brick Walls, Timber Roof)	-4.17	0.00	4.17	0.00
Imported (Fired Brick Walls, RCC Roof)	-10.70	1.76	1.36	7.58
NET INCOME DISTRIBUTION	-6.53	1.76	-2.81	7.58

B: CONSTRUCTION: COST EFFECTIVENESS	X	Y
	Rs/sf	sf/Rs100
n	Input \/	q
Indigenous	20.73	5.31
Imported	93.82	1.17
NET LOSSES (Rs,sf)	-73.09	-4.14
Value/sf (Rs)		20.73
TOTAL Value of lost sf (Rs)		-85.82

C1: EMPLOYMENT (Man Days/Rs100) (Onsite)	Total	Unskilled
n	p	r
Indigenous	2.07	1.53
Imported	0.72	0.48
NET EMPLOYMENT	-1.35	-1.05

C2: LABOUR PRODUCTIVITY (ManDays/sf)
u
0.39
0.61
-0.22

D: SAVINGS THROUGH:	D1: Income Distribution				
	If Project is:	Busnes	Worker	Central Govt.	
	Govt. or Low Y.				
Net Income Distribution	-6.53	-6.53	1.76	-2.81	7.58
Marginal Propensity to Save. (Input ===>	0.20	0.00	0.10	0.00	0.20
NET SAVINGS DISTRIBUTION	-1.31	0.00	0.18	0.00	1.52
NET SAVINGS EFFECT					
If Project Funded by:	a) Government				0.39
	b) Low-Income Person				1.69

D2: Construction Costs Savings/Losses	If Funder is: Govt.	Low Y.
Marg.Prop.to Save	0.20	0.00
SAVINGS Effect		
From: X) Rs/sf	-14.62	0.00
Y) sf/Rs100	-17.16	0.00
NET SAVINGS EFFECT		
D1a) + X) Rs/sf	-14.23	
		1.69
D1b) + Y) sf/Rs100	-16.78	
		1.69

D3: Net Wages	
Net Employment	-1.35
Wages/Mday	30.00
Net Wages	-40.50
M.P.to Save	0.00
SAVINGS EFFECT	0.00
NET SAVINGS	
D1a) + D2 + D3	-16.78
D1b) + D2 + D3	1.69

II. 1·1

gim2)

INDIGENOUS PRODUCTION Technology 1: Wall Type, Agri-Waste Fired, Brick Kiln.
Production Variables and their Effects on Basic, CASH - FLOW, & Savings Criteria.

I.A: PRODUCTION ANALYSIS; Summary One.

VARIABLES 1.	Input \/	Description
1 Capacity:Bricks/load/year	200	200 K Bricks/30days/load. 9 loads/year 1800 K brick
2 Output: Production Cycles	4	4 loads/year. 800 K Bricks
3 Production Period	6	6 months. December to June
4 Financing	0.372	CRF for 5 year loan at 25% interest

VARIABLES 2.	QTY. (K Bricks) /load			PRICE (Rs) /KBrs Input \/	/load l	/year l	/KBrs o	/Rs100 p
c d	f	g	h					
A: RECEIPTS	200			263	52600	210400	263.00	100.00
B: EXPENDITURES					44727	178908	223.63	85.03
C: INCOME					7873	31492	39.37	14.97

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /kiln	/KBrs.	/Rs100	COSTS(Rs) /unit \/	/load	/year	/KBrs.	/Rs100
1.0.Capital	Input or Output			2923	453	1813	2.27	0.86
1.1.Plant				2134	331	1324	1.66	0.63
1.2.Equipment (#s)				789	122	489	0.61	0.23
2.0.Kiln Land (Ac.)	0.6	0.003	0.001140	3000	450	1800	2.25	0.86
	/load	/Kbrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
3.0 Materials					32498	129992	162.49	61.78
3.1 Local (Low Import)					16958	67832	84.79	32.24
Clay Land (Acres)	0.14	0.0007	0.0003	3000	420	1680	2.10	0.80
Water (hrs)	6	0.03	0.01	20	120	480	0.60	0.23
Sand (cf)	600	3	1.14	0.67	402	1608	2.01	0.76
Wood (mds)	160	0.8	0.30	14	2240	8960	11.20	4.26
Agri-Waste(Truck=250cf)	42	0.21	0.08	328	13776	55104	68.88	26.19
3.2 Transport (trucks)	42	0.21	0.08	370	15540	62160	77.70	29.54
	/kiln	Md/KBrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
4.0 Labour (#s,ManDays,Rs)	21	3.94	1.50		10850	43400	54.25	20.63
4.1 Skilled/Up.Y.(Rs/mth)	1	0.19	0.07	700	1050	4200	5.25	2.00
4.2 Unskilled/Lo.Y(Rest)	20	3.75	1.43		9800	39200	49.00	18.63
Piece Workers(Rs/Kbrs)	18	3.38	1.28	43	8600	34400	43.00	16.35
Wage Workers(Rs/mth)	2	0.38	0.14	800	1200	4800	6.00	2.28
5.0 Miscellaneous				/KBr	476	1903	2.38	0.90
Taxes(Rs/year)				7	350	1400	1.75	0.67
Interest(Rs/year)					126	503	0.63	0.24

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA		/Kbrs	/Rs100
1 Cost Minimisation:	Production Cost/Unit Output	223.63	85.03
2 Profitability:	Net Return on Expenditures	39.37	14.97
3 Capital Productivity:	1) Capital Investment/Unit Output	2.27	0.86
	2) Capital Investment/Unit Employment(Md)		0.58
	" " / " (Unskilled)		0.60
4 Labour Productivity:	Mandays/Unit Output	3.94	1.50

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

I.A.2) PRODUCTION ANALYSIS: Summary Two. u	Annualised Cash Flow /Rs100 w
A: RECEIPTS	100.00
B: EXPENDITURES	85.03
C: INCOME	14.97
B: INPUTS (EXPENDITURES)	
1.0.0 Capital	0.86
1.1.0 Plant	0.63
1.2.0 Equipment	0.23
2.0.0 Kiln Land	0.86
3.0 Materials	61.78
3.1 Local(Low Import)	32.24
3.2 Transport(Trucks)	29.54
4.0 Labour	20.63
4.1 Skilled/Up.Y.	2.00
4.2 Unskilled/Lo.Y	18.63
5.0 Miscellaneous	0.90
Taxes	0.67
Interest	0.24

II.A: CASH/INCOME - FLOW THROUGH MATERIALS' EXPENDITURES

1: COEFFICIENTS of Distribution Spatially Ext. Dst. aa	ab	Within District Urb. aa	Rur. ae	Income Groups Up.Y. ag	Lo.Y. ah	Govt. aj	2: DISTRIBUTION of Receipts (From Materials' Expenditures) Spatially External District an	ao	Within District Urban aq	Rural ar	By Income Groups Upper at	Lower au	Govt. aw
				Input									
A: RECEIPTS							9.88	89.82	24.07	65.75	43.62	46.20	0.96
B: EXPENDITURES							9.88	74.85	20.32	54.53	36.13	38.72	0.96
C: INCOME	0.00	1.00	0.25	0.75	0.50	0.50	0.00	14.97	3.74	11.23	7.48	7.48	0.00
1.0.0 Capital	0.00	1.00	0.25	0.75	0.50	0.50	0.00	0.14	0.73	0.21	0.52	0.23	0.50	0.00
1.1.0 Plant	0.03	0.97	0.18	0.79	0.27	0.70	0.00	0.02	0.61	0.11	0.50	0.17	0.44	0.00
1.2.0 Equipment	0.50	0.50	0.40	0.10	0.25	0.25	0.00	0.12	0.12	0.09	0.02	0.06	0.06	0.00
2.0.0 Kiln Land	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.86	0.00	0.86	0.86	0.00	0.00
3.0 Materials								9.75	51.74	19.50	32.24	32.32	19.42	0.30
3.1 Local(Low Import)	0.00	1.00	0.00	1.00	0.70	0.30	0.00	0.00	32.24	0.00	32.24	22.57	9.67	0.00
3.2 Transport(Trucks)	0.33	0.66	0.66	0.00	0.33	0.33	0.01	9.75	19.50	19.50	0.00	9.75	9.75	0.30
4.0 Labour								0.00	20.63	0.00	20.63	2.00	18.63	0.00
4.1 Skilled/Up.Y.	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	0.00	0.00
4.2 Unskilled/Lo.Y	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	18.63	0.00	18.63	0.00	18.63	0.00
5.0 Miscellaneous								0.00	0.90	0.62	0.29	0.74	0.17	0.67
Taxes	0.00	1.00	0.75	0.25	0.75	0.25	1.00	0.00	0.67	0.50	0.17	0.50	0.17	0.67
Interest	0.00	1.00	0.50	0.50	1.00	0.00	0.00	0.00	0.24	0.12	0.12	0.24	0.00	0.00

III.A: TECHNOLOGY CHOICE CRITERIA: EFFECT ON SAVINGS

	NET TOTAL	Distribution of Savings Spatially External District	Within District Urban	Rural	By Income Groups Upper Y.	Lower Y.	Govt.
Distribution of Receipts		9.88	89.82	24.07	65.75	43.62	46.20	0.96
Marginal Propensity to Save	Inputs=>	0.1	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		0.99	1.80	0.72	1.32	4.36	0.00	0.19
SAVINGS TOTAL:	2.78		2.78		2.04		4.36	0.19

oim2)

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

I.A: PRODUCTION ANALYSIS: Summary One.

VARIABLES 1:	Description			
	Inputs \/			
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	Qty. (KBrs.) /load f	g	h	Price (Rs.) /KBrs. j	/load l	/year m	/Kbrs o	/Rs100 p
A RECEIPTS (Benefits)	400			303	121200	727200	303.00	100.00
B EXPENDITURES (Costs)					118118	708710	295.30	97.46
C INCOME (Net Values)					3082	18490	7.70	2.54

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /kiln Inputs or Outputs	/KBrs.	/Rs100	COSTS(Rs) /unit	/load	/year	/KBrs.	/Rs100
1.0.Capital				67460	1636	9815	4.09	1.35
1.1.Plant	\/			60000	1000	6000	2.50	0.83
1.2.Equipment (#s)				7460	636	3815	1.59	0.52
2.0.Kiln Land (Ac.)	1.5	0.0038	0.0012	3000	750	4500	1.88	0.62
	/load	/Kbrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
3.0 Materials					86332	517992	215.83	71.23
3.1 Local (Low Import)					14204	85224	35.51	11.72
Clay Land (Acres)	0.28	0.0007	0.0002	3000	840	5040	2.10	0.69
Water (hrs)	12	0.0300	0.0099	20	240	1440	0.60	0.20
Sand (cf)	1200	3.0000	0.9901	0.67	804	4824	2.01	0.66
Wood (mds)	880	2.2000	0.7261	14	12320	73920	30.80	10.17
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
	/kiln	Md/KBrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
4 Labour (#s,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	29600	12.33	4.07
5.0 Miscellaneous				/KBr	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.

I.A.2) PRODUCTION ANALYSIS: Summary Two u	Annualised Cash Flow 0% /Rs100 w
A RECEIPTS	100.00
B EXPENDITURES	97.46
C INCOME	2.54
B: INPUTS (Expenditures)	
1.0 Capital	1.35
1.1 Plant	0.83
1.2 Equipment	0.52
2.0 Kiln Land	0.62
3.0 Materials	71.23
3.1 Local:Low Import	11.72
3.2 Non-Local	59.51
Oil:incl.Trnsprt	17.19
Coal:excl.Trsprt	18.23
Transport: Coal	24.09
4.0 Labour	22.28
4.1 Skilled/Up.Y.	1.71
4.2 Unskilled/Lo.Y	20.57
5.0 Miscellaneous	1.98
5.1 Taxes	0.39
5.2 Interest	1.60

CASH-FLOW FROM MATERIALS' PURCHASES: Distribution of Receipts; Spatially and by Income Groups

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

1: COEFFICIENTS of Distribution	Spatially Ext. Dst.	Within District Urb. Rur.	Up.Y.Lo.Y.	Income Group	Govt.
	aa ab	ad ae	ag ah		aj
	Input \/				
A RECEIPTS					
B EXPENDITURES					
C INCOME	0.00 1.00	0.66 0.33	1.00 0.00	0.00	
B: INPUTS					
1.0 Capital	0.40 0.60	0.20 0.40	0.20 0.40	0.00	
1.1 Plant	0.50 0.50	0.40 0.10	0.25 0.25	0.00	
1.2 Equipment					
2.0 Kiln Land	0.00 1.00	0.00 1.00	1.00 0.00	0.00	
3.0 Materials					
3.1 Local:Low Import	0.00 1.00	0.00 1.00	0.70 0.30	0.00	
3.2 Non-Local					
Oil:incl.Trnsprt	0.80 0.20	0.20 0.00	0.10 0.10	0.01	
Coal:excl.Trsprt	1.00 0.00	0.00 0.00	0.00 0.00	0.00	
Transport: Coal	1.00 0.00	0.00 0.00	0.00 0.00	0.00	
4.0 Labour					
4.1 Skilled/Up.Y.	0.00 1.00	0.50 0.50	0.00 1.00	0.00	
4.2 Unskilled/Lo.Y	0.00 1.00	0.00 1.00	0.00 1.00	0.00	
5.0 Miscellaneous					
5.1 Taxes	0.00 1.00	0.75 0.25	0.75 0.25	1.00	
5.2 Interest	0.00 1.00	0.50 0.50	1.00 0.00	0.00	

2: DISTRIBUTION of Receipts	Spatially External District an	ao	Within District Urban aq	Rural ar	Income Groups Upper at	Lower au	Local Govt. aw
A RECEIPTS	56.67	43.33	7.43	35.88	15.26	28.07	0.56
B EXPENDITURES	56.67	40.79	5.75	35.04	12.72	28.07	0.56
C INCOME	0.00	2.54	1.68	0.84	2.54	0.00	0.00
1.0 Capital	0.59	0.76	0.37	0.38	0.30	0.46	0.00
1.1 Plant	0.33	0.50	0.17	0.33	0.17	0.33	0.00
1.2 Equipment	0.26	0.26	0.21	0.05	0.13	0.13	0.00
2.0 Kiln Land	0.00	0.62	0.00	0.62	0.62	0.00	0.00
3.0 Materials	56.07	15.16	3.44	11.72	9.92	5.23	0.17
3.1 Local:Low Import	0.00	11.72	0.00	11.72	8.20	3.52	0.00
3.2 Non-Local	56.07	3.44	3.44	0.00	1.72	1.72	0.17
Oil:incl.Trnsprt	13.75	3.44	3.44	0.00	1.72	1.72	0.17
Coal:excl.Trsprt	18.23	0.00	0.00	0.00	0.00	0.00	0.00
Transport: Coal	24.09	0.00	0.00	0.00	0.00	0.00	0.00
4.0 Labour	0.00	22.28	0.85	21.42	0.00	22.28	0.00
4.1 Skilled/Up.Y.	0.00	1.71	0.85	0.85	0.00	1.71	0.00
4.2 Unskilled/Lo.Y	0.00	20.57	0.00	20.57	0.00	20.57	0.00
5.0 Miscellaneous	0.00	1.98	1.09	0.89	1.88	0.10	0.39
5.1 Taxes	0.00	0.39	0.29	0.10	0.29	0.10	0.39
5.2 Interest	0.00	1.60	0.80	0.80	1.60	0.00	0.00

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

III.A: SAVINGS ANALYSIS.	NET SAVING	Spatially External District	Within District		By Income Groups Upper	Lower	Local Govt.
			Urban	Rural			
Distribution of Receipts		56.67	43.33	7.43	35.88	15.26	28.07	0.56
Marginal Propensity to Save	Inputs=>	0.1	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		5.67	0.87	0.22	0.72	1.53	0.00	0.11
SAVINGS TOTAL:	6.53		6.53		0.94		1.53	0.11

II 3·0

Fig. (pdswhbsc) SWITCHING FROM INDIGENOUS TO IMPORTED PRODUCTION TECHNOLOGIES: Brick Kilns; Wall Type, Agri - Waste Fired versus Trench Type, Coal & Oil Fired. NET EFFECTS ON BASIC CRITERIA: PROFITABILITY, CAPITAL & LABOUR PRODUCTIVITY, EMPLOYMENT.

A: Capacity utilisation: Wall Kiln = 66%; Rotary-Trench Kiln = 75%

	BASIC CRITERIA	PROFITABILITY(/Rs100 Output)			PRODUCTIVITY				
			Financial	Economic	Capital			Labour (Man Days) Employment	
			At Discount Rates						
	Production Technology Type(Kiln)		0%	0%	20%	/K Bricks	/Rs 100	/Man Day	/K Bricks	/Rs 100
	c d		f	g	i	k	l	m	o	p
17	Indigenous:Wall,Agri-Waste Fired		14.97	19.86	11.88	2.27	0.86	0.58	3.94	1.50
18	Imported:Trench,Coal-Oil Fired		2.54	7.38	4.41	4.09	1.35	0.83	4.92	1.62
19										
20	NET EFFECT		-12.43	-12.48	-7.47	-1.82	-0.49	-0.25	0.98	0.12

B: At 100% Capacity Utilisation

	BASIC CRITERIA	PROFITABILITY(/Rs100 Output)			PRODUCTIVITY				
			Financial	Economic	Capital			Labour (Man Days) Employment	
			At Discount Rates						
	Production Technology Type(Kiln)		0%	0%	20%	/K Bricks	/Rs 100	/Man Day	/K Bricks	/Rs 100
	c d		f	g	i	k	l	m	o	p
37	Indigenous:Wall,Agri-Waste Fired		18.14	22.89	53.88	0.76	0.29	0.29	2.63	1.00
38	Imported:Trench,Coal-Oil Fired		5.96	10.59	46.52	2.04	0.67	0.55	3.69	1.22
39										
40	NET EFFECT		-12.18	-12.30	-7.36	-1.28	-0.38	-0.26	1.06	0.22

II.4.1.

Fig. (pdswhcf2)

SWITCHING From Indigenous to Imported PRODUCTION Technologies.
Brick Kilns; Wall Type, Agri - Waste Fired versus Trench Type, Coal & Oil Fired.
NET EFFECTS On Income Distribution, Materials' Costs, Employment, Productivity & Savings.
(Comparing Results of CASH - FLOW Analysis)

A: INCOME DISTRIBUTION — Through Cash - Flow from Materials' Purchase Expenditures

Production Technology Type(Kiln)	c	d	Spatially: External District f	g	Within District: Urban i	Rural j	By Income Group: Upper Y. l	Lower Y. m	Local Government o
Indigenous:Wall,Agri-Waste Fired			9.88	89.82	24.07	65.75	43.62	46.20	0.96
Imported:Trench,Coal-Oil Fired			56.67	43.33	7.43	35.88	15.26	28.07	0.56
INCOME DISTRIBUTION			46.79	-46.49	-16.64	-29.87	-28.36	-18.13	-0.40
NET INCOME EFFECT				0.30		-46.51		-46.49	-0.4

B: SAVINGS/LOSSES THRU BRICK PURCHASE

ac	X Rs/KBrs. Input \/	Y Brs/Rs100 af
Indigenous	263.00	380
Imported	303.00	330
NET LOSSES(Rs,$s)	-40.00	-50.20
Value/Brick (Rs)		0.26
TOTAL Value of Bricks(Rs)		-13.20

C1: EMPLOYMENT (MDays/Rs100)

s	Total u	Unskilled v
Indigenous	1.50	0.00
Imported	1.62	0.00
NET EMPLOYMENT	0.12	0.00

D: SAVINGS THROUGH: — D1: Income Distribution

	Spatially: External District	Within District: Urban	Rural	By Income Group: Upper Y.	Lower Y.	Govt.
Net Income Distribution	46.79	-16.64	-29.87	-28.36	-18.13	-0.40
Marginal Propensity to Save: Input=>	0.10	0.03	0.02	0.10	0.00	0.20
SAVINGS DISTRIBUTION	4.68	-0.42	-0.73	-2.84	0.00	-0.08
NET SAVINGS 3.75	3.75		-1.15		-2.84	-0.08

D2: Savings/Losses Thru Brick Purchase ===>

	If Consumer is: Govt.	Low Y.
Marg.Prop.to Save	0.20	0.00
SAVINGS Effect		
From: X) Rs/K Brs.	-8.00	0.00
Y) Brs/Rs100	-2.64	0.00
NET SAVINGS EFFECT		
D1a) + X) Rs/Kbrs:	-4.25	
D1b) + X)		3.75
D1a) + Y) Brs/Rs10	1.11	
D1b) + Y)		3.75

D3: Net Wages ===>

Net Employment	0.12
Wages/Mday	30.00
Net Wages	3.60
M.P.to Save	0.00
SAVINGS EFFECT	0.00
NET SAVINGS D1 + D2 + D3 =>	3.75

Fig.II.4.2 SWITCHING FROM INDIGENOUS TO IMPORTED PRODUCTION TECHNOLOGIES.
(pdswhcb1) (Ex. Brick Kilns; Wall Type, Agri - Waste Fired versus Trench Type, Coal & Oil Fired.)
NET EFFECTS ON INCOME DISTRIBUTION, EMPLOYMENT, LABOUR PRODUCTIVITY, PURCHASE COSTS, & SAVINGS.
(Comparing Results of COST - BENEFIT Analysis)

A: INCOME DISTRIBUTION	Groups Affected:				
	Proj.Or	Cnsmr.	Bsness.	Wrkr.	Central Govt.
Production Technology Type c	e	f	g	h	i
Indigenous (Agri-Fired Kiln)	-24.48	-24.48	0.00	18.63	5.85
Imported (Coal-Fired Kiln)	-24.17	-24.17	0.00	20.57	3.60
NET INCOME DISTRIBUTION	0.31	0.31	0.00	1.94	-2.25

B: SAVINGS/LOSSES THRU BRICK PURCHASES	X	Y
	Rs/KBrs. Input	Brs/Rs100 p
m	\/	
Indigenous	263.00	380
Imported	303.00	330
NET LOSSES(Rs,#s)	-40.00	-50.20
Value/Brick (Rs)		0.263
TOTAL Value of Bricks(Rs)		-13.20

D: SAVINGS THROUGH:	D1: Income Distribution Cnsmr. is:				
	Govt.or Low Y.		Busness.	Worker	Govt.
Net Income Distribution	0.31	0.31	0.00	1.94	-2.25
Marginal Propensity to Save	0.20	0.00	0.15	0.00	0.20
NET SAVINGS DISTRIBUTION	0.06	0.00	0.00	0.00	-0.45
NET SAVINGS EFFECT	a) Government:				-0.39
If Consumer is:	b) Low - Income Person:				-0.45

D2:Savings/Losses Thru Brick Purchases	If Consumer is:	
	Govt.	Low Y.
Marg.Prop.to Save	0.20	0.00
SAVINGS Effect		
From: X) Rs/K Brs.	-8.00	0.00
Y) Brs/Rs100	-2.64	0.00
NET SAVINGS EFFECT		
D1a) + X) Rs/KBrs.	-8.39	
D1b) + X) Rs/KBrs.		-0.45
D1a)+Y) Brs/Rs.100	-3.03	
D1b)+Y) Brs/Rs100		-0.45

III - 1.

g. Indigenous Production Technology 1: SUN-DRIED BRICK Production Unit
brim2) Production Variables & Their Effects on CASH - FLOW, BASIC & SAVINGS CRITERIA.

I.A: PRODUCTION ANALYSIS; Summary One.

VARIABLES 1.	Unit	Description	
1 Capacity:Bricks/load/Yr	56	56 K Bricks/30days/load. 9 loads/year	504 K brick
2 Output: Production Cycle	9	9 loads/year. 504 K Bricks	
3 Production Period	9	9 months. December to June	
4 Financing	0.372	CRF for 5 year loan at 25% interest	

VARIABLES 2.	QTY. (K Bricks) /load			PRICE (Rs) /KBrs	/load	/year	/KBrs	/Rs100
c d	f	g	h	j	l	l	o	p
A: RECEIPTS	56			40	2240	20160	40.00	100.00
B: EXPENDITURES					353	3179	6.31	15.77
C: INCOME					1887	16981	33.69	84.23
INCOME/WORKER					314	2830	5.62	14.04

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /unit	/KBrs.	/Rs100	COSTS(Rs) /unit	/month	/year	/KBrs.	/Rs100
1.0.Capital				989	27	243	0.48	1.21
1.1.Plant				900	10	90	0.18	0.45
1.2.Equipment (%s)				89	17	153	0.30	0.76
2.0.Work Land (Ac.)	0	0.000	0.000	3000	0	0	0.00	0.00
(incl.in clay land)								
	/month	/Kbrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
3.0 Materials					264	2374	4.71	11.78
3.1 Local (Low Import)					264	2374	4.71	11.78
Clay Land (Acres)	0.039	0.0007	0.0018	3000	118	1058	2.10	5.25
Water (hrs)	1.68	0.03	0.08	20	34	302	0.60	1.50
Sand (cf)	168	3	7.50	0.67	113	1013	2.01	5.03
3.2 Non-Local(Import/Transp)	0	0	0	0	0	0	0	0
	/kiln Md	/KBrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
4.0 Labour (%s,ManDays,Rs)	6	2.68	6.70		0	0	0.00	0.00
4.1 Skilled/Up.Y.(Rs/mth)	0	0.00	0.00	0	0	0	0.00	0.00
4.2 Unskilled/Lo.Y(Rest)	6	2.68	6.70		0	0	0.00	0.00
Moulders(Rs/Kbrs)	3	1.34	3.35	Share	0	0	0.00	0.00
Carriers(Rs/KBrs)	3	1.34	3.35	Profit	0	0	0.00	0.00
5.0 Miscellaneous				/KBr	62	562	1.12	2.79
Taxes(Rs/year)				7	44	392	0.78	1.94
Interest(Rs/year)					19	170	0.34	0.84

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

			/Kbrs	/Rs100
1 Cost Minimisation:	Production Cost/Unit Output		6.31	15.77
2 Profitability:	Net Return on Expenditures		33.69	84.23
3 Capital Productivity:	1) Capital Investment/Unit Output		0.48	1.21
	2) Capital Investment/Unit Employment(Md)			0.18
	" " / " (Unskilled)			0.18
4 Labour Productivity:	Mandays/Unit Output		2.68	6.70

TECHNOLOGY CHOICE

CRITERIA 2.a: CASH - FLOW FROM MATERIALS PURCHASES: Distribution of Receipts;

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

I.A.2) PRODUCTION ANALYSIS: Summary Two. u	Annualised Cash Flow /Rs100	1: COEFFICIENTS of Distribution Spatially Ext. Dst.	Within District Urb.	Rur.	Income Groups Up.Y.	Lo.Y.	Gvt.	2: DISTRIBUTION of Receipts (From Materials' Expenditures) Spatially External District	Within District Urban	Rural	By Income Groups Upper Y.	Lower Y.	Local Govt.
	0% w	aa ab	ad	ae	ag	ah	aj	an ao	aq	ar	at	au	aw
A: RECEIPTS	100.00							0.56 99.44	14.73	84.69	31.71	67.72	1.94
B: EXPENDITURES	15.77							0.56 15.21	2.10	13.09	10.65	4.54	1.94
C: INCOME	84.23	0.00 1.00	0.15	0.85	0.25	0.75	0.00	0.00 84.23	12.63	71.60	21.06	63.17	0.00
B: INPUTS (EXPENDITURES)													
1.0.Capital	1.21							0.56 0.65	0.39	0.25	0.28	0.37	0.00
1.1.Plant	0.45	0.40 0.60	0.20	0.40	0.20	0.40	0.00	0.18 0.27	0.09	0.18	0.09	0.18	0.00
1.2.Equipment	0.76	0.50 0.50	0.40	0.10	0.25	0.25	0.00	0.38 0.38	0.30	0.08	0.19	0.19	0.00
2.0.Kiln Land	0.00	0.00 1.00	0.00	1.00	1.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00
3.0 Materials	11.78							0.00 11.78	0.00	11.78	8.24	3.53	0.00
3.1 Local(Low Import)	11.78	0.00 1.00	0.00	1.00	0.70	0.30	0.00	0.00 11.78	0.00	11.78	8.24	3.53	0.00
3.2 Non-Local	0.00	1.00 0.00	0.00	0.00	0.00	0.00	0.10	0.00 0.00	0.00	0.00	0.00	0.00	0.00
4.0 Labour	0.00							0.00 0.00	0.00	0.00	0.00	0.00	0.00
4.1 Skilled/Up.Y.	0.00	0.00 1.00	0.00	1.00	1.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00
4.2 Unskilled/Lo.Y	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
5.0 Miscellaneous	2.79							0.00 2.79	1.71	1.06	2.13	0.64	1.94
Taxes	1.94	0.00 1.00	0.66	0.33	0.66	0.33	1.00	0.00 1.94	1.28	0.64	1.28	0.64	1.94
Interest	0.84	0.00 1.00	0.50	0.50	1.00	0.00	0.00	0.00 0.84	0.42	0.42	0.84	0.00	0.00

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

III.A: SAVINGS ANALYSIS		Spatially External District	Within District Urban	Rural	By Income Groups Upper Y.	Lower Y.	Govt.
Distribution of Receipts		0.56 99.44	14.73	84.69	31.71	67.72	1.94
Marginal Propensity to Save		0.1 0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		0.06 1.99	0.44	1.69	3.17	0.00	0.39
SAVINGS TOTAL:	2.04	2.04		2.14		3.17	0.39

III 2.0

Indigenous Production Technology 1: REED (Roof) MATS Making Workshop

(T1) Production Variables & Their Effects on CASH - FLOW, BASIC & SAVINGS CRITERIA.

2A: PRODUCTION ANALYSIS; Summary One.			
VARIABLES 1.	Unit	Description	
1 Capacity:Mats/month	70	70 Mats/30days. 0 months/year:	630
2 Output: Production Cycle	0	0 loads/year. 0 Mats	
3 Production Period	0	0 months.	
4 Financing	0	CRF for 5 year loan at 25% interest	

VARIABLES 2.	QTY. (/mat/18sf/1/7th.mnd		PRICE (Rs)			
	mats		/mat	Tot./mth/year	/mat	/Rs100
c d	f	g h	j	l l	o	p
A: RECEIPTS (/1mnds=7mats each 6'‡3'=18sf)	70		8 .44/sf	560 0	8.00	100.00
B: EXPENDITURES				367 0	5.25	65.61
C: INCOME				193 0	2.75	34.39
INCOME/WORKER				39 0	0.55	6.88

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /unit	/mat	/Rs100	COSTS(Rs) /mth	Total	/year	/mat	/Rs100
1.0.Capital				100	100	0	1.43	17.86
1.1.Plant (shop rent/month)				100	100	0	1.43	17.86
1.2.Equipment:1 pick,2 rods.	negligable			0	0	0	0.00	0.00
2.0.Land		0.000	0.000	0	0	0	0.00	0.00
	/10mnds	/mnd	/Rs100	/mnd	/10mnds	/year	/mat	/Rs100
3.0 Materials					252	0	3.61	45.07
3.1 Local (Low Import)	3.3				87	0	1.25	15.61
Reed Bundles (mnds)	3.3	0	0.0000	18.0	59	0	0.85	10.61
String(Rs.4/mat,Rs2.8/mnd	0	0	0.00	2.8	28	0	0.40	5.00
3.2 Non-Local(Import/Transp)	6.6	0	0	25.0	165	0	2.36	29.46
Reed Bundles(mnds)	6.6			20.0	132		1.89	23.57
3.3 Truck(/mnd)	6.6			5.0	33		0.47	5.89
	/shop	Md/mat	/Rs100	/unit	/load	/year	/mat	/Rs100
4.0 Labour (#s,ManDays,Rs)	5	0.00	0.00	share	0	0	0.00	0.00
4.1 Skilled	1	0.00	0.00	profit	0	0	0.00	0.00
4.2 Unskilled	4	0.00	0.00		0	0	0.00	0.00
5.0 Miscellaneous					15	0	0.21	2.68
Taxes;municipal(Rs/month)				0	15	0	0.21	2.68
Interest(Rs/year)					0	0	0.00	0.00

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA		/Kbrs	/Rs100
1 Cost Minimisation:	Production Cost/Unit Output	5.25	65.61
2 Profitability:	Net Return on Expenditures	2.75	34.39
3 Capital Productivity:	1) Capital Investment/Unit Output	1.43	17.86
	2) Capital Investment/Unit Employment(Md)		ERR
	" " / " (Unskilled)		ERR
4 Labour Productivity:	Mandays/Unit Output	0.00	0.00

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

I.A.2: PRODUCTION ANALYSIS: Summary Two. u	Annualised Cash Flow /Rs100 0% v	1: COEFFICIENTS of Distribution Spatially Ext. Dst.	Within District Urb.	Rur.	Income Groups Up.Y.	Lo.Y.	Gvt.	2: DISTRIBUTION of Receipts (From Materials' Purchases) Spatially External District	Within District Urban	Rural	By Income Groups Upper Y.	Lower Y.	Govt.
		aa ab	ad	ae	ag	ah	aj	an ao	aq	ar	at	au	av
A: RECEIPTS	100.00							29.46 70.54	47.14	23.37	22.75	47.76	2.68
B: EXPENDITURES	65.61							29.46 36.14	19.63	16.49	22.75	13.37	2.68
C: INCOME	34.39	0.00 1.00	0.80	0.20	0.00	1.00	0.00	0.00 34.39	27.51	6.88	0.00	34.39	0.00
B: INPUTS (EXPENDITURES)													
1.0.Capital	17.86							0.00 17.86	17.86	0.00	17.86	0.00	0.00
1.1.Plant	17.86	0.00 1.00	1.00	0.00	1.00	0.00	0.00	0.00 17.86	17.86	0.00	17.86	0.00	0.00
1.2.Equipment	0.00	0.50 0.50	0.40	0.10	0.25	0.25	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00
2.0.Land	0.00	0.00 1.00	0.00	1.00	1.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00
3.0 Materials	45.07							29.46 15.61	0.00	15.61	3.12	12.49	0.00
3.1 Local:Low Import	15.61	0.00 1.00	0.00	1.00	0.20	0.80	0.00	0.00 15.61	0.00	15.61	3.12	12.49	0.00
3.2 Non-Local	29.46	1.00 0.00	0.00	0.00	0.00	0.00	0.00	29.46 0.00	0.00	0.00	0.00	0.00	0.00
4.0 Labour	0.00							0.00 0.00	0.00	0.00	0.00	0.00	0.00
4.1 Skilled/Up.Y.	0.00	0.00 1.00	0.00	1.00	1.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00
4.2 Unskilled/Lo.Y	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
5.0 Miscellaneous	2.68							0.00 2.68	1.77	0.88	1.77	0.88	2.68
Taxes	2.68	0.00 1.00	0.66	0.33	0.66	0.33	1.00	0.00 2.68	1.77	0.88	1.77	0.88	2.68
Interest	0.00	0.00 1.00	0.50	0.50	1.00	0.00	0.00	0.00 0.00	0.00	0.00	0.00	0.00	0.00

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

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

III.A: SAVINGS ANALYSIS		Spatially External District	Within District Urban	Rural	By Income Groups Upper Y.	Lower Y.	Govt.
Distribution of Receipts		29.46 70.54	47.14	23.37	22.75	47.76	2.68
Marginal Propensity to Save		0.10 0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		2.95 1.41	1.41	0.47	2.27	0.00	0.54
SAVINGS TOTAL:	4.36	4.36		1.88		2.27	0.54

Fig. . CASH-FLOW THROUGH PURCHASES OF SAND
(sand1)

	MATERIALS' MERCHANT	PRICE /1cf	/trailer /100cf	/Rs100
	d	f	g	h
A	RECEIPTS	1.5	150	100.00
B	EXPENDITURES		90	76.67
C	INCOME		60	23.33
	INPUTS (Expenditures)	COSTS (Rs) /unit	/trailer /100cf	/Rs100
1.0	NON-LOCAL:Lawrencepur.		0	0.00
	High qlty. only.	0.0	0	0.00
	Not counted here.	0	0	0.00
2.0	LOCAL (River bed/land)		90	76.67
2.1	Trailer owner(pays below)		80	53.33
2.2	Landowner		10	6.67
2.3	Labour		20	13.33
2.4	Octroi Tax		5	3.33

Source: Butt, materials merchant. Sahiwal

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

	1: COEFFICIENTS of Distribution							2: DISTRIBUTION of Receipts						
	Spatially		Income Groups					Spatially		By Income Groups				
	Ext. Dst.	Within District					Gvt.	External	District	Within District				Govt.
		Urb.	Rur.	Up.Y.	Lo.Y.					Urban	Rural	Upper	Lower	
	l	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
A								0.00	100.00	74.07	25.37	78.87	21.10	3.33
B								0.00	76.67	50.73	25.37	55.53	21.10	3.33
C	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	23.33	23.33	0.00	23.33	0.00	0.00
1.0	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
2.0								0.00	76.67	50.73	25.37	55.53	21.10	3.33
2.1	0.00	1.00	0.66	0.33	1.00	0.00	0.00	0.00	53.33	35.20	17.60	53.33	0.00	0.00
2.2	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	6.67	6.67	0.00	0.00	6.67	0.00
2.3	0.00	1.00	0.50	0.50	0.00	1.00	0.00	0.00	13.33	6.67	6.67	0.00	13.33	0.00
2.4	0.00	1.00	0.66	0.33	0.66	0.33	1.00	0.00	3.33	2.20	1.10	2.20	1.10	3.33

IV. 2.

Fig. - CASH-FLOW THROUGH PURCHASES OF AGGREGATE
(aggregl)

	MATERIALS' MERCHANT	PRICE /cf	/truck /250cf	/Rs100
	d	f	g	h
A	RECEIPTS	7	1750	100.00
B	EXPENDITURES		1435	82.00
C	INCOME		315	18.00
	INPUTS (Expenditures)	COSTS (Rs) /unit	/truck /250cf	/Rs100
1.0	NON-LOCAL: Taxila		1400	80.00
1.1	Landowner.(Private/govt.)		25	1.43
1.2	Aggregate Co.		375	21.43
1.3	Materials' Agency		75	4.29
1.4	Labour (to load:/truck)		25	1.43
1.5	Trucker (/truck)		900	51.43
2.0	LOCAL:Sahiwal		35	2.00
2.1	Octroi Tax(/truck)		10	0.57
2.2	Labour (to unload:/truck)		25	1.43

II.A: CASH - FLOW THROUGH MATERIALS' PUCHASES (Distribution of Receipts)

	1: COEFFICIENTS of Distribution						2: DISTRIBUTION of Receipts					
	Spatially		Income Groups				Spatially		By Income Groups			
	Ext. Dst.	Within District				Gvt.	External	District	Within District			Govt.
		Urb.	Rur.	Up.Y.	Lo.Y.				Urban	Rural	Upper	Lower	.
	l m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
							80.00	20.00	19.81	0.19	18.38	1.62	0.57
							80.00	2.00	1.81	0.19	0.38	1.62	0.57
===>	0.00 1.00	1.00	0.00	1.00	0.00	0.00	0.00	18.00	18.00	0.00	18.00	0.00	0.00
	1.00 0.00	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00	0.00	0.00	0.00	0.00
							0.00	2.00	1.81	0.19	0.38	1.62	0.57
	0.00 1.00	0.66	0.33	0.66	0.33	1.00	0.00	0.57	0.38	0.19	0.38	0.19	0.57
	0.00 1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.43	1.43	0.00	0.00	1.43	0.00

Source: M. Butt. Materials' merchant. Sahiwal City.

IV. 3

Fig.
(cement1)

CASH-FLOW THROUGH PURCHASES OF CEMENT

	MATERIALS' MERCHANT	PRICE /50kg bag	/truck 200bags	/Rs100
	d	f	g	h
A	RECEIPTS	70.50	14100	100.00
B	EXPENDITURES	66.38	13275	94.15
C	INCOME	4.13	825	5.85
	INPUTS (Expenditures)	COSTS (Rs) /unit	/truck 200bags	/Rs100
1.0	NON-LOCAL:Hyderabad	66.00	13200	93.62
1.1	Factory	51.00	10200	72.34
1.2	Truck to Sahiwal	15.00	3000	21.28
2.0	LOCAL	0.38	75	0.53
2.1	Labour to unload	0.25	50	0.35
2.2	Octroi Tax	0.13	25	0.18

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

1: COEFFICIENTS of Distribution							2: DISTRIBUTION of Receipts						
Spatially		Income Groups					Spatially		By Income Groups				
Ext. Dst.		Within District				Gvt.	External	District	Within District				Gvt.
		Urb.	Rur.	Up.Y.	Lo.Y.				Urban	Rural	Upper	Lower	
l	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
0.00	1.00	1.00	0.00	1.00	0.00	0.00	93.62	6.38	6.21	0.18	5.97	0.41	0.18
							93.62	0.53	0.35	0.18	0.12	0.41	0.18
							0.00	5.85	5.85	0.00	5.85	0.00	0.00
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
							0.00	0.53	0.35	0.18	0.12	0.41	0.18
0.00	1.00	0.50	0.50	0.00	1.00	0.00	0.00	0.35	0.18	0.18	0.00	0.35	0.00
0.00	1.00	1.00	0.00	0.66	0.33	1.00	0.00	0.18	0.18	0.00	0.12	0.06	0.18

Source: Yahya Khan. Cement Agency Owner. Sahiwal City

IV. 4

Fig. CASH-FLOW THROUGH PURCHASES OF STEEL RODS
(msrods1)

	MATERIALS' MERCHANT	PRICE /kg	/truck /10tons	/Rs100
	d	f	g	h
A	RECEIPTS	4.5	45000	100.00
B	EXPENDITURES		41225	91.61
C	INCOME		3775	8.39
	INPUTS (Expenditures)	COSTS (Rs) /unit	/truck /10tons	/Rs100
1.0	NON-LOCAL (Lahore)		41100	91.33
1.1	Steel Merchant (/kg)	4.0	40000	88.89
1.2	Trucker (/ton)	100	1000	2.22
1.3	Labour (to load:/ton)	10	100	0.22
2.0	LOCAL (Sahiwal)		125	0.28
2.1	Octroi Tax(/truck)		25	0.06
2.2	Labour (to unload:/ton)	10	100	0.22

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

1: COEFFICIENTS of Distribution

Spatially: Ext. Dst.	Within District: Urb.	Within District: Rur.	Income Groups: Up.Y.Lo.Y.		Govt.
l	o	p	r	s	u
0.00	1.00	1.00	0.00	1.00	0.00
1.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	1.00	0.00	0.66	0.33
0.00	1.00	1.00	0.00	0.00	1.00

2: DISTRIBUTION of Receipts

Spatially: External	Spatially: District	Within District: Urban	Within District: Rural	By Income Groups: Upper	By Income Groups: Lower	Govt.
y	z	ab	ac	ae	af	ah
91.33	8.67	8.67	0.00	8.43	0.24	0.06
91.33	0.28	0.28	0.00	0.04	0.24	0.06
0.00	8.39	8.39	0.00	8.39	0.00	0.00
91.33	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.28	0.28	0.00	0.04	0.24	0.06
0.00	0.06	0.06	0.00	0.04	0.02	0.06
0.00	0.22	0.22	0.00	0.00	0.22	0.00

Source: Iftikhar Haq, Rods, Girder Seller, Sahiwal City

IV.5

Fig.
(girder1)

CASH-FLOW THROUGH PURCHASES OF STEEL GIRDERS

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

MATERIALS' MERCHANT	PRICE /rft /3.5kg	/truck /10tons	/Rs100	1: COEFFICIENTS of Distribution: Spatially Ext. Dst.		Within District Urb.	Rur.	Income Groups Up.Y.	Lo.Y.	Gvt.	2: DISTRIBUTION of Receipts: Spatially External	District	Within District Urban	Rural	By Income Groups Upper	Lower	Govt.
d	f	g	h	l	m	o	p	r	s	u	y	z	ab	ac	ae	af	ah
A RECEIPTS	19.50	55714	100.00								96.49	3.51	3.50	0.01	3.37	0.14	0.04
B EXPENDITURES	18.85	53852	96.66								96.49	0.17	0.16	0.01	0.03	0.14	0.04
C INCOME	0.65	1862	3.34 ===>	0.00	1.00	1.00	0.00	1.00	0.00	0.00 ===>	0.00	3.34	3.34	0.00	3.34	0.00	0.00
INPUTS (Expenditures)	COSTS (Rs) /unit	/truck /10tons	/Rs100														
1.0 NON-LOCAL (Lahore)	18.82	53757	96.49	1.00	0.00	0.00	0.00	0.00	0.00	0.00	96.49	0.00	0.00	0.00	0.00	0.00	0.00
1.1 Steel Merchant	18.50	52857	94.87														
1.2 Truck to Sahiwal	0.28	800	1.44														
1.3 Labour(load:Rs70/truck)	0.04	100	0.18														
2.0 LOCAL (Sahiwal)	0.03	95	0.17								0.00	0.17	0.16	0.01	0.03	0.14	0.04
2.1 Octroi Tax(/truck)	0.01	25	0.04	0.00	1.00	0.66	0.33	0.66	0.33	1.00	0.00	0.04	0.03	0.01	0.03	0.01	0.04
2.2 Labour (to unload:/ton)	0.02	70	0.13	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.13	0.13	0.00	0.00	0.13	0.00

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