Fig: 1 Technology Evaluation Model: ANALYSIS UNDERTAKEN & CRITERIA EVALUATED

(mdlcrt:afshar)

ANALYTICAL STEPS	CRITERIA EVALUATED	DESCRIPTION OF CRITERIA
I. Construction & Maintenance Analysis A&C.) Initial Construction: A. By Construction Stage. C. By Inputs.	1) Spatial Efficiency	Internal Space/Built Area
	2) Cost Effectiveness (Space & Employment Achieved/Rs100 Expenditures)	2.1) Space Achieved/Unit Expenditure a) Internal Space/Rs.100 (in sf) b) Rs/sf of Internal Space (in Rs) 2.2) Employment Achieved/Unit Expnditure a) Total Employment (Onsite,in Man days) b) Unskilled Employment
	3) Labour Productivity	Man days/ sf of Internal Space Constructed
B.) Maintenance	1) As above, but over buildings' life-span	Twenty Year Period
	2) Durability versus maintainability	Less Frequent versus Easier & Cheaper Maintenance
II. Production Analysis		All below: a) physical output (1000 bricks) per: b) output value (Rs100)
	1) Cost Minimisation	Production Cost/Unit Output
	2) Profitability	Net Return on Expenditures
	3) Capital Productivity (Capital Invested Per Unit of Output & Employment Achieved)	3.1) Capital Investment/ Unit Output 3.2) Capital Investment/Unit Employment a) Total Onsite Employment (Mandays) b) Unskilled Employment "
	4) Labour Productivity	Man days per Unit Output
III.A. Cash-Flow Analysis	Income recieved through Distribution of Construction Expenditures	Distribution Per Rs100 Expenditures 1) Spatially a) Within & Outside District b) Within District: between Urban & Rural 2) By Income Group (within district): Among Upper & Lower Income, & Local Government
III.B. Cost-Benefit Analysis (Financial, Economic & Social Analysis)	Cost-Benefits in Present Values Discounted at: 1) Financial (Market) Prices	Costs & Benefits (Income Distribution) Discounted over Project Life 1) Project Costs borne, & Income received by Owner (house owner or materials' entrepreuner)
	2) Economic (shadow) Prices to also give: 3) Income Distribution	2) Project Costs borne, & Income recieved by, Society: ie Income Gains & Losses among; i)Project Owner ii)Consumer iii) Business (materials' suppliers) iv) Worker v) Central Government
III. Savings A&B. Analysis (using results of Cash-Flow & Cost-Benefit Analysis)	Net Savings from: A) Income Distributed B) Income Distributed & Construction Costs.	1) Income Distributed & Savings Propensities of Income Groups. 2) Net Effect after Construction Costs Savings or Losses also accounted for.

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

DISTRIBUTION ====> 4/	External District		Within District		Income Group		Local Govt.
			Urban	Rural	Upper	Lower	
INPUTS Into: d	f	g	i	j	l	m	o
1.00 MATERIALS PRODUCTION							
Water.	0.00	100.00	0.00	100.00	100.00	0.00	0.00
Clay.	0.00	100.00	0.00	100.00	100.00	0.00	0.00
Wood Fuel.	0.00	100.00	0.00	100.00	100.00	0.00	0.00
Agricultural Waste	0.00	100.00	0.00	100.00	100.00	0.00	0.00
Coal.	100.00	0.00	0.00	0.00	0.00	0.00	0.01
Furnace Oil. 3/	80.00	20.00	19.80	0.20	18.38	1.62	0.57
2.00 CONSTRUCTION							
Earth, Clay.	0.00	100.00	0.00	100.00	50.00	50.00	0.00
Straw, Dung, Grass.	0.00	100.00	0.00	100.00	50.00	50.00	0.00
Sand. 1/	0.00	100.00	74.07	25.37	78.87	21.10	3.33
Aggregate. 1/	80.00	20.00	19.80	0.20	18.38	1.62	0.57
Bricks							
Sun-Baked. 2/	0.56	99.40	14.91	84.53	31.88	67.56	1.94
Agri-Waste Fired. 2/	10.18	89.82	24.07	65.75	43.62	46.20	0.97
Coal, Oil, Wood Fired 2/	56.67	43.33	7.43	35.88	15.26	28.07	0.56
Reed Mats. 2/	29.94	70.54	46.71	23.83	22.32	48.32	2.68
Timber Beams, Battens. 2/6/	1.50	98.51	12.48	86.03	74.09	24.42	0.49
Steel Girders, T Irons. 1/	96.49	3.51	3.50	0.01	3.37	0.14	0.04
Mild Steel Rods. 1/	91.33	8.67	8.67	0.00	8.43	0.24	0.06
Cement. 1/	93.62	6.38	6.21	0.18	5.97	0.41	0.18
Bitumin. 7/	93.00	7.00	7.00	0.00	4.00	3.00	0.13
Polythene. 7/	93.00	7.00	7.00	0.00	4.00	3.00	0.13
3.00 TRANSPORT: a) Local Firms	33.00	66.00	66.00	0.00	33.00	33.00	1.00
(Trucks) b) Outside Firms	100.00	0.00	0.00	0.00	0.00	0.00	0.01
4.00 LABOUR							
Highly Skilled.	0.00	100.00	100.00	0.00	100.00	0.00	0.00
Skilled.	0.00	100.00	50.00	50.00	0.00	100.00	0.00
Unskilled.	0.00	100.00	0.00	100.00	0.00	100.00	0.00
5.00 BUILDING CONSTRUCTION							
Traditional (Indigenous) 2/	2.04	98.01	17.10	81.08	29.39	68.75	0.68
Intermediate 2/							
Modern (Imported) 2/	46.06	53.94	32.97	20.97	24.75	29.19	0.49

1/ Based on summary calculations. (see relevant figure)

2/ Based on detailed calculations. (see relevant figure)

3/ Based on production & supply figures of aggregate

4/ Inputs without superscript based on interview estimates

/6 Coefficients averaged from different sawmill performances depending on ratio of battens to beam sales

Only battens sold	1.98	98.02	3.65	94.37	78.53	19.49	0.64
Only beams sold	1.01	98.99	21.30	77.69	69.64	29.35	0.33
Total	2.99	197.01	24.95	172.06	148.17	48.84	0.97
AVERAGE APPLIED	1.50	98.51	12.48	86.03	74.09	24.42	0.49

7/ Lahore.Rs28/kilo, Qabula Rs30/kilo.Source: Mohd. Ashraf, Qabula merchant
Stocked only in urban shops. Taxed similar to girders. Labour handling included in Rs2/profits

8/ Following equipment not calculated: From outside the district; Power generator (diesel, electric), rotary band saw. From within district; hand tools, formwork.

Spatially & by Income Groups.

DISTRIBUTION====> 4/	External District		Within District				Local	Govt. 5/
			Urban	Rural	Income Group			
INPUTS Into: v	x	y	aa	ab	Upper ad	Lower ae	ag	ai
1.0 MATERIALS PRODUCTION								
Water.	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00
Clay.	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00
Wood Fuel.	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00
Agricultural Waste	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00
Coal. 3/	1.00	0.00	0.00	0.00	0.00	0.00	.00	0.01
Furnace Oil. 3/	0.80	0.20	0.20	.00	0.18	0.02	0.01	0.57
2.0 CONSTRUCTION								
Earth, Clay.	0.00	1.00	0.00	1.00	0.50	0.50	0.00	0.00
Straw, Dung, Grass.	0.00	1.00	0.00	1.00	0.50	0.50	0.00	0.00
Sand. 1/	0.00	1.00	0.74	0.25	0.79	0.21	0.03	3.33
Aggregate. 1/	0.80	0.20	0.20	.00	0.18	0.02	0.01	0.57
Bricks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sun-Baked. 2/	0.01	0.99	0.15	0.85	0.32	0.68	0.02	1.94
Agri-Waste Fired. 2/	0.10	0.90	0.24	0.66	0.44	0.46	0.01	0.97
Coal, Oil, Wood Fired 2/	0.57	0.43	0.07	0.36	0.15	0.28	0.01	0.56
Reed Mats. 2/	0.30	0.71	0.47	0.24	0.22	0.48	0.03	2.68
Timber Beams, Battens. 2/6/	0.01	0.99	0.12	0.86	0.74	0.24	.00	0.49
Steel Girders, T Irons. 1/	0.96	0.04	0.04	.00	0.03	.00	.00	0.04
Mild Steel Rods. 1/	0.91	0.09	0.09	0.00	0.06	.00	.00	0.06
Cement. 1/	0.94	0.06	0.06	.00	0.06	.00	.00	0.18
Bitumin.	0.93	0.07	0.07	0.00	0.04	0.03	.00	0.13
Polythene.	0.93	0.07	0.07	0.00	0.04	0.03	.00	0.13
3.0 TRANSPORT: a) Local Firms	0.33	0.66	0.66	0.00	0.33	0.33	0.01	1.00
(Trucks) b) Outside Firms	1.00	0.00	0.00	0.00	0.00	0.00	.00	0.01
4.0 LABOUR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highly Skilled.	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00
Skilled.	0.00	1.00	0.50	0.50	0.00	1.00	0.00	0.00
Unskilled.	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
5.0 BUILDING CONSTRUCTION								
Traditional (Indigenous) 2/	0.02	0.97	0.17	0.81	0.29	0.68	0.01	0.68
Intermediate 2/	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Modern (Imported) 2/	0.46	0.54	0.33	0.21	0.25	0.29	.00	0.49

1/ Based on summary calculations. (see relevant figure)

2/ Based on detailed calculations. (see relevant figure)

3/ Based on production & supply figures of aggregate

4/ Inputs without superscript based on interview estimates

6/ Coefficients averaged from different sawmill performances depending on ratio of battens to beam sales

Only battens sold	3.26	96.74	2.93	93.76	77.81	18.88	0.45
Only beams sold	11.38	88.62	15.88	72.32	64.22	23.98	0.23
Total	14.64	185.36	18.81	166.08	142.03	42.86	0.68
AVERAGE APPLIED	7.32	92.68	9.41	83.04	71.02	21.43	0.34

7/ Lahore.Rs28/kilo, Qabula Rs30/kilo.Source: Mohd. Ashraf, Qabula merchant
Stocked only in urban shops. Taxed similar to girders. Labour handling included in Rs2/profits

8/ Following equipment not calculated: From outside the district; Power generator (diesel, electric), rotary band saw. From within district; hand tools, formwork.

Fig:
(shadpr)

CONSTRUCTION INPUTS, SHADOW PRICES AND ADJUSTMENT FACTORS. 1982-83. (Rs.)

CONSTRUCTION INPUTS	Unit	Border Price.	Import Duties.	Federal Tax	Sub-sidies	Trans-port a/	Lahore Local Profit.a/	Market Price.a/	Shadow Price 1/	Adjustment Factor
d	f	h	j	k	l	m	n	p	q	s
		b/		c/						
1 Cement	50kgbag	41.65	30	25.00		15.00	2.50	72.50	47.5	-0.34
		d/	c/							
2 Steel Bars	1kg	3.50	32 40%	"		0.10	.80 .38	4.50	3.50	-0.22
		e/								
3 Coal	M.Ton	292.00			"			276.00	292.00	0.06
		f/						g/	f/	
4 Fuel (furnace) Oil	kg	1.05		"				2.50	1.05	-0.05
								h/	h/	
5 Diesel (high speed)	litre			"				1.00	0.88	-0.12
								h/	h/	
6 Labour (Rural, unskilled)	manday							1.00	0.80	-0.20

Production Cost *

a/ Interviews. & case-studies. For latter see relevant cash-flow analysis.
b/ Export Price, U.N. Commodity Trade Statistics, 1982:47
c/ National Housing Policy, (1982) Draft. Housing Finance section p.9
d/ Export price to Sri Lanka, Pakistan Foriegn Trade Statistics, 1982-83.
e/ After adjusting international price downwards to take account of difference between international and local coal quality in Btu. Quetta & Hyderabad (large lignite content) coal = to .7 & .3 ‡ international coal quality respectively. (U.N. Year Book of World Energy Statistics, p:xxiii) Ratio of use in brick kilns; Quetta:Hyderabad = 1:7. Import price Rs.833. (U.N. Commodity Trade Statistics, 1982:34)
f/ Inport Price, U.N. Commodity Trade Statistics. (1982:34) Ex. Refinery price = Rs.1.1/kg. (Pakistan Economic Survey, 1982-83:) Percentage difference between import and refinery price reflects difference between economic and financial, (market) prices. Adjustment factor taken from this percentage difference.
g/ Rs434/50gall.=Rs2.3/litre. (1 litre=.91kg, UN Yearbook of World Energy Statistics. 1980. xxviii)=Rs2.5/kg
h/ World Bank, (June 1981:5,26) Shadow Pricing for Project Appraisal, Pakistan. I. Tsakok. Premiums quoted, accepted here and directly transalated into adjustment factors.

* Production Cost = Market Price − (Tax + Transport + Profit)

1/ Shadow Price = Production cost + transport (for goods supplied thru domestic production)

Fig. (cnmninp) CONSTRUCTION & MAINTENANCE COSTS BY INPUTS: MATERIALS;LOCAL & NON-LOCAL. LABOUR;SKILLED & UNSKILLED

TECHNOLOGY	CONSTRUCTION Materials Local Total	%	Non-Local Total	%	Total	%	Labour Skilled Total	%	Unskilled Total	%	Total	%	TOTALS Mat.+Lab. (0%D.Rate) Financial	Economic
c	e	f	g	h	i	j	l	m	n	o	p	q	s	t
Indigenous	2258	55	0	0	2258	55	895	22	937	23	1832	45	4090	3903
Imported	6381	31	9122	45	15503	76	2920	14	1976	10	4896	24	20399	18061
~~% TOTAL~~ RATIO I/M													0.20	0.22

	MAINTENANCE (Undiscounted over 20 years) Materials Local Total	%	Non-Local Total	%	Total	Labour Skilled Total	%	Unskilled Total	%	Total	%	Mat.+Lab. Total	%	CONSTRUCTION + MAINTENANCE (discounted over 20 years) Totals 0%	10%	20%
														v	w	x
Indigenous	2901	26	0	0	2901	4019	36	4100	37	8119	74	11020	100	15110	8270	6322
Imported	792	15	2523	49	3315	1214	24	596	12	1810	35	5125	100	25524	21906	21015
~~% TOTAL~~ Ratio I/M														0.59	0.38	0.30

Economic or FC?

should this be 100%?

No.

Fig. COST-BENEFIT ANALYSIS: Effect of ECONOMIC ANALYSIS on Comparison between Indigenous and Imported Technologies.

PROCEDURE ===>	1: DISCOUNTING (below increases with increase in discount rate)	2: SHADOW PRICING 2.1: Materials	2.2: Exchange Rate	2.3:Labour	3: INCOME DISTRIBUTION
EFFECT ON COSTS: Economic (shadow) relative to Financial (market) costs: ===>	Reduced if costs are delayed.	Reduced if taxed inputs more than subsidised inputs.	Increased if Rupee overvalued relative to the Dollar.	Reduced if market wages higher than shadow wage.	Distribution effect increases with differential between shadow and market rates of inputs.
TECHNOLOGY TYPE	Whether CBA Favours or Disfavours Technology relative to its Substitute				
A: INDIGENOUS Technology	Costs delayed: Favours	Inputs unregulated: Neutral.	Inputs non-tradeable: Neutral.	Unskilled shadow wage higher: Favours	Only labour differential. Distribution small.
B: IMPORTED Technology	Costs Up-front: Disfavours.	Inputs taxed: Favours.	Inputs tradable. Rupees overvalued. Disfavours.	Unskilled workers fewer: Disfavours.	Labour & materials differential: Distribution large.

Fig. (cnswh1cf) SWITCHING CONSTRUCTION TECHNOLOGIES: Sun-Brick Walls, Timber Roof to Fired-Brick Walls, R.C. Roof.
INCOME GAINS & LOSSES among Input Suppliers: After First & Second Round of Payments
(Per Rs100 Construction Expenditures/Investment)

INTDTCH DISK

CONSTRUCTION TYPE ======> / INPUTS	INCOME GAINS AND LOSSES 1: First Round Payments A: INDIGENOUS Sun-Brick Walls, Timber Roof	B: IMPORTED Fired-Brick Walls, R.C. Roof	1: SWITCHING from A to B (Net Income Gains & Losses)	2: Second Round of Payments Local Coeff-icients	2: SWITCHING from A to B (Net Income Gains & Losses)
TOTAL EXPENDITURES	99.99	100.01	0.02		~~-5.21~~ -4.43 a/
MATERIALS + LABOUR COSTS			a/		
Contractors PROFIT(10%ofM+L)	9.09	9.09	0	1.00	0
1.0 MATERIALS	50.18	69.17	18.99		-25.33
1.1 Local	50.18	28.34	-21.84		-29.04
Straw, Dung, Grass	0.00	0.00	0.00	1.00	0.00
Earth, Clay	9.56	0.75	-8.81	1.00	-8.81
Sand	0.00	8.65	8.65	1.00	8.65
Wood Forms (Rental)	0.00	3.13	3.13	1.00	3.13
Reed Mats	5.01	0.00	-5.01	0.71	-3.56
Timber Beams,Battens	18.00	0.00	-18.00	0.99	-17.82
Sun-Bricks	17.61	0.00	-17.61	0.99	-17.43
Fired Bricks,Tiles,Ballast	0.00	15.81	15.81	0.43	6.80
1.2 Non-Local	0.00	40.83	40.83		3.71
Bitumin, Polythene	0.00	7.50	7.50	0.07	0.53
Aggregate	0.00	7.17	7.17	0.20	1.43
Cement	0.00	19.96	19.96	0.06	1.20
M.S.Bars 1/2"	0.00	6.20	6.20	0.09	0.56
2.0 LABOUR	40.72	21.75	-18.97		-18.97
Skilled	19.89	12.97	-6.92	1.00	-6.92
Unskilled	20.83	8.78	-12.05	1.00	-12.05

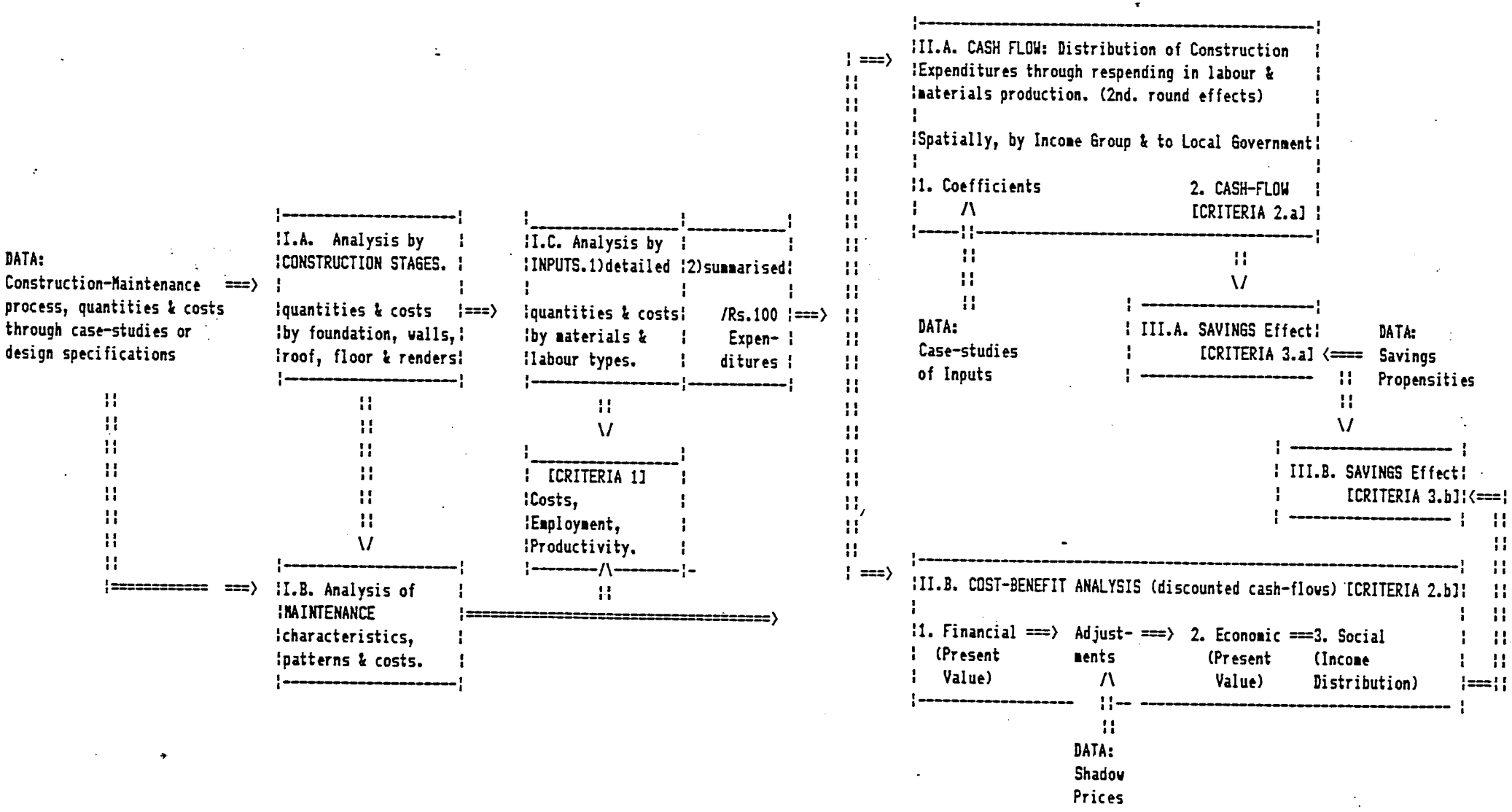
a/ Contractors maintain their percentage of profits hence the net effect is 0. Urban contractors, however, gain because they win contracts for construction using imported technologies. Rural builder-contractors lose because they can only handle projects using indigenous technologies.

Fig. TECHNOLOGY EVALUATION MODELS: LIST OF TEMPLATES.

Fig. No.	
I	CONSTRUCTION MODELS.
I.A.	Flow Chart of Model.
1.00	Construction Stages, Specifications, Costs and Duration
1.10	Indigenous Technology: Sun-Brick Walls, Timber Roof
1.20	Imported Technology: Fired Brick Walls, Reinforced Concrete Roof.
2.00	Construction and Maintenance Patterns and Costs.
2.10	Indigenous.
2.20	Imported
3.00	Construction Variables: Effects on Basic, CASH-FLOW and Savings Criteria.
3.10	Indigenous.
3.20	Imported.
4.00	Construction Variables: Effects on Basic, COST-BENEFIT and Savings Criteria.
4.10	Indigenous.
4.20	Imported.
5.00	SWITCHING From Indigenous to Imported Technologies: NET EFFECTS on Costs, Savings, Income Distribution, Employment and Labour Productivity.
5.10	Using CASH-FLOW Analysis.
5.20	Using COST-BENEFIT Analysis.
II.	PRODUCTION MODELS.
I.A.	Flow Chart of Model.
1.00	Production Variables: Effects on Basic, CASH-FLOW and Savings Criteria.
1.10	Indigenous: Wall Type, Agri- Waste Fired Brick Kiln.
1.20	Imported: Trench Type, Coal Fired Brick Kiln.
2.00	Production Variables: Effects on Basic, COST-BENEFIT and Savings Criteria.
2.10	Indigenous.
2.20	Imported.
3.00	SWITCHING From Indigenous to Imported Technologies: NET EFFECTS on Basic Criteria: Profitability (Financial and Economic), Capital and Labour Productivity, Employment.
4.00	SWITCHING From Indigenous to Imported Technologies: NET EFFECTS on Costs, Savings, Income Distribution, Employment and Labour Productivity.
4.10	Using CASH-FLOW Analysis.
4.20	Using COST-BENEFIT Analysis.
III.	PRODUCTION MODELS: Based on Summary Cash-Flow Analysis. Production Variables: Effects on Basic, CASH-FLOW and Savings Criteria.
1.00	Sun-Brick Production Unit.
2.00	Reed Roof-Mat Making Workshop.
3.10	Saw-Mill for Timber Beams and Battens. Batten Production.
3.20	as above Beams Production.
IV.	CASH-FLOW TEMPLATES: Based on Summary Analysis. Cash-Flow through Purchases of the Following:
1.00	Sand
2.00	Aggregate.
3.00	Cement.
4.00	Steel Reinforcing Rods.
5.00	Steel Girders.

Fig. Flow Chart of TECHNOLOGY EVALUATION MODEL: applied to CONSTRUCTION TECHNOLOGY

[cnmdl1:afshar]



	VARIABLES	QUANTITIES	MATERIALS			+		LABOUR				=	TOTAL	RATE Rs/100sf	
	I.A: Analysis By CONSTRUCTION STAGES & SPECIFICATIONS	sf,cf,kg x100	Type	Quantity /Unit	Cost (Rs) /Unit	Total	Type	Qty.(Man Days) /100cf	/2 Sk., 6 Unsk.	Cost(Rs) /Mday	Total	M + L	L	M + L
c	d	f	h	i	m	o	q	r	t	v	x	z	ab	ad	ae
		Input	Constant	Output	Input	Output	Constant	Output	Output	Input	Output	Output	Output		
	CRITERIA: ===> TOTALS	2.17				2260		Total:	85	11.01		1832	4092	844	1886
	% TOTALS	(sf)				55.23		Unsk:	62	100.00		44.77	100.00		
1.0	FOUNDATION & FOOTINGS: Sub-Tot.	2.41				189			12.5	1.72		258	447	107	185
	% Total	(cf)				4.62			14.68	15.63		6.30	10.92		
1.1	Excavation 1'6"x2'6"	2.41					Unskilled	1.05	2.5	0.42	15	38			
	(17.1-5,32,W2)														
1.2	Footings 18 " wide of	1.89	Earth (cf/100cf)	35	0.55	36	Skilled	1.50	2.8	1.42	40	113			
	sun-bricks in mud-mortar upto	1.89	Sun-bricks (#/100cf)	1350	0.06	153	Unskilled	3.75	7.1	1.18	15	106			
	ground level.(21.1,69,w13)														
2.0	WALLS Sub-Total	7.89				791			42	5.47		924	1715	117	217
	% Total	(cf)				19.33			49.17	49.64		22.59	41.92		
2.1	13.5" thick of sun-brick	7.89	Earth (cf/100cf)	35	0.55	152	Skilled	1.50	11.8	5.92	40	473			
	in mud-mortar(21.15,69,w13)	7.89	Sun-bricks (#/100cf)	1350	0.06	639	Unskilled	3.75	29.6	4.93	15	444			
2.2	Extra labour for archwork	0.10					Skilled	1.00	0.1	0.05	40	4			
	(21.2,66,w19)	0.10					Unskilled	2.00	0.2	0.03	15	3			
3.0	ROOF Sub-Total	2.50				1113			9	1.21		204	1317	82	527
	% Total	(sf)				27.21			10.79	10.95		4.98	32.19		
3.1	Mud roof of 4" mud	2.50	Straw (lbs/100sf)	34	Free	0	Skilled	0.33	0.8	0.41	40	33			
	& 1" mud plaster over	2.50	grass (sf/100sf)	100	Free	0	Unskilled	1.60	4.0	0.67	15	60			
	1 layer each of grass,	2.50	sarkanda (sf/100sf)	100	0.33	83									
	sarkanda & sirkee reed mats	2.50	sirkee (sf/100sf)	130	0.44	144									
	(NA,NA,W6)	2.50	Earth (cf/100sf)	55	0.55	76									
3.2	Providing, placing Beams (No.)	2.00	Accacia Beams	1	225.00	450	Skilled/6bms.	1.00	0.3	0.17	40	13			
	4"x8"x14'x2 = (cf)	6.10		1.2			Unskilled/6bms.	3.00	1.0	0.17	15	15			
	Providing, placing Battens.(No.)	45.00	Accacia Battens	1	8.00	360	Skilled/30btns.	1.00	1.5	0.75	40	60			
	(na,84,W79)*2.5"x3"x6'x45 = (cf)	13.95		1.2			Unskilled/30btns.	1.00	1.5	0.25	15	23			
4.0	FLOOR Sub-Total	2.17				99			5	0.54		95	194	44	89
	% Total	(sf)				2.42			6.39	4.93		2.31	4.74		
4.1	6"compacted earth with 1"	2.17	Straw (srs/100sf)	17	Free	0	Skilled	0.25	0.5	0.27	40	22			
	mud plaster and dung	2.17	Earth (cf/100sf)	82	0.55	98	Unskilled	2.25	4.9	0.81	15	73			
	finish (24.2,87,W20)	2.17	Dung (cf/100sf)	0.75	Free	0									
		2.17	Clay (cf/100sf)	0.75	0.75	1									
5.0	RENDERS Sub-Total	14.28				67			16	2.08		352	419	25	29
	% Total	(sf)				1.65			0.39	0.05		8.59	10.24		
5.1	0.5" mud plaster on walls:	14.28	clay (cf/100sf)	6	0.75	64	Skilled	0.17	2.4	1.21	40	97			
	internal:567sf,external:744sf	14.28	straw (srs/100sf)	8	Free	0	Unskilled	0.75	10.7	1.79	15	161			
	(25.7,97,w20)								0.0						
5.2	Dung plaster on walls & roof:	16.45	clay (cf/100sf)	0.25	0.75	3	Skilled	0.12	2.0	0.99	40	79			
	roof:217sf.(25.7,101,w34)	16.45	dung (cf/100sf)	0.25	Free	0	Unskilled	0.06	1.0	0.16	15	15			

VARIABLES	QUANTITY	MATERIALS					LABOUR						TOTAL	RATE (Rs/100sf)	
STAGES & SPECIFICATIONS c d	sf,cf,kg /100 Input \/	Type Constant	Quantity /Unit l	Total k	Cost /Unit Input \/	(Rs) Total n	Type Constant	Qty.(Man Days) /100 q	Total s	/ 28k., 2 6 Unsk. 6 t	u	Cost Mday \/	(Rs) Total x	Mat+Lab z	Labour L ab	Mat.+Lab 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 & FOOTINGS: Sub-Total	42.06					3259			25.0	5.6			673	3932	16	93
% Total	(cf)					15.90			16.92	13.75			3.29	19.19		
1.1 Excavation 2'6"*2'6". (17.1-5,32.W2)	3.90						Unskilled	1.05	4.1	0.7		20	82	82	210	210
1.2 Cement concrete bed 9"*2'6". Cem:Snd:Agg. 1:7:20.(20.1,52.v4)	1.17	Cement(cwt/Xcf)	4.50	5	72.50	382	Skilled	0.25	0.3	0.1		60	18			
	1.17	Sand(cf/Xcf)	39.00	46	4.00	183	Unskilled	5.50	6.4	1.1		20	129			
	1.17	Aggregate(cf/Xcf)	111	130	6.50	844	sub-total		6.7	1.2			146	1555	125	1329
		sub-total				1408										
1.3 Footings 9" thick of fired-bricks in cem:snd. mortar 1:7 upto flr.lvl. (21.1,64,w12)	1.89	Bricks(#/Xcf)	1350	2552	0.33	842	Skilled	2.00	3.8	1.9		60	227			
	1.89	Cement(cwt/Xcf)	3.00	6	72.50	411	Unskilled	4.80	9.1	1.5		20	181			
	1.89	Sand(cf/Xcf)	26.50	50	4.00	200	sub-total		12.9	3.4			408	1862	216	985
		sub-total				1453										
1.4 Damp proof course (d.p.c.) 1:2:4. 1.5" thick w/ 2 coats hot bitumin & polythene sheet .5 gauge. (na,59,w80)	0.44	Cement(cwt/Xsf)	2.25	1	72.50	72	Skilled	0.65	0.3	0.1		60	17			
	0.44	Sand(cf/Xsf)	5.50	2	4.00	10	Unskilled	2.25	1.0	0.2		20	20			
	0.44	Bitumin(lbs/Xsf)	34.00	15	17.80	266	sub-total		1.3	0.3			37	434	84	986
	0.44	Aggregate	11.00	5	6.50	31										
	(sf)	(cf/Xsf)														
	0.44	Polythene(sf/Xsf)	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 cem.snd. mortar 1:7 (21.1,64,w12)	4.92	Bricks(#/Xcf)	1350	6642	0.33	2192	Skilled	2.50	12.3	6.2		60	738			
	4.92	Cement(cwt/Xcf)	3	15	72.50	1070	Unskilled	5.58	27.5	4.6		20	549			
	4.92	Sand(cf/Xcf)	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 cement concrete (r.c.c.) cem.snd.agg. 1:2:4. w/ 2 ms bars (20.4,52,W4)	0.10	Cement(cwt/Xcf)	17.60	2	72.50	128	Skilled	1.00	0.1	0.1		60	6			
	0.10	Sand(cf/Xcf)	44.00	4	4.00	18	Unskilled	6.50	0.7	0.1		20	13			
	0.10	Aggregate(cf/Xcf)	88.00	9	6.50	57	Skilled/50kg	0.50	0.1	0.1		60	6			
	0.10	ms bars 3/8"(kg/Xkg)	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. a) preparing surface for r.c.c. incl. formwork of wood supports,brick, earth, & sand under-surfacing, 14 days in place.	0.91	Wood Formwork:Rented														
	2.50	1:Columns;Rs2/day/17days	6	6	34.00	204	Labour for Formwork Only:									
	(sf)	2:Beams;Rs2/day/17days	2	2	34.00	68	Skilled		2.00	1.0		60	120			
		3:Battens;Rs.5/day/17days	39	39	8.50	332	Unskilled		6.00	1.0		20	120			
		Bricks;1152w/288damaged	288	288	0.33	95	sub-total		8.00	2.0			240	/Xsf	96	423
		Earth;1.5"thick(cf)	35	35	0.55	19	Formwork:Materials+Labour=						1058			
		Sand;negligable					%/Total						5			
		Carriage				100										
		sub-total				818										
b) laying slabs incl. pouring,compacting, curing rendering. Cem:snd:agg: 1:2:4:(20.4,52,w4)	0.91	Cement(cwt/Xcf)	17.60	16	72.50	1161	Labour for formwork+laying slab:									
	0.91	Sand(cf/Xcf)	44.00	40	4.00	160	Skilled	12.00	10.9	5.5		60	654			
	0.91	Aggregate(cf/Xcf)	88.00	80	6.50	521	Unskilled	13.30	12.1	2.0		20	242			
	(cf)	sub-total				1842	sub-total		23.0	7.5			896	3556	985	3907
3.2 Fabricating mild steel (m.s.) reinforcing bars; cutting, bending, laying, jointing & fastening plus cost of bending wire, steel vastage & rust removal. (851,55,w5)	3.00	M.S.Bars1/2"0(kg/Xkg)	100	300	4.50	1350	Skilled	0.50	3.0	1.5		60	180			
	0.06	Binding wire(lbs/cwt)	0.25	0	?	0	Unskilled	0.50	3.0	0.5		20	60			
		sub-total				1350	sub-total		6.0	2.0			240	1590	80	530
3.3 Cement slab coated w/ 34 lbs. bitumin, sand blended, & polythene sheet covered w/ 4" earth & 1" mud plaster w/out strav, finished w/ fired clay tiles 9"*4.5"*2" grouted w/ cem.snd. mortar 1:3. (23.1,78,w25)	2.17	Cement(cwt/Xsf)	0.50	1	72.50	79	Skilled	1.25	2.7	1.4		60	163			
	2.17	Sand(cf/Xsf)	3.00	7	4.00	26	Unskilled	2.00	4.3	0.7		20	87			
	2.17	Earth(cf/Xsf)	55.00	119	0.55	66	sub-total		7.1	2.1			250	2238	115	1031
	2.17	Tiles(#/Xsf)	350	760	0.55	418										
	2.17	Bitumin(lbs/Xsf)	34.00	74	17.80	1313										
	2.17	Polythene (sf/Xsf)	100	217	0.40	87										
	(sf)	sub-total				1988										
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/Xsf)	70.00	152	0.55	84	Skilled	0.13	0.3	0.1		60	17			

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													
r.c.c. incl. formwork of		(sf)		2	Beams	Rs2/day/17days	2	2	34.00	68													
wood supports, brick,				3	Battens	Rs.5/day/17days	39	39	8.50	332													
earth, & sand under-					Bricks	152v/288damaged	288	288	0.33	95													
surfacing, 14 days in					Earth	1.5"thick(cf)	35	35	0.55	19													
place.					Sand	negligable																	
					Carriage					100													
						sub-total				818													
b) laying slabs incl.		0.91		Cement(cwt/Xcf)			17.60	16	72.50	1161	Labour for formwork+laying+slab:												
pouring, compacting, curing		0.91		Sand(cf/Xcf)			44.00	40	4.00	160	Skilled		12.00	10.9	5.5	60	654						
rendering. Cem:snd:aggt		0.91		Aggregate(cf/Xcf)			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		390
3.2 Fabricating mild steel		3.00		M.S.Bars	1/2"0(kg/Xkg)		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		53
laying, jointing &																							
fastening plus cost of																							
bending wire, steel																							
vastage & rust removal.																							
(851,55,w5)																							
3.3 Cement slab coated w/ 34		2.17		Cement(cwt/Xsf)			0.50	1	72.50	79	Skilled		1.25	2.7	1.4	60	163						
lbs. bitumin, sand		2.17		Sand(cf/Xsf)			3.00	7	4.00	26	Unskilled		2.00	4.3	0.7	20	87						
blended, & polythene		2.17		Earth(cf/Xsf)			55.00	119	0.55	66		sub-total		7.1	2.1		250		2238		115		103
sheet covered w/ 4"		2.17		Tiles(#/Xsf)			350	760	0.55	418													
earth & 1" mud plaster		2.17		Bitumin(lbs/Xsf)			34.00	74	17.80	1313													
w/out straw, finished w/		2.17		Polythene (sf/Xsf)			100	217	0.40	87													
fired clay tiles		(sf)				sub-total				1988													
9"X4.5"X2" 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		74
	% Total	(sf)								6.67				7.3	5.0		1.19		7.86				
4.1 Earth bed, moistened &		2.17		Earth(cf/Xsf)			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/Xcf)			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		60
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		44
dry rammed to 1.5"layer		(cf)		(cf/Xcf)																			
(20.1,51,w4)																							
4.4 Cement concrete bed,		0.28		Cement(cwt/Xcf)			17.60	5	72.50	357	Skilled		1.00	0.3	0.1	60	17						
1.5" w/cem:snd:aggt		0.28		Sand(cf/Xcf)			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/Xcf)			88.00	25	6.50	160		sub-total		2.1	0.4		53		620		190		221
						sub-total				567													
5.0 RENDERS	Total	16.40								944				35.0	10.7		1279		2222		78		13
	% Total	(sf)								4.61				23.7	26.1		6.24		10.85				
5.1 Cement pointing in		8.70		Cement(cwt/Xsf)			0.72	6	72.50	454	Skilled		1.00	8.7	4.4	60	522						
struck joints on walls		8.70		Sand(cf/Xsf)			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		14
(25.8,99.w33)																							
5.2 Cement plaster .5" thick		5.53		Cement(cwt/Xsf)			0.53	3	72.50	212	Skilled		0.75	4.1	2.1	60	249						
on walls interior.		5.53		Sand(cf/Xsf)			4.00	22	4.00	88	Unskilled		1.25	6.9	1.2	20	138						
cem:snd. 1:6		5.53				sub-total				301		sub-total		11.1	3.2		387		688		70		12
5.3 Cement plaster 3/8"		2.17		Cement(cwt/Xsf)			0.66	1	72.50	104	Skilled		0.75	1.6	0.8	60	98						
thick under slab		2.17		Sand(cf/Xsf)			2.55	6	4.00	22	Unskilled		1.25	2.7	0.5	20	54						
cem:snd. 1:3. (25.1-6,98,w32)		2.17				sub-total				126		sub-total		4.3	1.3		152		278		70		12

1·2 (cont)

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 % 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 25% of Walls, Roof & Floor	0.25											807											807
5.0 20 Yearly: Rebuild 50% 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	/Rs100 On Mnt. cb	CST.+MNT. /Rs100 cd	1: FINANCIAL ANALYSIS (0%) ci	(10%) cj	(20%) 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

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 / MAINTENANCE REQUIRED	YEARS ===> Input	Constr. Maintenance ===> 0 bc	1 bd	2 be	3 bf	4 bg	5 bh	6 bi	7 bj	8 bk	9 bl	10 bm	11 bn	12 bo	13 bp	14 bq	15 br	16 bs	17 bt	18 bu	19 bv	20 bw	TOTALS 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 by	/Rs100 On Maint ca	CST.+MNT /Rs100 cd
TOTALS (Rs)	100.00	20398					619					1676					619					2210	5125	100.00	100.00
1.0 Materials	76.00	15503					358					1098					358					1501	3314	64.67	73.73
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
Coal-FiredBricks,Tiles,Bllst	17.45	3560										42										261	303	5.91	15.13
1.2 Non-Local:(high imp./transp)	44.72	9122					321					876					321					1006	2523	49.23	45.63
Bitumin, Polythene	8.26	1684										140										140	280	5.46	7.69
Aggregate	7.91	1613					53					105					53					111	321	6.27	7.58
Cement	21.72	4430					268					496					268					616	1648	32.15	23.81
Steel bars	6.84	1395										135										139	274	5.35	6.54
2.0 Labour	24.00	4895					262					578					262					709	1811	35.33	26.27
2.1 Skilled	14.31	2920					178					392					178					467	1214	23.69	16.20
2.2 Unskilled	9.69	1976					84					186					84					243	596	11.64	10.08

1: FINANCIAL ANALYSIS

(0Z) cg	(10Z) ch	(20Z) ci
25523	21906	21015
18817	16457	15886
3309	2957	2873
3862	3614	3573
11645	9885	9440
1964	1759	1710
1935	1716	1658
6077	4943	4651
1669	1468	1420
6706	5449	5129
4134	3293	3078
2572	2156	2051

. INDIGENOUS CONSTRUCTION Technology 1: Sun - Brick Walls, Timber Roof.

tk2a Model of Variables & Effects on Basic, CASH - FLOW, & Savings Criteria

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
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		By Income Groups Up Y.	Low Y.	Local Govt.
	Urban	Rural			
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 1: 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/sf of Internal Space (Rs)	20.73
/Rs 100 Expenditure)	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	17.10	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	1.98	0.20	1.78	0.51	1.44	2.48	0.00	0.14
SAVINGS TOTAL			1.98		1.95		2.48	

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	COSTS (Rs) /Unit Input	Total	/100Rs
	c d		g		j	k
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

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

Criteria	Description	
1 Spatial Efficiency:	Internal Space/Built Area	0.83
2 Cost Effectiveness:	1) Internal Space/Rs100 (sf)	1.07
(Space & Employment Achieved /Rs 100 Expenditure)	Rs/sf of Internal Space (Rs	93.82
	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

	Costs /Rs100
	p 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	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
	0.00	1.00	1.00	0.00	1.00	0.00	0.00	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
	0.00	1.00	1.00	0.00	1.00	0.00	0.00	46.06	23.10	14.15	8.95	15.66	7.44	0.49
	0.00	1.00	0.00	1.00	0.50	0.50	0.00	9.01	19.33	10.38	8.95	12.38	6.95	0.42
	0.00	1.00	0.71	0.29	0.77	0.23	0.03	0.00	0.75	0.00	0.75	0.37	0.37	0.00
	0.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	8.65	6.14	2.51	6.66	1.99	0.26
	0.57	0.43	0.07	0.36	0.14	0.29	0.01	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
	0.93	0.07	0.07	0.00	0.04	0.03	0.00	37.05	3.78	3.78	0.00	3.28	0.49	0.07
	0.80	0.20	0.20	0.00	0.18	0.02	0.01	6.97	0.52	0.52	0.00	0.30	0.22	0.00
	0.94	0.06	0.06	0.00	0.06	0.00	0.00	5.73	1.43	1.43	0.00	1.29	0.14	0.07
	0.90	0.10	0.10	0.00	0.08	0.02	0.00	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	1.00	0.75	0.25	0.00	1.00	0.00	0.00	12.97	9.72	3.24	0.00	12.97	0.00
	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	8.78	0.00	8.78	0.00	8.78	0.00

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	5.50	4.61	0.90	0.72	0.42	1.57	0.00	0.10
SAVINGS TOTAL			5.50		1.14		1.57	

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 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
	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 if Project funds from:	a) Government				-0.83
	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

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

(mdtkim1)

II.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 (ZofM+L)			10.00	2047	9.09
10		\/				
11	1.0 MATERIALS				15574	69
12	1.1 Local (Low-import/Transp)				6382	28
13	Earth (cf)	306	1.50	0.55	168	0.75
14	Sand (cf)	487	2.38	4.00	1949	8.65
15	Wood Forms (17 days rent)				704	3.13
16	Coal-Fired Bricks (#)	9482	46.32	0.32	3034	13.48
17	Coal-Fired Roof Tiles(#)	760	3.71	0.55	418	1.86
18	Brick Ballast (cf)	31	0.15	3.50	109	0.48
19	1.2 Non - Local (Hi'Import/Transp)				9192	41
10	Bitumin (lbs)	89	0.43	17.80	1584	7.04
11	Polythene (sf)	261	1.28	0.40	104	0.46
12	Aggregate (cf)	248	1.21	6.50	1613	7.17
13	Cement (cwt,50kg,1bag)	62	0.30	72.50	4495	19.96
14	Mild-Steel Bars 1/2"0 (kg)	310	1.51	4.50	1395	6.20
15						
16	2.0 LABOUR (Man Days)	147	0.72		4896	22
17	0.1 Skilled	49	0.24	60.00	2920	12.97
18	0.2 Unskilled	99	0.48	20.00	1976	8.78

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TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

Criteria	Description	
1 Spatial Efficiency:	Internal Space/Built Area	0.83
2 Cost Effectiveness:	1) Internal Space/Rs100 (sf)	1.07
(Space & Employment Achieved /Rs 100 Expenditure)	Rs/sf of Internal Space (Rs)	93.82
	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)

I.C. INPUTS: Summarised For Cost-Benefit Analysis	Costs /Rs100	
o p	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	%

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

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. Bsns. Govt. ao	ap	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.	Dr 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

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

Construction Technology Type	Spatially: External District	Within District: Urban	Within District: Rural	By Income Group: Upper	By Income Group: Lower	Local Govt
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

s	X: Rs/sf u	Y: sf/Rs100 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)

z	Total ab	Unskilled 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: Urban	Within District: Rural	By Income Group: Upper	By Income Group: Lower	Local Govt
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

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.	or Low Y.		Govt.	
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

Fig. Flow Chart of TECHNOLOGY EVALUATION MODEL: applied to PRODUCTION TECHNOLOGY

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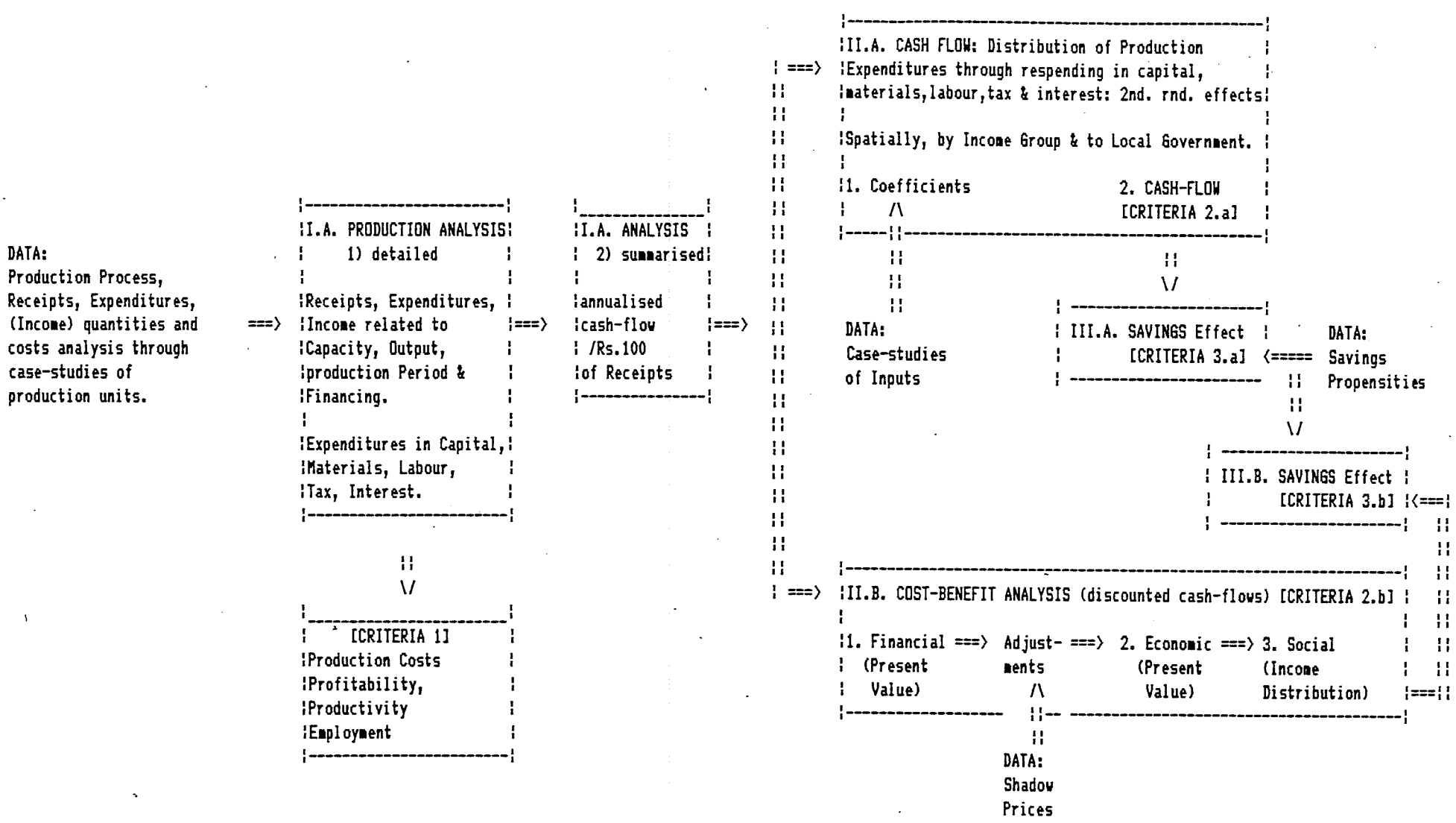

INDIGENOUS PRODUCTION Technology 1: Wall Type, Agri-Waste Fired, Brick Kiln.
Production Variables and their Effects on Basic, CASH - FLOW, & Savings Criteria.

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
d	f	g	h					
RECEIPTS	200			263	52600	210400	263.00	100.00
EXPENDITURES					44727	178908	223.63	85.03
INCOME					7873	31492	39.37	14.97

INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /kiln	/KBrs.	/Rs100	COSTS(Rs) /unit	/load	/year	/KBrs.	/Rs100
0.Capital	Input or Output			2923	453	1813	2.27	0.86
1.Plant				2134	331	1324	1.66	0.63
2.Equipment (#s)				789	122	489	0.61	0.23
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
0 Materials					32498	129992	162.49	61.78
1 Local (Lov 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
2 Transport (trucks)	42	0.21	0.08	370	15540	62160	77.70	29.54
	/kiln	Md/KBrs.	/Rs100	/unit	/load	/year	/KBrs.	/Rs100
0 Labour (#s,ManDays,Rs)	21	3.94	1.50		10850	43400	54.25	20.63
1 Skilled/Up.Y.(Rs/mth)	1	0.19	0.07	700	1050	4200	5.25	2.00
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
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.

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

CASH - FLOW FROM MATERIALS' PURCHASES. (Distribution of Receipts)

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

1: COEFFICIENTS of Distribution	Spatially Ext. Dst.		Income Groups Within District Urb.	Rur.	Up.Y.	Lo.Y.	Gvt.
	aa	ab	ad	ae	ag	ah	aj
Input							
A: RECEIPTS							
B: EXPENDITURES							
C: INCOME	0.00	1.00	0.25	0.75	0.50	0.50	0.00
B: INPUTS (EXPENDITURES)							
1.0.0 Capital	0.03	0.97	0.18	0.79	0.27	0.70	0.00
1.1.0 Plant	0.50	0.50	0.40	0.10	0.25	0.25	0.00
1.2.0 Equipment							
2.0.0 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 Transport(Trucks)	0.33	0.66	0.66	0.00	0.33	0.33	0.01
4.0 Labour							
4.1 Skilled/Up.Y.	0.00	1.00	0.00	1.00	1.00	0.00	0.00
4.2 Unskilled/Lo.Y	0.00	1.00	0.00	1.00	0.00	1.00	0.00
5.0 Miscellaneous							
Taxes	0.00	1.00	0.75	0.25	0.75	0.25	1.00
Interest	0.00	1.00	0.50	0.50	1.00	0.00	0.00

2: DISTRIBUTION of Receipts (From Materials' Expenditures)	Spatially External District		By Income Groups Within District Urban	Rural	Upper	Lower	Govt.
	an	ao	aq	ar	at	au	aw
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	14.97	3.74	11.23	7.48	7.48	0.00
B: INPUTS (EXPENDITURES)							
1.0.0 Capital	0.14	0.73	0.21	0.52	0.23	0.50	0.00
1.1.0 Plant	0.02	0.61	0.11	0.50	0.17	0.44	0.00
1.2.0 Equipment	0.12	0.12	0.09	0.02	0.06	0.06	0.00
2.0.0 Kiln Land	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	32.24	0.00	32.24	22.57	9.67	0.00
3.2 Transport(Trucks)	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	2.00	0.00	2.00	2.00	0.00	0.00
4.2 Unskilled/Lo.Y	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	0.67	0.50	0.17	0.50	0.17	0.67
Interest	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

IMPORTED PRODUCTION Technology 1: Trench-Rotary Type, Coal - Oil Fired Brick Kiln.

2) Model of Production Variables & their Effect on Basic, CASH - FLOW, & Savings Criteria

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. /load j	/year l	m	/KBrs o	/Rs100 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

INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /kiln	/KBrs.	/Rs100	COSTS(Rs) /unit	/load	/year	/KBrs.	/Rs100
	Inputs or Outputs \/							
.0.Capital				67460	1636	9815	4.09	1.35
.1.Plant				60000	1000	6000	2.50	0.83
.2.Equipment (#s)				7460	636	3815	1.59	0.52
.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
.0 Materials					86332	517992	215.83	71.23
.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
.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
.1 Skilled/Up.Y.(Rs/mth)	2	0.17	0.06	1550	2067	12400	5.17	1.71
.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
.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. CASH-FLOW FROM MATERIALS' PURCHASES: Distribution of Receipts; Spatially and by Income Groups

I.A.2) PRODUCTION ANALYSIS: Summary Two u	Annualised Cash Flow 0% /Rs100 w	1: COEFFICIENTS of Distribution Spatially Ext. Dst. aa	ab	Within District Urb. Rur. ad	ae	Income Group Up.Y.Lo.Y. ag	ah	Govt. aj	2: DISTRIBUTION of Receipts Spatially External District an	an	Within District Urban aq	Rural ar	Income Groups Upper at	Lower au	Local Govt. aw
		Input \/													
A RECEIPTS	100.00								56.67	43.33	7.43	35.88	15.26	28.07	0.56
B EXPENDITURES	97.46								56.67	40.79	5.75	35.04	12.72	28.07	0.56
C INCOME	2.54	0.00	1.00	0.66	0.33	1.00	0.00	0.00	0.00	2.54	1.68	0.84	2.54	0.00	0.00
B: INPUTS (Expenditures)															
1.0 Capital	1.35								0.59	0.76	0.37	0.38	0.30	0.46	0.00
1.1 Plant	0.83	0.40	0.60	0.20	0.40	0.20	0.40	0.00	0.33	0.50	0.17	0.33	0.17	0.33	0.00
1.2 Equipment	0.52	0.50	0.50	0.40	0.10	0.25	0.25	0.00	0.26	0.26	0.21	0.05	0.13	0.13	0.00
2.0 Kiln Land	0.62	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.62	0.00	0.62	0.62	0.00	0.00
3.0 Materials	71.23								56.07	15.16	3.44	11.72	9.92	5.23	0.17
3.1 Local:Low Import	11.72	0.00	1.00	0.00	1.00	0.70	0.30	0.00	0.00	11.72	0.00	11.72	8.20	3.52	0.00
3.2 Non-Local	59.51								56.07	3.44	3.44	0.00	1.72	1.72	0.17
Oil:incl.Trnsprt	17.19	0.80	0.20	0.20	0.00	0.10	0.10	0.01	13.75	3.44	3.44	0.00	1.72	1.72	0.17
Coal:excl.Trsprt	18.23	1.00	0.00	0.00	0.00	0.00	0.00	0.00	18.23	0.00	0.00	0.00	0.00	0.00	0.00
Transport: Coal	24.09	1.00	0.00	0.00	0.00	0.00	0.00	0.00	24.09	0.00	0.00	0.00	0.00	0.00	0.00
4.0 Labour	22.28								0.00	22.28	0.85	21.42	0.00	22.28	0.00
4.1 Skilled/Up.Y.	1.71	0.00	1.00	0.50	0.50	0.00	1.00	0.00	0.00	1.71	0.85	0.85	0.00	1.71	0.00
4.2 Unskilled/Lo.Y	20.57	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	20.57	0.00	20.57	0.00	20.57	0.00
5.0 Miscellaneous	1.98								0.00	1.98	1.09	0.89	1.88	0.10	0.39
5.1 Taxes	0.39	0.00	1.00	0.75	0.25	0.75	0.25	1.00	0.00	0.39	0.29	0.10	0.29	0.10	0.39
5.2 Interest	1.60	0.00	1.00	0.50	0.50	1.00	0.00	0.00	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 Urban	Rural	By Income Groups Upper	Lower	Local Govt.
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

Fig. (klagiml)

INDIGENOUS PRODUCTION Technology 1: Wall Type, Agri-Waste Fired, Brick Kiln.
Production Variables & Their Effects on Basic, COST - BENEFIT, & Savings Criteria.

I.A.1) 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	/load	/year	/KBrs	/Rs100
c	d	f	g	h	Input	l	I	o	p
A: RECEIPTS (Benefits)		200			263	52600	210400	263.00	100.00
B: EXPENDITURES (Costs)						44727	178908	223.63	85.03
C: INCOME(Net Present Values)						7873	31492	39.37	14.97

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /kiln	/KBrs.	/Rs100	COSTS(Rs) Input	/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.B: TECHNOLOGY CHOICE CRITERIA: EFFECT OF DISCOUNTING & SHADOW PRICING ON COSTS, BENEFITS & INCOME DISTRIBUTION.

I.A.2)PRODUCTION ANALYSIS: Summary Two.	Annualised Cash Flow /Rs100	II.B: COST - BENEFIT ANALYSIS. Discounted Over 5 Years: 1: FINANCIAL(Market Prices) 0%	10%	20%	Adjustment Factor(AF) Tradbl. Content	AF	Wtd. AF	2: ECONOMIC(Shadow Prices) 0%	10%	20%
t u	v	aa	ab	ac	ag	ah	ai	am	an	ao
A: RECEIPTS	100.00	500.00	379.08	299.06				500.00	379.08	299.06
B: EXPENDITURES	85.03	425.16	322.34	254.30		Inputs		400.68	303.78	239.66
C: INCOME	14.97	74.84	56.74	44.76				99.32	75.30	59.41
								19.86		11.88
B: INPUTS (EXPENDITURES)										
1.0.0 Capital	0.86	4.31	3.27	2.58				4.31	3.27	2.58
1.1.0 Plant	0.63	3.15	2.39	1.88				3.15	2.39	1.88
1.2.0 Equipment	0.23	1.16	0.88	0.70				1.16	0.88	0.70
2.0.0 Kiln Land	0.86	4.28	3.24	2.56				4.28	3.24	2.56
3.0 Materials	61.78	308.92	234.21	184.77				303.07	229.77	181.27
3.1 Local(Low Import)	32.24	161.20	122.21	96.42				161.20	122.21	96.42
3.2 Transport(Trucks)	29.54	147.72	111.99	88.35	0.33	-0.12	-0.04	141.87	107.56	84.86
4.0 Labour	20.63	103.14	78.19	61.69				84.51	64.07	50.54
4.1 Skilled/Up.Y.	2.00	9.98	7.57	5.97				9.98	7.57	5.97
4.2 Unskilled/Lo.Y	18.63	93.16	70.63	55.72	1.00	-0.2	-0.20	74.52	56.50	44.57
5.0 Miscellaneous	0.90	4.52	3.43	2.70				4.52	3.43	2.70
Taxes	0.67	3.33	2.52	1.99				3.33	2.52	1.99
Interest	0.24	1.19	0.91	0.71				1.19	0.91	0.71

III.B: TECHNOLOGY CHOICE CRITERIA 3.b.

Income Distribution	
Marginal Propensity to Save	Input==>>
SAVINGS DISTRIBUTION	
NET EFFECT ON SAVINGS if:	

ON Technology 1: Wall Type, Agri-Waste Fired, Brick Kiln.
s & Their Effects on Basic, COST - BENEFIT, & Savings Criteria.

ry One

ut	Description
\/	
200	200 K Bricks/30days/load. 9 loads/year 1800 K brick
4	4 loads/year. 800 K Bricks
6	6 months. December to June
372	CRF for 5 year loan at 25% interest

/. (K Bricks) ad			PRICE (Rs) /KBrs Input	/load	/year	/KBrs	/Rs100
f	g	h	\/	l	l	o	p
200			263	52600	210400	263.00	100.00
				44727	178908	223.63	85.03
				7873	31492	39.37	14.97

NTITIES In /KBrs.		/Rs100	COSTS(Rs) Input	/load	/year	/KBrs.	/Rs100
			\/				
Input or Output			2923	453	1813	2.27	0.86
::			2134	331	1324	1.66	0.63
\/			789	122	489	0.61	0.23
.6	0.003	0.001140	3000	450	1800	2.25	0.86
ad /Kbrs.		/Rs100	/unit	/load	/year	/KBrs.	/Rs100
				32498	129992	162.49	61.78
				16958	67832	84.79	32.24
14	0.0007	0.0003	3000	420	1680	2.10	0.80
6	0.03	0.01	20	120	480	0.60	0.23
00	3	1.14	0.67	402	1608	2.01	0.76
60	0.8	0.30	14	2240	8960	11.20	4.26
42	0.21	0.08	328	13776	55104	68.88	26.19
42	0.21	0.08	370	15540	62160	77.70	29.54
In Md/KBrs.		/Rs100	/unit	/load	/year	/KBrs.	/Rs100
21	3.94	1.50		10850	43400	54.25	20.63
1	0.19	0.07	700	1050	4200	5.25	2.00
20	3.75	1.43		9800	39200	49.00	18.63
18	3.38	1.28	43	8600	34400	43.00	16.35
2	0.38	0.14	800	1200	4800	6.00	2.28
			/KBr	476	1903	2.38	0.90
			7	350	1400	1.75	0.67
				126	503	0.63	0.24

C CRITERIA	/KBrs.	/Rs100
duction Cost/Unit Output	223.63	85.03
Return on Expenditures	39.37	14.97
apital Investment/Unit Output	2.27	0.86
apital Investment/Unit Employment(Md)		0.58
" " / " (Unskilled)	.	0.60
ays/Unit Output	3.94	1.50

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

II.B: COST - BENEFIT ANALYSIS. Discounted Over 5 Years

I.A.2) PRODUCTION ANALYSIS: Summary Two.		Annualised Cash Flow /Rs100	1: FINANCIAL (Market Prices) 0%	10%	20%	Adjustment Factor (AF) Tradbl. Content	AF	Wtd. AF	2: ECONOMIC (Shadow Prices) 0%	10%	20%	3: SOCIAL (Income Distribution) At 0% discount Proj.orCnsmr.	Bsnss.	Wrkr.	Govt.		Annual SOCIAL INCOME
t	u	v	aa	ab	ac	ag	ah	ai	am	an	ao	as	at	au	av	aw	ay
A:	RECEIPTS	100.00	500.00	379.08	299.06		Inputs		500.00	379.08	299.06						100.00
B:	EXPENDITURES	85.03	425.16	322.34	254.30		::		400.68	303.78	239.66						80.14
C:	INCOME	14.97 ==>	74.84	56.74	44.76 ==>		::	==>	99.32	75.30	59.41 ==>	-24.48	-24.48	0.00	18.63	5.85	19.86
							::										
							\/		19.86		11.88						
B:	INPUTS (EXPENDITURES)																
1.0.0	Capital	0.86	4.31	3.27	2.58				4.31	3.27	2.58						
1.1.0	Plant	0.63	3.15	2.39	1.88				3.15	2.39	1.88						
1.2.0	Equipment	0.23	1.16	0.88	0.70				1.16	0.88	0.70						
2.0.0	Kiln Land	0.86	4.28	3.24	2.56				4.28	3.24	2.56						
3.0	Materials	61.78 ==>	308.92	234.21	184.77 ==>			==>	303.07	229.77	181.27 ==>						
3.1	Local (Low Import)	32.24	161.20	122.21	96.42				161.20	122.21	96.42						
3.2	Transport (Trucks)	29.54	147.72	111.99	88.35	0.33	-0.12	-0.04	141.87	107.56	84.86	-5.85				5.85	
4.0	Labour	20.63	103.14	78.19	61.69				84.51	64.07	50.54						
4.1	Skilled/Up.Y.	2.00	9.98	7.57	5.97				9.98	7.57	5.97						
4.2	Unskilled/Lo.Y	18.63	93.16	70.63	55.72	1.00	-0.2	-0.20	74.52	56.50	44.57	-18.63			18.63		
5.0	Miscellaneous	0.90	4.52	3.43	2.70				4.52	3.43	2.70						
	Taxes	0.67	3.33	2.52	1.99				3.33	2.52	1.99						
	Interest	0.24	1.19	0.91	0.71				1.19	0.91	0.71						

III.B: TECHNOLOGY CHOICE CRITERIA 3.b. EFFECT ON SAVINGS \/

		At 0% Discount Proj.orCnsmr.	Bsnss.	Wrkr.	Govt.	NET SAVINGS
Income Distribution		-24.48 -24.48	0.00	18.63	5.85	
Marginal Propensity to Save	Input==>	0.2 0.20	0.15	0.00	0.20	
SAVINGS DISTRIBUTION		-4.90 -4.90	0.00	0.00	1.17	
NET EFFECT ON SAVINGS if:		a) Project Bears Economic Costs:				-3.73
		b) Consumer Bears Economic Costs:				-3.73

2.1 (cont)

Fig. (klcoimi) IMPORTED PRODUCTION Technology 1: Rotary - Trench Type, Coal - Oil Fired Brick Kiln.
Model of Production Variables & their Effects on BASIC, COST - BENEFIT, & SAVINGS CRITERIA

II.A: PRODUCTION ANALYSIS: 1) Summary One.

VARIABLES 1	Unit [Input]	Description						
1 Capacity; Bricks/load/year	\/	400	400 K bricks/30 days/load, 9 loads/year				3600 K bricks	
2 Output; Production Cycles		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. [Input]	/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 Value)					3082	18490	7.70	2.54	====>

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /kiln [Input or Output]	/KBrs.	/Rs100	COSTS(Rs) /unit [Input]	/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 (Lov 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

Criteria	Description	/KBrs.	/Rs100
1.0 Cost Minimisation	Production Cost/Unit Output	295.30	97.46
2.0 Profitability	Net Return on Expenditures	7.70	2.54
3.0 Capital Productivity	1) Capital Investment/Unit Output	4.09	1.35
	2) Capital Investment/Unit Employment(Mdays) Total		0.83
	" " / " Unskilled		0.86
4.0 Labour Productivity	Mandays/Unit Output	4.92	1.62

III.B: TECHNOLOGY CHOICE CRITERIA — EFFECTS OF D

	Annualised Cash Flov /Rs100			III.B: COST - FINANCIAL; 0%
I.A.2) PRODUCTION ANALYSIS: Summary Two	0%			0%
	v			aa
A RECEIPTS	100.00			500.00
B EXPENDITURES	97.46			487.29
C INCOME	2.54	===>		12.71
	/\			
B: INPUTS (Expenditures)				
1.0 Capital	1.35			6.75
1.1 Plant	0.83			4.13
1.2 Equipment (@s)	0.52			2.62
2.0 Kiln Land (Ac.)	0.62			3.09
3.0 Materials	71.23	===>		356.16
3.1 Local(Lov Import)	11.72			58.60
3.2 Non-Local(Hi'Import)	59.51			297.56
Oil(incl.Transport)	17.19			85.94
Coal(excl.Transport)	18.23			91.16
Transport(Coal Trucks)	24.09			120.46
4.0 Labour	22.28			111.39
4.1 Skilled/Up.Y.	1.71			8.53
4.2 Unskilled/Lo.Y	20.57			102.86
				0.00
5.0 Miscellaneous	1.98			9.90
5.1 Taxes	0.39			1.93
5.2 Interest	1.60			7.98

2.2 (cont)

EFFECTS OF DISCOUNTING & SHADOW PRICING

III.B: COST - BENEFIT ANALYSIS, Discounted Over 5 Years

1:FINANCIAL;Market Prices 0%	10%	20%		Adjustment Factor(AF) Tradbl. Content	AF	Wtd. AF		2: ECONOMIC(Shadow Prices) 0%	10%	20%		3: SOCIAL (Income Distribution) At 0% discount Proj.or	Cnsmr.	Bsnss.	Wrkr.	Govt.	SOCIAL INCOME/Yr
aa	ab	ac		ag	ah	ai		am	an	ao		as	at	au	av	av	ay
500.00	379.08	299.06			[Input]			500.00	379.08	299.06							100.00
487.29	369.44	291.46			||			463.12	351.12	277.00							92.62
12.71	9.64	7.60	==>		||		==>	36.88	27.96	22.06	==>	-24.17	-24.17	0.00	20.57	3.60	7.38
					\/												
	/\							7.38	/\	4.41				/\			
	||								||					||			
	||								||					||			
	||								||					||			
6.75	5.12	4.04						6.75	5.12	4.04							
4.13	3.13	2.47						4.13	3.13	2.47							
2.62	1.99	1.57						2.62	1.99	1.57							
3.09	2.35	1.85						3.09	2.35	1.85							
356.16	270.02	213.02	===>				===>	352.56	267.29	210.87	===>					3.60	
58.60	44.43	35.05						58.60	44.43	35.05							
297.56	225.60	177.98						293.96	222.87	175.82		-3.60				3.60	
85.94	65.16	51.40		1.00	-0.05	-0.05		81.64	61.90	48.83		-4.30				4.30	
91.16	69.11	54.52		1.00	0.06	0.06		96.62	73.26	57.79		5.47				-5.47	
120.46	91.33	72.05		0.33	-0.12	-0.04		115.69	87.71	69.20		-4.77				4.77	
111.39	84.45	66.62						90.81	68.85	54.32					20.57		
8.53	6.46	5.10						8.53	6.46	5.10							
102.86	77.98	61.52		1.00	-0.20	-0.20		82.29	62.39	49.22		-20.57			20.57		
0.00	0.00	0.00															
9.90	7.51	5.92						9.90	7.51	5.92							
1.93	1.46	1.15						1.93	1.46	1.15							
7.98	6.05	4.77						7.98	6.05	4.77							

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TECHNOLOGY CHOICE CRITERIA:	III.B: EFFECT ON SAVINGS At 20% Discount Proj.or	Cnsmr.	Bsnss.	Wrkr.	Govt.	NET SAVINGS
Income Distribution	-24.17	-24.17	0.00	20.57	3.60	
Marginal Propensity to Save:Input=>	0.20	0.20	0.15	0.00	0.20	
SAVINGS DISTRIBUTION	-4.83	-4.83	0.00	0.00	0.72	
NET EFFECT ON SAVINGS if:	a) Project Bears Economic Costs:					-4.11
	b) Consumer Bears Economic Costs:					-4.11

Fig. SWITCHING FROM INDIGENOUS TO IMPORTED PRODUCTION TECHNOLOGIES:
(pdswhbsc) 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)	
		At Discount Rates					Employment		
	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)	
		At Discount Rates					Employment		
	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

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 f	g	Within District: Urban i	Rural j	By Income Group: Upper Y. l	Lower Y. m	Govt. o
Net Income Distribution		46.79	-46.49	-16.64	-29.87	-28.36	-18.13	-0.40
Marginal Propensity to Save: Input=>		0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS DISTRIBUTION		4.68	-0.93	-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. 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

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

B: SAVINGS/LOSSES THRU BRICK PURCHASES	X	Y
	Rs/KBrs.	Brs/Rs100
m	Input	p
	\/	
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

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

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) (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.	Annualised Cash Flow /Rs100	1: COEFFICIENTS of Distribution Spatially Ext. Dst.	Within District Urb.	Within District Rur.	Income Groups Up.Y.	Income Groups Lo.Y.	Gvt.	2: DISTRIBUTION of Receipts (From Materials' Expenditures) Spatially External District	Within District Urban	Within District Rural	By Income Groups Upper Y.	By Income Groups Lower Y.	Local Govt.
u	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	Within District Rural	By Income Groups Upper Y.	By Income Groups 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

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Indigenous Production Technology 1: REED (Roof) MATS Making Workshop
Production Variables & Their Effects on CASH - FLOW, BASIC & SAVINGS CRITERIA.

A: 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'X3'=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. Indigenous Production Technology 1: SAW-MILL for Timber Beams & BATTENS
(swmm2a) 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	1875 cf	25 cf/tree	3 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.	QTY. cf /month			PRICE /$,cf	(Rs) /month	/year	/cf	/Rs100
c d	f	g	h	j	l	l	o	p
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

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /unit	/cf	/Rs100	COSTS(Rs) /unit	/mth/25d	/year	/cf	/Rs100
1.0.Capital				22320	186	2232	0.13	0.89
1.1.Plant: 1 room, 2 shelters				8000	67	800	0.05	0.32
1.2.Equipment ($s)				14320	119	1432	0.08	0.57
Electric Motor(20hp)				6000				
Saw. 3'3" dia.				8000				
Saw sharpener				320				
2.0.Land (Acres)	0.13	.000	ERR	8000	87	1040	0.06	0.42
	/month	/cf	/Rs100	/unit	/month	/year	/cf	/Rs100
3.0 Materials					20005	180045	10.81	72.09
3.1 Local (Low Import)					19650	176850	10.62	70.81
Accacia (25cf,25mnds)	75	0.04	0.27	250	18750	168750	10.00	67.57
(1tree=25cf=8cfbttns.								
&17cf fuel.10yrs.old)								
Electricity	0	0	ERR	0	800	7200	0.43	2.88
Grease for Saw	0	0	ERR	0	100	900	0.19	0.36
3.2 Non-Local(Import/Transp)	0	0	0	0	355	3195	0.19	1.28
Replace blade & belt				0	355	3195	0.19	1.28
	/unit	Md/25cf	/Rs100	/mday	/month	/year	/cf	/Rs100
4.0 Labour ($s,ManDays,Rs/mda	7	2.90	0.78		5450	49050	2.91	19.64
4.1 Skilled/first sawer	1	0.30	0.08	27	800	7200	0.43	2.88
4.2 Unskilled/Lo.Y	6	2.60	0.70	180	4650	41850	2.48	16.76
Second sawer	1	0.30		17	500	4500	0.27	1.80
Helper	1	0.30		13	400	3600	0.21	1.44
Tree Cutters/transp.$s,Rs	4	2.00	0.54	150	3750	33750	2.00	13.51
ContractRs2/cf;cut,transp								
					/month	/year	/cf	/Rs100
5.0 Miscellaneous					515	4639	0.27	1.86
Taxes(Rs/year) Local Govt					89	800	0.05	0.32
Interest(Rs/year)					427	3839	0.23	1.54

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

I.A.2) PRODUCTION ANALYSIS: Summary Two.	Annualised Cash Flow /Rs100		II.A: CASH - FLOW ANALYSIS; Spatially and by Income Group															
			1: COEFFICIENTS of Distribution								2: DISTRIBUTION of Receipts (From Materials' Purchases)							
			Spatially		Income Groups						Spatially		By Income Groups					
			Ext. Dst.		Within District				Gvt.		External District		Within District				Local Govt.	
					Urb.	Rur.	Up.Y.	Lo.Y.					Urban	Rural	Upper Y.	Lower Y.		
u	w		aa	ab	ad	ae	ag	ah	aj		an	ao	aq	ar	at	au	aw	
A: RECEIPTS	100.00										1.98	98.02	3.65	94.37	78.53	19.49	0.64	
B: EXPENDITURES	95.22										1.98	93.24	1.26	91.97	76.13	17.10	0.64	
C: INCOME	4.78	==>	0.00	1.00	0.50	0.50	0.50	0.50	0.00	==>	0.00	4.78	2.39	2.39	2.39	2.39	0.00	
B: INPUTS (EXPENDITURES)																		
1.0.Capital	0.89										0.70	0.19	0.06	0.13	0.06	0.13	0.00	
1.1.Plant	0.32		0.40	0.60	0.20	0.40	0.20	0.40	0.00		0.13	0.19	0.06	0.13	0.06	0.13	0.00	
1.2.Equipment	0.57		1.00	0.00	0.00	0.00	0.00	0.00	0.00		0.57	0.00	0.00	0.00	0.00	0.00	0.00	
		==>																
2.0.Land	0.42		0.00	1.00	0.00	1.00	1.00	0.00	0.00		0.00	0.42	0.00	0.42	0.42	0.00	0.00	
3.0 Materials	72.09									==>	1.28	70.81	0.00	70.81	70.81	0.00	0.00	
3.1 Local(Low Import)	70.81		0.00	1.00	0.00	1.00	1.00	0.00	0.00		0.00	70.81	0.00	70.81	70.81	0.00	0.00	
3.2 Non-Local	1.28		1.00	0.00	0.00	0.00	0.00	0.00	0.00		1.28	0.00	0.00	0.00	0.00	0.00	0.00	
4.0 Labour	19.64										0.00	19.64	0.00	19.64	2.88	16.76	0.00	
4.1 Skilled/Up.Y.	2.88		0.00	1.00	0.00	1.00	1.00	0.00	0.00		0.00	2.88	0.00	2.88	2.88	0.00	0.00	
4.2 Unskilled/Lo.Y	16.76		0.00	1.00	0.00	1.00	0.00	1.00	0.00		0.00	16.76	0.00	16.76	0.00	16.76	0.00	
5.0 Miscellaneous	2.18										0.00	2.18	1.19	0.98	1.96	0.21	0.64	
Taxes:Local Govt.	0.64		0.00	1.00	0.66	0.33	0.66	0.33	1.00		0.00	0.64	0.42	0.21	0.42	0.21	0.64	
Interest	1.54		0.00	1.00	0.50	0.50	1.00	0.00	0.00		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		By Income Groups			
		External District	Within District			Govt.	
			Urban	Rural	Upper Y.	Lower Y.	
Distribution of Receipts		1.98	98.02	3.65	94.37	78.53	19.49	0.64
Marginal Propensity to Save		0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		0.20	1.96	0.11	1.89	7.85	0.00	0.13
SAVINGS TOTAL:	2.16		2.16		2.00		7.85	0.13

	VARIABLES 1.	Unit	Description					
1	Capacity:cf/unit/month	1875	1875 cf	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.	QTY. cf /month			PRICE /$,cf	(Rs) /month	/year	/cf	/Rs100
c	d	f	g	h	j	l	l	o	p
A:	RECEIPTS (cf) 1tree=25cf	1875				27750	249750	14.80	100.00
	Battens: 8cf ($)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

	B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /unit	/cf	/Rs100	COSTS(Rs) /unit	/mth/25d	/year	/cf	/Rs100
1.0	Capital				22320	186	2232	0.13	0.89
1.1	Plant: 1 room, 2 shelters				8000	67	800	0.05	0.32
1.2	Equipment ($s)				14320	119	1432	0.08	0.57
	Electric Motor(20hp)				6000				
	Saw. 3'3" dia.				8000				
	Saw sharpener				320				
2.0	Land (Acres)	0.13	.000	ERR	8000	87	1040	0.06	0.42
		/month	/cf	/Rs100	/unit	/month	/year	/cf	/Rs100
3.0	Materials					20005	180045	10.81	72.09
3.1	Local (Low Import)					19650	176850	10.62	70.81
	Accacia (25cf,25mnds)	75	0.04	0.27	250	18750	168750	10.00	67.57
	(1tree=25cf=8cfbttns.								
	&17cf fuel.10yrs.old)								
	Electricity	0	0	ERR	0	800	7200	0.43	2.88
	Grease for Saw	0	0	ERR	0	100	900	0.19	0.36
3.2	Non-Local(Import/Transp)	0	0	0	0	355	3195	0.19	1.28
	Replace blade & belt				0	355	3195	0.19	1.28
		/unit	Md/25cf	/Rs100	/mday	/month	/year	/cf	/Rs100
4.0	Labour ($s,ManDays,Rs/mda	7	2.90	0.78		5450	49050	2.91	19.64
4.1	Skilled/first sawer	1	0.30	0.08	27	800	7200	0.43	2.88
4.2	Unskilled/Lo.Y	6	2.60	0.70	180	4650	41850	2.48	16.76
	Second sawer	1	0.30		17	500	4500	0.27	1.80
	Helper	1	0.30		13	400	3600	0.21	1.44
	Tree Cutters/transp.$s,Rs	4	2.00	0.54	150	3750	33750	2.00	13.51
	ContractRs2/cf;cut,transp								
						/month	/year	/cf	/Rs100
5.0	Miscellaneous					515	4639	0.27	1.86
	Taxes(Rs/year) Local Govt					89	800	0.05	0.32
	Interest(Rs/year)					427	3839	0.23	1.54

	TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA		/cf	/Rs100
1	Cost Minimisation:	Production Cost/Unit Output	14.18	94.90
2	Profitability:	Net Return on Expenditures	0.62	5.10
3	Capital Productivity:	1) Capital Investment/Unit Output	0.13	0.89
		2) Capital Investment/Unit Employment(Md)		1.14
		" " / " (Unskilled)		1.27
4	Labour Productivity:	Mandays/Unit Output	2.90	0.78

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

I.A.2) PRODUCTION ANALYSIS: Summary Two. u	Annualised Cash Flow /Rs100 0% w	I: COEFFICIENTS of Distribution Spatially: Ext. Dst. aa	ab	Within District: Urb. ad	ae	Rur. ag	ah	Income Groups: Up.Y. aj	Lo.Y.	Gvt.	II.A: CASH - FLOW ANALYSIS; Spatially and by Income Group 2: DISTRIBUTION of Receipts (From Materials' Purchases) Spatially: External District an	ao	Within District: Urban aq	Rural ar	By Income Groups: Upper Y. at	Lower Y. au	Govt. aw
A: RECEIPTS	100.00										1.98	98.02	3.65	94.37	78.53	19.49	0.64
B: EXPENDITURES	95.22										1.98	93.24	1.26	91.97	76.13	17.10	0.64
C: INCOME	4.78	==> 0.00	1.00	0.50	0.50	0.50	0.50	0.00		==>	0.00	4.78	2.39	2.39	2.39	2.39	0.00
B: INPUTS (EXPENDITURES)																	
1.0 Capital	0.89										0.70	0.19	0.06	0.13	0.06	0.13	0.00
1.1 Plant	0.32	0.40	0.60	0.20	0.40	0.20	0.40	0.00			0.13	0.19	0.06	0.13	0.06	0.13	0.00
1.2 Equipment	0.57	1.00	0.00	0.00	0.00	0.00	0.00	0.00			0.57	0.00	0.00	0.00	0.00	0.00	0.00
		==>															
2.0 Land	0.42	0.00	1.00	0.00	1.00	1.00	0.00	0.00			0.00	0.42	0.00	0.42	0.42	0.00	0.00
3.0 Materials	72.09									==>	1.28	70.81	0.00	70.81	70.81	0.00	0.00
3.1 Local(Low Import)	70.81	0.00	1.00	0.00	1.00	1.00	0.00	0.00			0.00	70.81	0.00	70.81	70.81	0.00	0.00
3.2 Non-Local	1.28	1.00	0.00	0.00	0.00	0.00	0.00	0.00			1.28	0.00	0.00	0.00	0.00	0.00	0.00
4.0 Labour	19.64										0.00	19.64	0.00	19.64	2.88	16.76	0.00
4.1 Skilled/Up.Y.	2.88	0.00	1.00	0.00	1.00	1.00	0.00	0.00			0.00	2.88	0.00	2.88	2.88	0.00	0.00
4.2 Unskilled/Lo.Y	16.76	0.00	1.00	0.00	1.00	0.00	1.00	0.00			0.00	16.76	0.00	16.76	0.00	16.76	0.00
5.0 Miscellaneous	2.18										0.00	2.18	1.19	0.98	1.96	0.21	0.64
Taxes:Local Govt.	0.64	0.00	1.00	0.66	0.33	0.66	0.33	1.00			0.00	0.64	0.42	0.21	0.42	0.21	0.64
Interest	1.54	0.00	1.00	0.50	0.50	1.00	0.00	0.00			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	By Income Groups: Upper Y.	Lower Y.	Govt.
Distribution of Receipts		1.98	98.02	3.65	94.37	78.53	19.49	0.64
Marginal Propensity to Save		0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		0.20	1.96	0.11	1.89	7.85	0.00	0.13
SAVINGS TOTAL:	2.16		2.16		2.00		7.85	0.13

Fig. Indigenous Production Technology 1: SAW-MILL for TIMBER Beams & Battens
(swmia2) 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	1875 cf 50 cf/tree1.5 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.	QTY. cf /month			PRICE /ft,cf	(Rs) /month	/year	/cf	/Rs100
c d	f	g	h	j	l	l	o	p
A: RECEIPTS (cf) 1tree=50cf	1875				54621	491588	29.13	100.00
Beams:15cf/tree(#)1=3.05cf	184			225	41496	373463.	703.13	75.97
Fuelwood: 35cf (cf)	1313			10	13125	118125	10.00	24.03
B: EXPENDITURES					31868	287631	17.18	58.51
C: INCOME					22753	203957	11.95	41.49

B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /unit /cf		/Rs100	COSTS(Rs) /unit	/mth/25d	/year	/cf	/Rs100
1.0.Capital				22320	186	2232	0.13	0.45
1.1.Plant: 1 room, 2 shelters				8000	67	800	0.05	0.16
1.2.Equipment (#s)				14320	119	1432	0.08	0.29
Electric Motor(20hp)				6000				
Saw. 3'3" dia.				8000				
Saw sharpener				320				
2.0.Land (Acres)	0.13	.000	ERR	8000	87	1040	0.06	0.21
	/month	/cf	cf/Rs100	/unit	/month	/year	/cf	/Rs100
3.0 Materials					25630	230670	13.81	46.92
3.1 Local (Lov Import)					25275	227475	13.62	46.27
Accacia Trees(50cf,50mnds)	38	0.02	0.07	650	24375	219375	13.00	44.63
(1tree=50cf=15cfbttns.&								
35cf fuel.18yrs.old)								
Electricity	0	0	ERR	0	800	7200	0.43	1.46
Grease for Saw	0	0	ERR	0	100	900	0.19	0.18
3.2 Non-Local(Import/Transp)	0	0	0	0	355	3195	0.19	0.65
Replace blade & belt				0	355	3195	0.19	0.65
	/unit	Md/25cf	/Rs100	/mday	/month	/year	/cf	/Rs100
4.0 Labour (#s,ManDays,Rs/mday)	7	2.90	0.40		5450	49050	2.91	9.98
4.1 Skilled/first sawer	1	0.30	0.04	27	800	7200	0.43	1.46
4.2 Unskilled/Lo.Y	6	2.60	0.36	180	4650	41850	2.48	8.51
Second sawer	1	0.30		17	500	4500	0.27	0.92
Helper	1	0.30		13	400	3600	0.21	0.73
Tree Cutter/trnsp.#s,Rs/cf	4	2.00	0.27	150	3750	33750	2.00	6.87
ContractRs2/cf;cut,transp)								
					/month	/year	/cf	/Rs100
5.0 Miscellaneous					515	4639	0.27	0.94
Taxes(Rs/year) Local Govt.					89	800	0.05	0.16
Interest(Rs/year)					427	3839	0.23	0.78

TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA

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

I.A.2a) PRODUCTION ANALYSIS: Summary Two. u	Annualised Cash Flow /Rs100 w	II.A CASH - FLOW ANALYSIS; Spatially and by Income Group. I: COEFFICIENTS of Distribution Spatially Ext. Dst. aa	ab	Within District Urb. ad	Rur. ae	Income Groups Up.Y. aq	Lo.Y. ah	Gvt. aj	2: DISTRIBUTION of Receipts (From Materials' Expenditures) Spatially External District an	Within District Urban aq	Rural ar	By Income Groups Upper Y. at	Lower Y. au	Govt. aw
	0%													
A: RECEIPTS	100.00								1.01	98.99	21.30	77.69	69.64	29.35	0.33
B: EXPENDITURES	58.67								1.01	57.67	0.64	57.03	48.98	8.69	0.33
C: INCOME	41.33	==> 0.00	1.00	0.50	0.50	0.50	0.50	0.00	0.00	41.33	20.66	20.66	20.66	20.66	0.00
B: INPUTS (EXPENDITURES)															
1.0.Capital	0.45								0.36	0.10	0.03	0.07	0.03	0.07	0.00
1.1.Plant	0.16	0.40	0.60	0.20	0.40	0.20	0.40	0.00	0.07	0.10	0.03	0.07	0.03	0.07	0.00
1.2.Equipment	0.29	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00
2.0.Land	0.21	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.21	0.00	0.21	0.21	0.00	0.00
3.0 Materials	46.92								0.65	46.27	0.00	46.27	46.27	0.00	0.00
3.1 Local:Low Import	46.27	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	46.27	0.00	46.27	46.27	0.00	0.00
3.2 Non-Local	0.65	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	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	0.00
4.1 Skilled/Up.Y.	1.46	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	1.46	0.00	1.46	1.46	0.00	0.00
4.2 Unskilled/Lo.Y	8.51	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	8.51	0.00	8.51	0.00	8.51	0.00
5.0 Miscellaneous	1.11								0.00	1.11	0.61	0.50	1.00	0.11	0.33
Taxes:Local Govt	0.33	0.00	1.00	0.66	0.33	0.66	0.33	1.00	0.00	0.33	0.21	0.11	0.21	0.11	0.33
Interest	0.78	0.00	1.00	0.50	0.50	1.00	0.00	0.00	0.00	0.78	0.39	0.39	0.78	0.00	0.00

TECHNOLOGY CHOICE CRITERIA 3.a: EFFECT ON SAVINGS

III.A: SAVINGS ANALYSIS		Spatially External District	Within District		By Income Groups Upper Y.	Lower Y.	Govt.
			Urban	Rural			
Distribution of Receipts		1.01	21.30	77.69	69.64	29.35	0.33
Marginal Propensity to Save		0.10	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		0.10	0.64	1.55	6.96	0.00	0.07
SAVINGS TOTAL:	2.08	2.08		2.19		6.96	0.07

	VARIABLES 1.	Unit	Description								
10	1 Capacity:cf/unit/month	1875	1875 cf	50 cf/tree1.5 Trees/day,							
11	2 Output: Production Period	1875	9 months	16875	cf/year Sept. to June						
12	3 Production Period	9	9 months. September to June								
13	4 Financing	0.372	CRF for	5 year loan at 25% interest							

	VARIABLES 2.	QTY. cf /month			PRICE /ft,cf	(Rs) /month	/year	/cf	/Rs100
c	d	f	g	h	j	l	l	o	p
21	A: RECEIPTS (cf) 1tree=50cf	1875				54621	491588	29.13	100.00
22	Beams:15cf/tree($)1=3.05cf	184			225	41496	373463.	703.13	75.97
23	Fuelwood: 35cf (cf)	1313			10	13125	118125	10.00	24.03
24									
25	B: EXPENDITURES					31868	287631	17.18	58.51
26	C: INCOME					22753	203957	11.95	41.49

	B: INPUTS (EXPENDITURES) VARIABLES 3.	QUANTITIES /unit	/cf	/Rs100	COSTS(Rs) /unit	/mth/25d	/year	/cf	/Rs100
33	1.0.Capital				22320	186	2232	0.13	0.45
34	1.1.Plant: 1 room, 2 shelters				8000	67	800	0.05	0.16
35	1.2.Equipment ($s)				14320	119	1432	0.08	0.29
36	Electric Motor(20hp)				6000				
37	Saw. 3'3" dia.				8000				
38	Saw sharpener				320				
39									
40	2.0.Land (Acres)	0.13	.000	ERR	8000	87	1040	0.06	0.21
41									
42		/month	/cf	cf/Rs100	/unit	/month	/year	/cf	/Rs100
43	3.0 Materials					25630	230670	13.81	46.92
44	3.1 Local (Lov Import)					25275	227475	13.62	46.27
45	Accacia Trees(50cf,50mnds)	38	0.02	0.07	650	24375	219375	13.00	44.63
46	(1tree=50cf=15cfbttns.&								
47	35cf fuel.18yrs.old)								
48	Electricity	0	0	ERR	0	800	7200	0.43	1.46
49	Grease for Saw	0	0	ERR	0	100	900	0.19	0.18
50	3.2 Non-Local(Import/Transp)	0	0	0	0	355	3195	0.19	0.65
51	Replace blade & belt				0	355	3195	0.19	0.65
52									
53		/unit	Md/25cf	/Rs100	/mday	/month	/year	/cf	/Rs100
54	4.0 Labour ($s,ManDays,Rs/mday)	7	2.90	0.40		5450	49050	2.91	9.98
55	4.1 Skilled/first sawer	1	0.30	0.04	27	800	7200	0.43	1.46
56	4.2 Unskilled/Lo.Y	6	2.60	0.36	180	4650	41850	2.48	8.51
57	Second sawer	1	0.30		17	500	4500	0.27	0.92
58	Helper	1	0.30		13	400	3600	0.21	0.73
59	Tree Cutter/trnsp.$s,Rs/cf	4	2.00	0.27	150	3750	33750	2.00	6.82
60	ContractRs2/cf;cut,transp)								
61						/month	/year	/cf	/Rs100
62	5.0 Miscellaneous					515	4639	0.27	0.94
63	Taxes(Rs/year) Local Govt.					89	800	0.05	0.16
64	Interest(Rs/year)					427	3839	0.23	0.78

	TECHNOLOGY CHOICE CRITERIA 1: BASIC CRITERIA		/cf	/Rs100
69	1 Cost Minimisation:	Production Cost/Unit Output	17.18	58.51
70	2 Profitability:	Net Return on Expenditures	11.95	41.49
71	3 Capital Productivity:	1) Capital Investment/Unit Output	0.13	0.45
72		2) Capital Investment/Unit Employment(Md)		1.14
73		" " / " (Unskilled)		1.27
74	4 Labour Productivity:	Mandays/Unit Output	2.90	0.40

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

I.A.2a) PRODUCTION ANALYSIS: Summary Two. u	Annualised Cash Flow /Rs100 % w		1: COEFFICIENTS of Distribution Spatially Ext. Dst. aa	ab	Within District Urb. Rur. ad	ae	Income Groups Up.Y.Lo.Y. ag	ah	Govt. aj		2: DISTRIBUTION of Receipts (From Materials' Expenditures) Spatially External District an	Within District Urban aq	Rural ar	By Income Groups Upper Y. at	Lower Y. au	Govt. aw
A: RECEIPTS	100.00										1.01	98.99	21.30	77.69	69.64	29.35	0.33
B: EXPENDITURES	58.67										1.01	57.67	0.64	57.03	48.98	8.69	0.33
C: INCOME	41.33	==>	0.00	1.00	0.50	0.50	0.50	0.50	0.00	==>	0.00	41.33	20.66	20.66	20.66	20.66	0.00
B: INPUTS (EXPENDITURES)																	
1.0.Capital	0.45										0.36	0.10	0.03	0.07	0.03	0.07	0.00
1.1.Plant	0.16		0.40	0.60	0.20	0.40	0.20	0.40	0.00		0.07	0.10	0.03	0.07	0.03	0.07	0.00
1.2.Equipment	0.29		1.00	0.00	0.00	0.00	0.00	0.00	0.00		0.29	0.00	0.00	0.00	0.00	0.00	0.00
2.0.Land	0.21		0.00	1.00	0.00	1.00	1.00	0.00	0.00		0.00	0.21	0.00	0.21	0.21	0.00	0.00
3.0 Materials	46.92									==>	0.65	46.27	0.00	46.27	46.27	0.00	0.00
3.1 Local:Low Import	46.27		0.00	1.00	0.00	1.00	1.00	0.00	0.00		0.00	46.27	0.00	46.27	46.27	0.00	0.00
3.2 Non-Local	0.65		1.00	0.00	0.00	0.00	0.00	0.00	0.00		0.65	0.00	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	0.00
4.1 Skilled/Up.Y.	1.46		0.00	1.00	0.00	1.00	1.00	0.00	0.00		0.00	1.46	0.00	1.46	1.46	0.00	0.00
4.2 Unskilled/Lo.Y	8.51		0.00	1.00	0.00	1.00	0.00	1.00	0.00		0.00	8.51	0.00	8.51	0.00	8.51	0.00
5.0 Miscellaneous	1.11										0.00	1.11	0.61	0.50	1.00	0.11	0.33
Taxes:Local Govt	0.33		0.00	1.00	0.66	0.33	0.66	0.33	1.00		0.00	0.33	0.21	0.11	0.21	0.11	0.33
Interest	0.78		0.00	1.00	0.50	0.50	1.00	0.00	0.00		0.00	0.78	0.39	0.39	0.78	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		1.01	98.99	21.30	77.69	69.64	29.35	0.33
Marginal Propensity to Save		0.10	0.02	0.03	0.02	0.10	0.00	0.20
SAVINGS Distribution		0.10	1.98	0.64	1.55	6.96	0.00	0.07
SAVINGS TOTAL:	2.08		2.08		2.19		6.96	0.07

III 3.2 (cont)

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	

1.0

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				Govt.		Spatially		By Income Groups				Govt.
Ext. Dst.		Within District						External	District	Within District				
		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.

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				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
							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	1.00	1.00	0.00	1.00	0.00	0.00	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

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

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

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	a	o	p	r	s	u		y	z	ab	ac	ae	af	ah	
A									91.33	8.67	8.67	0.00	8.43	0.24	0.06	
B									91.33	0.28	0.28	0.00	0.04	0.24	0.06	
C	0.00	1.00	1.00	0.00	1.00	0.00	0.00	===>	0.00	8.39	8.39	0.00	8.39	0.00	0.00	
1.0	1.00	0.00	0.00	0.00	0.00	0.00	0.00		91.33	0.00	0.00	0.00	0.00	0.00	0.00	
1.1																
1.2																
1.3																
2.0									0.00	0.28	0.28	0.00	0.04	0.24	0.06	
2.1	0.00	1.00	1.00	0.00	0.66	0.33	1.00		0.00	0.06	0.06	0.00	0.04	0.02	0.06	
2.2	0.00	1.00	1.00	0.00	0.00	1.00	0.00		0.00	0.22	0.22	0.00	0.00	0.22	0.00	

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