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LIST OF PROJECTS PROPOSALS SUBMITTED BY FIFTH COURSE PARTICIPANTS

1. Rajfulbaria Cooperative Poultry Project
by Mr Mohd. Nurul Hoque, Bangladesh.
2. Sanhe Cooperative Chicken Feed Plant
by Mr Rong Jun, China.
3. Integrated Chinese Onion Project
by Mr Huang Yadong, China.
4. Fruit Processing Unit at Narkhed,
by Mr Ziley Singh, India.
5. Cotton Processing and Marketing Project,
by Mr Raj Pal Gaba, India.
6. Red Pepper Powder Plant Project,
by Mr Shin Kie Yup, Korea.
7. Meat Processing Mill
by Mr Kyu Hyun Lee, Korea.
8. Integrated Sheep Rearing and Marketing Project
by Mr Ku Mohamad Rodzi, Malaysia
9. Cotton Ginning Pressing and Oil Extraction Mill
by Mr Islam Madni, Pakistan
10. Small Farmers Integrated Marketing Cooperative
Project by Ms Amelita Provided, Philippines.
11. Integrated Paddy Processing and Marketing Project
by Ms Edith Susan Valdez, Philippines
12. Modernisation of Dessicated Coconut Factory,
by Mr M.B.R.Perera, Sri Lanka
13. Dessicated Coconut Processing Factory:
Modernisation Programme : By Mr C.A.C.Fernando,
Sri Lanka.
14. Processing Plant for Feed Mix Mill Project
by Ms Maroum Sutanun, Thailand.

Integrated Farming Project
by Mr Surya Thummavaro, Thailand.

Fifth ICA/Japan Training Course for
Strengthening Management of
Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: RAJFULBARIA COOPERATIVE POULTRY PROJECT
<i>COUNTRY</i>	: BANGLADESH
<i>PROJECT PREPARED BY</i>	: MD. NURUL HOQUE, MANAGER BANGLADESH SAMABAYA BANK LIMITED.

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

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ACKNOWLEDGEMENT

This project report has been prepared as an integral part of the 5th ICA Training Programme. Special care has been taken during data/information collection.

The expertise developed through training course held in New Delhi has been helpful in this task. Therefore, I am grateful to the ICA authority as well as the faculty members of the I.I.M. India.

I am also grateful to the following persons for their help and cooperation :-

1. Mr. Md. Habibur Rahman Sarker,
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2. Mr. Al-haz Liaqut Ali,
Chairman, Bangladesh Jatiya Samabaya Union.
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CHAPTER - 1.0

S U M M A R Y

1. Name & address of the project. : RAJFULBARIA COOPERATIVE
POULTRY PROJECT.
Village: Rajfulbaria,
Post : Rajfulbaria,
Upazila: Savar,
Dist. : Dhaka, Bangladesh.
2. Project Area : Tetulzora Union.
3. Total initial investment : Taka 1,08,70,250
4. Total estimated cost (including interest during construction) : Taka 1,10,95,250
5. Source of funds : Share capital, aids, grants & debt.
6. Debt/equity ratio : 80 : 20
7. Installed capacity : 20,000 Birds (1,20,000 birds yearly)
8. Capacity utilization : 100%
9. Product/By-product : Broiler.
10. Implementation schedule & period : 10 months.
11. Organisation & Management: Board of Directors
12. Operational Management : Total 21 staff headed by Manager
13. Origin of Machine : Local
14. Economic life of the project : 10 years
15. Source of raw materials : Society/Local farmers
16. Target group : Farmers member of Tetulzora Union.

CHAPTER-2.

2.0 Background:

Bangladesh is a developing country. It expresses its indentity over a land of 55,598 sq. miles with a population of 110 million of her breast. It is pre-dominantly an agricultural one. About 85% population of the country depend on agriculture for their livelihood. In agriculture sector, seasonal un-employment is a common issue. The farmers are not getting remunerative prices of their produces due to lack of proper marketing system. Moreover, they are being exploited by the village money lenders as well as dishonest traders. In such way the farmers are losing their land and the number of landless farmers are increasing day by day. To face such situation and save the farmers from landlessness there is need of implementation of agricultural projects which may create employment opportunities as well as add additional value to their produces giving remunerative prices of their produces. Keeping the above view in mind, I have identified this poultry project to implement by the farmers on cooperative basis.

2.1 Overall situation:

In Bangladesh food crisis/nutrition shortage is one of the major problems. Although, some food items like powder milk, rice, wheat, edible oil etc. are imported to meet the requirements there remains shortage of the food like beef, mutton, chicken, eggs etc.

There are a few poultry farms which are quite insignificant to meet the total requirement of the country.

Overall situation of the project area:

The over all situation of the project area is given below :

- Area of Tetulzore Union	:	42.25 sq.km.
- Total population	:	21,825
- Farmer house-hold	:	3,246
Cultivable land	:	4,050 acres
- one crop area	:	405 acres
- Two crop area	:	2025 acres
- Three crop area	:	1620 acres

2.2 Production:

- Paddy	:	14,490 MT
- Wheat	:	15,525 MT
- Pulses	:	517.50 MT
- Oil seeds	:	567.00 MT
- Vegetables	:	3,450 MT

The project area is purely agricultural and there are some promotional organisations like Savar Dairy Farm and Farmer Training Institute in the area.

2.3 Availability of Agricultural Produces:

This Tetulzora Union i.e. project area has been experiencing surplus in respect of all produces. The production of paddy, wheat, oil seeds, pulses and vegetables of last five years are shown below :-

<u>Production</u>	<u>Year 1989-90</u>	<u>Year 1988-89</u>	<u>Year 1987-88</u>	<u>Year 1986-87</u>	<u>Year 1985-86</u>
1. Paddy	14490	14030	12130	13300	11500
2. Wheat	1552.5	1340	1440	1150	1570
3. Oil seeds	567	430	516	510	508
4. Pulses	517	477	488	500	400
5. Vegetables	3450	3400	3040	3110	2110
Total:	20577.5	19677	17614	18570	16088

After consumption as food and seeds about 35% of the above produces are marketable surplus which amounts as follows :-

	<u>Year 1989-90</u>	<u>Year 1988-89</u>	<u>Year 1987-88</u>	<u>Year 1986-87</u>	<u>Year 1985-86</u>
Market surplus	7201.95	6886.95	6164.90	6499.50	5630.80

Assumption: 20% of the total produces will be used as ingredients of food for birds which is the main raw materials of the proposed project.

2.4 Existing Cooperative Societies:

At present, there are 145 agricultural cooperative societies in Savar Upazila and there are about 56 other cooperative including 8 Fishermen Cooperative Societies. The Agricultural Cooperative Societies in the project area are almost dead due to lack of financial support. These group of cooperative members will be taken together to form the proposed union-based cooperative society.

2.5 Area of project:

The proposed project will cover the entire area of Tetulzora Union and initially every farmer house-hold will be a member of the society. The farm labourers will also be subsequently included in the Cooperative so that they can be provided employment opportunities for their livelihood. The project will be situated at a suitable place.

2.6 Problems faced by the farmers:

Due to absense of any processing or marketing activities the existing cooperative farmers are not getting any remunerative price of their produces. Very often they are being exploited by the local traders.

2.7 Need and justification of the project :

Through implementation of the project, the farmer members will get higher price of their produces as well as additional benefit out of the profit of the project. Moreover, the farmer members will enjoy ownership of this project with employment opportunities. On the other hand it will be supportive to the nation in respect of food production. It will also develop cooperative sense in the people and thereby promote cooperative leadership.

CHAPTER-3

3.1 Objectives:

The main objective of the project is to increase the income of the farmer members by providing remunerative price of their produces. The project will use the members' produces as raw materials and also distribute among them dividend as well as incentive price.

The other objectives of the project are as follows :-

- To provide necessary guidelines and services to the members to increase the productivity of their farms ;
- To remove the impact of unemployment ;
- To stimulate systematic cooperative activities ;
- To reduce the exploitation by the private traders ;
- To strengthen the cooperative movement.

3.2 Area of operation:

Rice, Wheat and others produces will be procured from the member-farmers of Tetulzora Union for the project and the product of the project will be marketed to the following nearby sales centre.

<u>Market segment</u>	<u>Distance from the project</u>
* Savar University	3 km
* Savar Cantonment	4 km
* Public Administrative Trading Centre (PATC)	2 km
* Savar Radio Centre	2½ km
* market	2 km
* Dhaka (Capital) City	25 km
* Manikgonj District Town	46 km
* Dhamrai Upazila Town	10 km

By-product utilization:

The main by-product of the poultry project is **faeces**.

Generally, it is used as organic fertilizer as a substitute of inorganic fertilizers like - Urea, TSP, MP and DAP which are more costly. This by-product will be distributed free of cost among the farmer-members according to their share in supply to the project.

No doubt the application of this by-product will increase the agricultural productivity and will reduce the production cost of the farmer-members.

3.3 Project components:

Basically, there is only one main product of this project. But the activities of the project may be divided into three stages like (i) Raw materials procurement from farmers (ii)

plant operation i,e, production activities and (iii) marketing.

(i) Procurement activities:

The farmer-members will individually, supply their produces at the plant level. It will be used to prepare balanced food for the birds of the project.

(ii) Plant operation:

Plant operation will include the following activities :-

- Food preparation ;
- Feeding, drinking, checking the birds ;
- Medical care ;
- Grading of birds.

(iii) Marketing:

The finished product or disposable broiler (optimum size birds) will be stored in another room for sale. The marketing section will ensure timely sale of the product.

CHAPTER-4

DETAILS OF OPERATION

4.1 The Plant Capacity:

The annual capacity of the plant is rearing of 1,20,000 birds with 6 production cycle. Production cycle covers 56-60 days. Each cycle contains 8 batches of 2500 birds each. Proper measures have been incorporated in planning the batches, production cycle and yearly capacity.

The plant capacity has been determined according to the availability of raw material.

The project envisages setting up of a poultry plant with all sorts of facilities. The total cost of the project has been estimated at Tk.1,10,95,250/-.

4.2 Marketable quantity of Product/By-product:

<u>Product/By-product</u>	<u>Production target</u>	<u>Size (in kg)</u>	<u>Mortality (rate 10%)</u>	<u>Marketable surplus</u>
Broiler	1,20,000	2 kg	12000	1,08,000
Faeces	252	MT		252

252 MT of faeces will be distributed among the farmers free of cost.

4.3 Technology and Process:

For maintaining the birds there is need of scientific instrumental arrangement for feeding, drinking etc. , which are

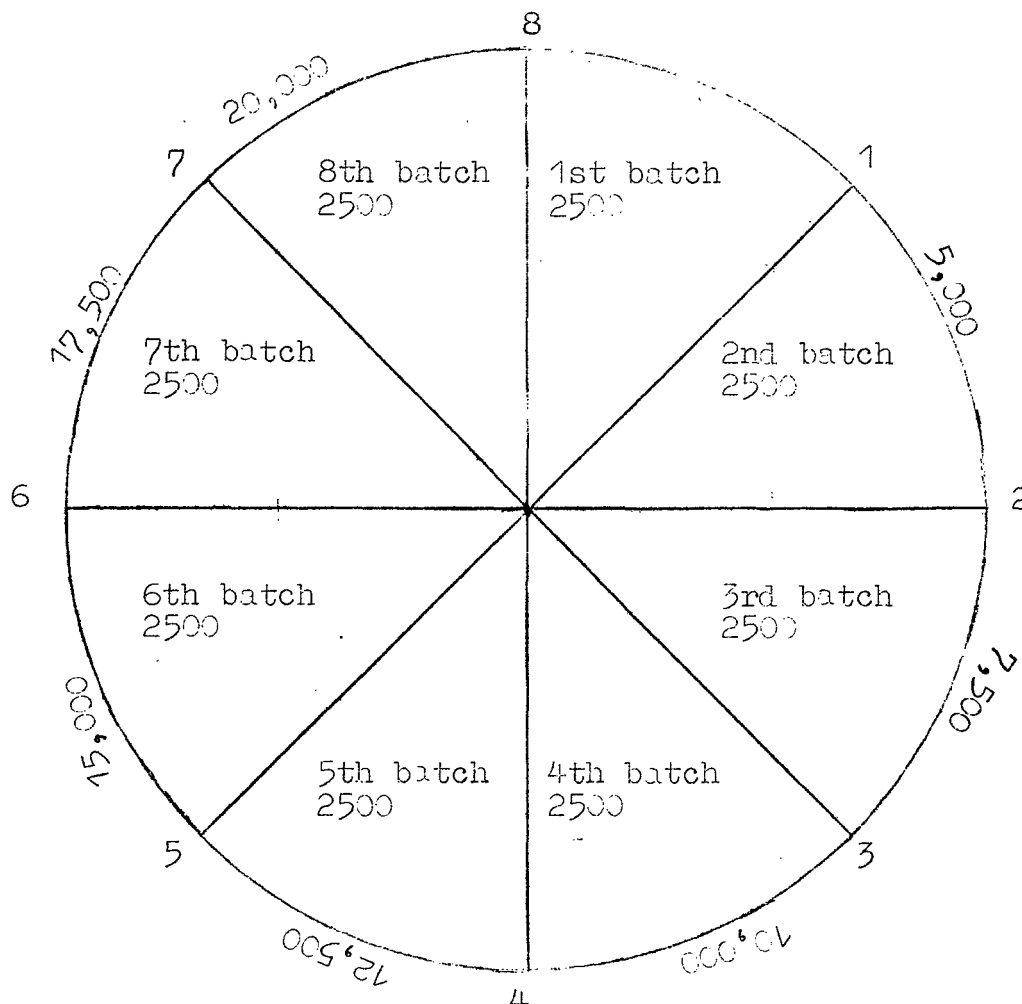
locally available. No other sophisticated or expensive technology is required. For preparing balanced food for the birds very simple machine is required which is also locally available.

The project will use improved variety of chicks (Tropic brow/ Red brow). The growth rate of the variety is very high in comparison to any other local variety.

The improved variety has the following advantages :-

- Better growth rate ;
- Shortest period of production ;
- Low mortality rate ;
- Higher rate of nutrition ;
- Optimum size in quality ;
- High market demand.

PRODUCTION CYCLE



Production period is 8 weeks or 56-60 days. The cycle contains 8 batches of birds of different ages from 1-3 to 56-60 days. Each batch holds 2500 chicks. Total capacity of each production cycle is 20,000 birds.

Expected Revenue from Sale:

<u>Production item</u>	<u>Annual net production</u>	<u>Price at project level</u>	<u>Annual revenue</u>
Broiler (Saleable optimum size birds)	1,08,000	Tk. 150.	Tk.1,62,00,000

The revenue is worked out at 100% capacity of the plant with 10% mortality rate.

Raw materials requirement:

Basic raw materials of the poultry project are foods and chicks of the birds :-

- (i) Chicks: Chicks will be purchased from Hatchery Plant which are running under both private & public ownership. Annual requirement of chicks at 100% capacity is 120,000 heads. The present rate of chicks is Tk. 17/- per head.
- (ii) Food: Balanced diet/food will be prepared for the birds at the project level. Following are the necessary ingredients of the food package.

(Food for 1-21 days birds)

Item	Required percentage	Required quantity per kg.	Price	Total price per kg.
1) Wheat	50%	.5	8	.50 x 8 = Tk. 4.00
2) Broken rice	22.5%	.22	10	.22 x 10 = " 2.25
3) Oil Cake(Til)	11%	.11	6	.11 x 6 = " 0.66
4) Fish powder	16%	.16	20	.16 x 20 = " 3.20
5) Vitamin,Minerals & premixed	.25%	.0025	50	.0025 x 50 = " 0.125
6) Salt	.25%	.0025	10	.0025 x 10 = " 0.025
	<u>100%</u>	<u>1 kg</u>		<u>Tk.10.26</u>

(Food for 21-56 days birds)

Item	Required percentage	Required quantity per kg.	Price per kg	Total price pr kg.
1) Wheat	53.5%	.535	8	.535 x 8 = Tk. 4.28
2) Broken rice	25%	.25	10	.25 x 10 = " 2.50
3) Oil Cake(Til)	11%	.11	6	.11 x 6 = " 0.66
4) Fish powder	10%	.10	20	.10 x 20 = " 2.00
5) Vitamin,Minerals & premixed	.25%	.0025	50	.0025 x 50 = " 0.125
6) Salt	.25%	.0025	10	.0025 x 10 = " 0.025
	<u>100%</u>	<u>1 kg</u>		<u>Tk. 9.59</u>

Food requirement of 1,20,000 birds at full capacity as follows :-

- Out of total 20,000 birds 37.5% is first group. Total birds of 1st group is $37.5 \times 20,000 = 7500$ birds.
- Daily requirement of 7500 birds is 7500×20 (20 gram per bird) = 0.15 MT
- Monthly requirement = 4.50 MT
- Yearly requirement = 54.00 MT
- Cost of 54 MT is $54 \times 1000 \times 10.26 = \text{Tk.}554,040/-$
- Daily food requirement of 12,500 birds of second group is (100 grams per day per birds) = 1.25 MT
- Monthly requirement is $1.25 \times 30 = 37.50$ MT
- Yearly requirement = 450 MT
- Cost of 450 MT @9.59/kg = $450 \times 1000 \times 9.59 = \text{Tk.}43,15,500/-$

Total cost of raw materials is given below :-

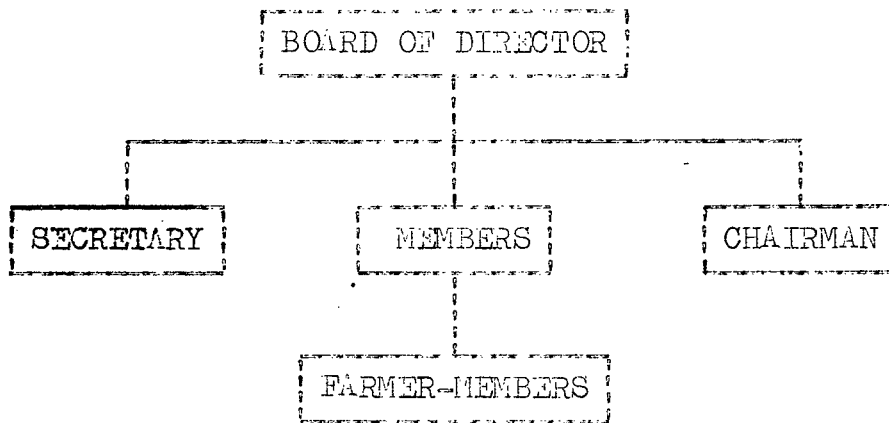
<u>Item</u>	<u>Yearly requirement</u>	<u>Unit price</u>	<u>Total cost</u>
Chicks	1,20,000 birds	Tk. 17.00	Tk.20,40,000/-
Ingradient of food	i) 54 MT	Tk.10,260.00	Tk. 5,54,040/-
	ii) 450 MT	Tk. 9,390.00	Tk.43,15,500/-
Annual total cost of raw material			<u>Tk.69,09,540/-</u> =====

CHAPTER-5
ORGANISATION & MANAGEMENT

5.1 Corporate form of Board of Directors:

The total members of the Board of Directors will be 9(nine) and among them one will be the Chairman and one will be the Secretary as per Cooperative Ordinance of 1984 and Rules of 1987. The Board of Directors will be elected for two years. The Board will manage the Cooperative Society as well as project as per bye-laws of the society.

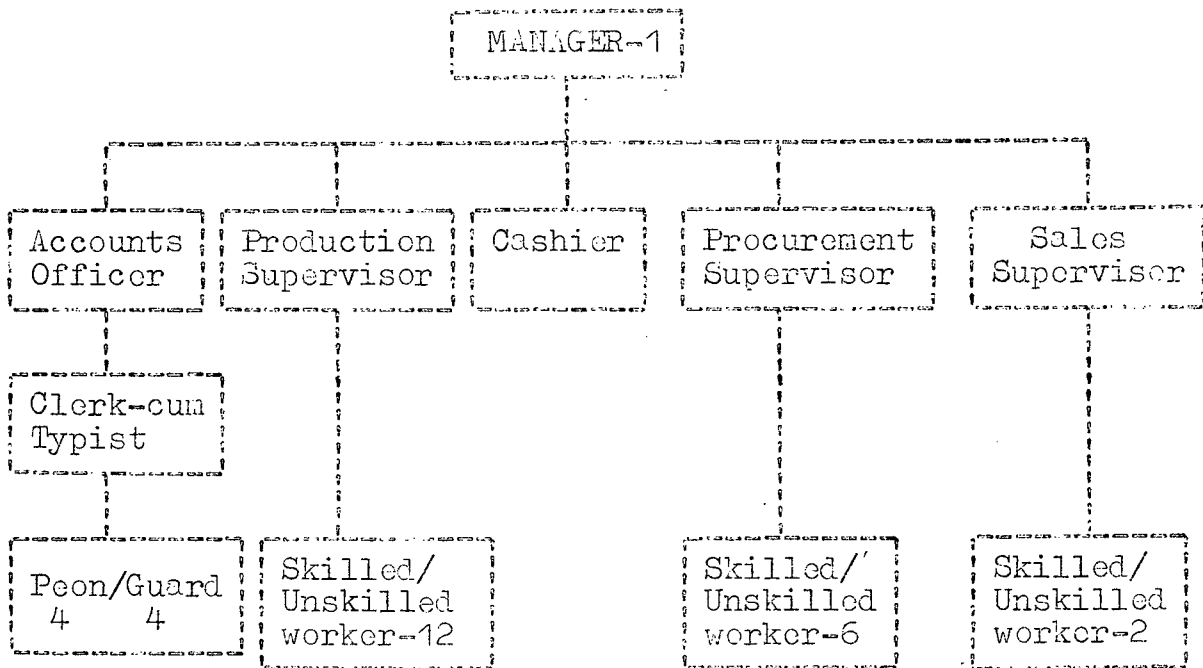
Organisational chart is given below



The Secretary will propose annual programme with budget to the Board which will take approval from Annual General Meeting(AGM). The over all management of the project will be vested on the Manager. The Board of Directors will formulate policies and provide guidelines for its business operation. The Manager will be the Chief Executive who will manage the day to day operations of the project. He will be assisted by the staff.

5.2 Operational Management:

The operation of the project will be managed by the following staff under the guidance of the Board of Directors.



(a)	Manager	=	1
(b)	Accounts Officer	=	1
(c)	Production Supervisor	=	2
(d)	Cashier	=	1
(e)	Procurement Supervisor	=	1
(f)	Sales Supervisor	=	4
(g)	Clerk-cum-Typist	=	1
(h)	Peon	=	4
(i)	Guard	=	4
(j)	Skilled/Unskilled Worker (12 + 6 + 2)	=	20
	Total:		<u>41</u>
			====

Details of operational management:

Category-A

<u>Managerial/ Administration</u>	<u>Qualifications</u>	<u>Monthly salary</u>	<u>Required Number</u>
1. Manager	B.Sc(Hons) A.H. Experience -- 5 yrs	10,000/-	1
2. Accounts Officer	M.Com Experience -- 5 yrs	8,000/-	1
3. Production Supervisor	B.Com Experience -- 2 yrs	6,000/-	2
4. Procurement Supervisor	B.Sc (Hons) A.H. Experience -- 2 yrs	6,000/-	1
5. Sales Supversisor	B. Com Experience -- 2 yrs	6,000/-	4
6. Cashier	B.A./B.Com Experience -- 3 yrs	5,000/-	1
7. Clerk-cum-Typist	H.S.C. with typing Experience -- 2 yrs	3,000/-	3
8. Peon	Class-VIII	2,500/-	4
9. Guard	Class-VIII	2,500/-	4

Total: 21

Category-B

1. Labour	Tk.75/- (Daily wages per 8(eight) hour).	20
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(A + B) Total : 41

CHAPTER-6

INVESTMENT

6.1 Details of project cost components:

Land:

The price of land measuring .50 acres including development cost has been estimated Tk.4,50,000/- as per present market value. The location is considered suitable and the area of land is adequate to implement the proposed project.

Building/Construction activities:

The construction will include birds house, godowns, office, store-room, labour/guard shed etc. The birds shed would be 150' x 50' = 7500 sft. and number of sheds will be 3 (three). The food godown with food preparation mill house will be 50' x 30' = 1500 sft and the office store, guard/labour room will be 40' x 36' = 1440 sft. The cost of the construction including electrification, water line and sanitations has been estimated at Tk. 60,74,000/- with 10% contingency. Details of the construction with specification has been shown in Annexure-1.

Machinery & Equipment:

- The estimated total cost of food manufacturing machine with 2 MT capacity per day is Tk. 50,000/-. The machine is locally available.
- The estimated cost of required numbers of brooder, feeder, drinker etc. is Taka 1,00,000/- and these are locally available.

- The estimated cost of 2 Air Cooler Machine with instalation charge is Taka 1,50,000/- which is also locally available. Details of Machinery & Equipment is shown in Annexure-2.
- The cost of instalation of watertank, electric substation, sanitation etc. has been included in construction cost. Construction schedule is shown in Annexure-3.

Furniture & Fixture:

- The cost of furniture & fixture and office equipment has been estimated at Taka 1,50,000/-.

Repairs & Maintenance:

- The cost of repairs & maintenance has been estimated at Taka 30,000/- per month.

6.2 Working Capital Requirement:

Cash @Tk.2.5% of sales revenue - 4,05,000/-

Inventories

- (a) Stock of ingredients of food for 6 months
252 MT ((i) 27x10260 (ii) 225x9590) - 24,34,750/-
- (b) Chicks 20,000 heads @Tk.17/- - 3,40,000/-
- (c) Stock of finished product for 7 days
(2437.5 x 150) - 3,37,500/-
- (d) Salary (one month) - 94,000/-
- (e) Wages (one month) - 45,000/-
- (f) Power & Water - 70,000/-
- (g) Spares & Stores - 20,000/-

Tk.37,46,250/-
=====

6.3 Initial Investment:

Total project cost (in taka):

1.	Land	=	4,50,000/-
2.	Civil construction (including 10% contingency)	=	60,74,000/-
3.	Plant & Machinery	=	3,00,000/-
4.	Furniture & Fixture	=	1,50,000/-
5.	Power connection	=	50,000/-
6.	Water(STW) + Power Pump	=	80,000/-
7.	Pre-investment expenses	=	20,000/-
	Total initial fixed investment	=Tk.	71,24,000/- =====
	Working Capital Margin	=Tk.	37,46,250/- =====
1.	Total initial investment required	=Tk.	1,08,70,250/-
2.	Interest during construction phase	=Tk.	2,25,000/-
	Total cost of the project	=Tk.	1,10,95,250/- =====

6.4 Financial Plan:

The cooperative society will raise share capital to the tune of Tk. 22,19,000/- to support 20% equity money to the project. As per financing plan Tk.88,76,250/- will be arranged as long term/ short term loan from the financing banks.

(a) Equity contribution by the cooperative (20%) = 22,19,000/-

(b) Term loan from the financing banks (80%) = 88,76,250/-

Tk. 1,10,95,250/-

Divident policy:

The cooperative society will distribute 25% divident on share capital. Out of net income after divident 50% profit will be distributed among the members as incentive prize according to their share in supply to the project and the rest 50% will be retained in the project account.

Capacity utilization:

It is estimated that the project will start at 100% capacity after two months of operation and the production will start during 8 weeks of operation.

Repayment of loan and interest:

Interest is calculated @ Tk.14% and 16% on long-term and short-term loans respectively. The loan is proposed to be repaid in 9 equal annual instalments starting from the 2nd year of operation. A schedule showing repayment of loan & payment of interest is shown in Annexure-4.

6.5 Feasibility:

The expected financial profitability of the project is as follows :-

1. A.R.R.:

The average rate of return is 64%.

2. Break-Even Point:

(a) Capacity - 47%

(b) Quantity sales - 56,537

(c) Revenue - Tk. 84,80,550

Details of calculation is shown in Annexure-10.

3. Net present value:

The Net Present Value at 16% interest of discount factor is 1,29,97,800/-. Details of Calculation is shown in Annexure-11.

4. I.R.R.

The Internal Rate of Return of the project is 40.31%. Annexure-11.

5. Sensitivity:

At 5% lower revenue IRR is 33.63% and at 5% higher price of raw materials IRR is 39%. Details of calculation is shown in Annexure-12 & 13.

6. Benefit Cost Ratio:

At 16% interest or discount rate benefit cost ratio is 2.17. Details of calculation is shown in Annexure-14.

7. Debt-Service Coverage Ratio: (Annexure-15).

The above financial results/indicators prove that the project is financially feasible, investable and bankable.

CHAPTER - 7

RECOMMENDATIONS

The proposed project is found technically feasible, financially rewarding, economically viable and in terms of its objectives it has immense socio-economic impacts.

The project, on implementation, will ensure the following benefits to the members and the society :-

- (a) Incentive price of produces by way of supply as raw materials to the project.
- (b) By-product of the project will be supportive to farm productivity.
- (c) Creation of employment facilities for 40-50 persons.
- (d) Additional annual income of each member will increase to the extent of Tk.1,000/- over their present net income by Tk. 5,000/-.
- (e) Backward, forward & horizontal linkages will be established towards development strategy.

Therefore, the project may be implemented.

ANNEXURE-1

DETAILS OF BUILDINGS & CONSTRUCTION

Sl. No.	Item	Specification	Size area	Cost sft	Estimated total cost
1.	Office, Store, Guard Room & Labour Room.	5" brick wall, brick pillar, r.c.c.column, CI Sheet Roof over iron, truss, brick soiling floor 10' height.	40'x36' = 1440 sft	200/-	2,88,000/-
2.	Godown/Milling House	5" brick wall, brick pillar, r.c.c.column, C.I. Sheet roof over iron truss brick soiling floor 10' height.	50'x30' = 1500 sft	200/-	3,00,000/-
3.	Bird House	5" brick wall, brick pillar, r.c.c.column, C.I. Sheet roof over iron truss, brick soiling floor 10' height.	150'x50'x3 =22500 sft	200/-	45,00,000/-
4.	Water Tank	One 5000 gallons capacity overhead water tank of r.c.c.c.uster. One 8000 gallons capacity under ground reservoir made of 15" wall with cement plastering.	5000 gln. 8000 gln.	Lum-sum	1,25,000/-
5.	Electric Sub-Station Room	10" brick wall r.c.c. lintal roof, c.c.floor height 12'	12'x10' =120sft	200/-	24,000/-
6.	Boundary Wall	5" brick wall with 10"x10" pillar and 7' height.	1000 sft	125/-	1,25,000/-
7.	Toilet		(Lum-sum)		10,000/-
8.	Electrification & Sanitation		(Lum-sum)		1,00,000/-
9.	Other renovation		(Lum-sum)		50,000/-
10.	10% contigency				5,52,000/-
					Tk. 60,74,000/- =====

ANNEXURE-2

LIST OF MACHINERY & EQUIPMENT

Sl. No.	Name of Machine/ Equipment	No. of unit required	Unit Price	Total Cost
1.	Food Preparation Machine (Local)	1	50,000/-	50,000/-
2.	Brooder, Feeder, Drinker, Guarder (Local)	(Lum-sum)		1,00,000/-
3.	Air Cooler (Local)	2	75,000/-	1,50,000/-
				<u>3,00,000/-</u>

ANNEXURE-3

CONSTRUCTION PERIOD

1.	Land acquisition	--	1 month
2.	Site development	--	1 month
3.	Construction Building & others	--	3 months
4.	Installation of Machinery	--	1 month
5.	Electrification & Sanitation	--	1 month
6.	Trial & Commissioning	--	1 month
			<u>8 months</u>

ANNEXURE-5

Depreciation:

<u>Assets</u>	<u>Value</u>	<u>Rate/%</u>	<u>Depreciation/Tk</u>
Building	60,74,000	5%	3,03,700/-
Machinery	3,00,000	10%	30,000/-
Logistics	3,00,000	10%	30,000/-
	<u>66,74,000</u>		<u>Tk.3,63,700/-</u>

Salvage value:

Working Capital (100%)	--	Tk.37,46,250/-
Land (100%)	--	" 4,50,000/-
Building (16%)	--	" 9,74,880/-
		<u>Tk.51,71,130/-</u>

Working Capital Margin:

Cash 2.5% of sales revenue	--	Tk. 4,50,000/-
----------------------------	----	----------------

Inventories:

(a) Stock of raw materials i) 27 MTx10260 for 100d for 180 days ii) 225MTx9590	--	Tk.24,34,750/-
(b) Chicks 20,000 heads @Tk.17/-	--	Tk. 3,40,000/-
(c) Stock of finished goods for 7 days	--	Tk. 3,37,500/-
Salary (one month)	--	Tk. 94,000/-
Wages (one month)	--	Tk. 45,000/-
Power and Water (one month)	--	Tk. 70,000/-
Spares & Stores (one month)	--	Tk. 20,000/-
		<u>Tk.37,46,250/-</u>

COST OF SALES

ANNEXURE-6

Particulars	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
Raw materials	6333745	6909540	6909540	6909540	6909540	6909540	6909540	6909540	6909540	6909540
Wages	540000	540000	540000	540000	540000	540000	540000	540000	540000	540000
Salaries	1128000	1128000	1128000	1128000	1128000	1128000	1128000	1128000	1128000	1128000
Stores & Spares	2400000	2400000	2400000	2400000	2400000	2400000	2400000	2400000	2400000	2400000
Power, Fuel & Water	7700000	8400000	8400000	8400000	8400000	8400000	8400000	8400000	8400000	8400000
<u>Selling Exp:</u>										
Sales commission (2.5%)	365635	438750	438750	438750	438750	438750	438750	438750	438750	438750
Advertisement (2.5%)	365625	438750	438750	438750	438750	438750	438750	438750	438750	438750
Repair and Maintenance	330000	360000	360000	360000	360000	360000	360000	360000	360000	360000
Administrative overhead	1100000	1200000	1200000	1200000	1200000	1200000	1200000	1200000	1200000	1200000
Interest	1317600	1317600	1237800	1158000	1078200	998400	918600	838800	759000	679200
Depreciation	363700	363700	363700	363700	363700	363700	363700	363700	363700	363700
Miscellaneous	55000	60000	60000	60000	60000	60000	60000	60000	60000	60000
Total cost:	11919295	12756340	12676540	12596740	12516940	12437140	12357340	12277540	12197740	12117940

NET INCOME STATEMENT

Particulars	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
Sales revenue	13500000	16200000	16200000	16200000	16200000	16200000	16200000	16200000	16200000	16200000
Cost of sales	11919295	12756350	12676550	12595750	12516950	12437150	12357350	12277550	12197750	12117950
Estimated project	1580705	3443650	3523450	3603250	3683050	3762850	3842650	39922450	4002250	4082050

Taxation: The project is entitled to tax holiday for 10 years, therefore, implication of taxation is not taken into account for the purpose of budget calculations.

CASH FLOW STATEMENT

Particulars	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
Sales proceeds	13500000	16200000	16200000	16200000	16200000	16200000	16200000	16200000	16200000	16200000
Loss: Cost of goods sold.	6873745	7449540	7449540	7449540	7449540	7449540	7449540	7449540	7449540	7449540
Gross profit	6626255	8750460	8750460	8750460	8750460	8750460	8750460	8750460	8750460	8750460
Less: administrative & selling exp.	3364250	3625500	3625550	3625500	3625500	3625500	3625500	3625500	3625500	3625500
Operating profit (EBIT)	3262005	5124960	5124960	5124960	5124960	5124960	5124960	5124960	5124960	5124960
Less: Intt.	1317600	1317600	1237800	1158000	1078200	998400	918600	838800	759000	679200
Loss: Depreciation.	1944405	3807360	3887160	3966960	4046760	4126560	4206360	4286160	4365960	4445760
Net profit before tax	363700	363700	363700	363700	363700	363700	363700	363700	363700	363700
Net profit	1580705	3443660	3523460	3603260	3683060	3762860	3842660	3922460	4002260	4082060

Ratio %

(a)	Gross profit to sales	- 49%
(b)	Operative profit margin	- 24%
(c)	Net profit to sales	- 11.70%
(d)	Return on equity	- 71.23%
(e)	Return on assets	- 14.24%

ANNEXURE-9

LIQUIDITY AND APPROPRIATION

Particulars	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
Profit	1580705	3443650	3523450	3603250	3683050	3762850	3842650	3922450	4002250	4082050
Depreciation	363700	363700	363700	363700	363700	363700	363700	363700	363700	363700
Annual available liquidity	1944405	3807360	3887160	3966960	4046760	4126560	4206360	4286160	4365960	4445760
Loan instalment	-	570000	570000	570000	570000	570000	570000	570000	570000	570000
Dividend proposed @ 25%	-	556000	556000	556000	556000	556000	556000	556000	556000	556000
Incentive proposed @ 50%	-	1112000	1112000	1112000	1112000	1112000	1112000	1112000	1112000	1112000
Annual balance	1944405	1569360	1649160	1728960	1808760	1888560	1968360	2048160	2127960	2207760
Accumulated balance	1944405	3513765	5162925	6891885	8700645	10589205	12557565	14605725	16733685	18941445

Break-Even Analysis:

The break-even Analysis is shown below :-

Break-Even Analysis (100%):

Revenue/Tk = 1,62,00,000

Variable Cost/Tk:

Raw materials	-	69,09,550	
Wages	-	5,40,000	
Stores & Spares	-	2,40,000	
Power, Fuel etc	-	8,40,000	
Commission on sale @2.5%	-	4,38,750	
		<u> </u>	= 89,68,300

Fixed Cost/Tk:

Salaries	-	11,28,000	
Administrative overhead	-	1,20,000	
Sales expenses(fixed @2.5%)	-	4,38,700	
Repairs & Maintenance	-	3,60,000	
Interest	-	13,17,600	
Depreciation	-	3,63,700	
Miscellaneous	-	60,000	
		<u> </u>	= 37,88,000

∴ Break even sales = $\frac{\text{Fixed cost}}{\text{Price-Variable cost}}$

= $\frac{37,88,000}{150 - 83} = \frac{37,88,000}{67} = 56537$

∴ Break even capacity = 47%

ANNEXURE-11

CALCULATION OF I.R.R.

Years	Net Cash Flow	NPV at 16% interest	NPV at 40 interest	NPV at 42% interest
0	- 1,10,95,250	- 1,10,95,250	- 1,10,95,250	- 1,10,95,250
1	32,62,005	28,12,073	23,29,724	22,97,104
2	51,24,960			
3	51,24,960			
4	51,24,960	1,91,88,362	85,30,496	80,70,787
5 - 9	51,24,960			
10 (including salvage value	92,34,940	20,92,637	3,18,605	2,76,125
		-----	-----	-----
		1,29,97,800	83,575	(-)4,51,234
		=====	=====	=====

$$\begin{aligned}
 \text{IRR} &= 40 + \frac{83,575}{83,575 - (-4,51,234)} \times (42 - 40) \\
 &= 40 + \frac{83,575 \times 2}{5,34,809} \\
 &= 40 + \frac{1,67,150}{5,34,809} \\
 &= 40 + .31 \\
 &= 40.31\%
 \end{aligned}$$

ANNEXURE-12

Calculation of IRR at 5% lower price

Sensitivity Analysis

Years	Net Cash Flow	NPV at 16% interest	NPV @ .30%	NPV @ .35%
0	- 1,10,95,250	- 1,10,95,250	- 1,10,95,250	- 1,10,95,250
1	25,87,005	22,29,998	19,89,924	19,16,194
2	43,14,960	1,61,55,641	97,05,630	83,02,415
3 - 9	43,14,960	-	-	-
10	84,24,940	19,09,091	6,11,128	4,18,720
		<u>91,99,480</u>	<u>12,11,440</u>	<u>(-) 4,57,920</u>

$$\begin{aligned}
 \text{IRR} &= 30 + \frac{12,11,440}{12,11,440 - (-4,57,920)} (35 - 30) \\
 &= 30 + \frac{12,11,440 \times 5}{16,69,360} \\
 &= 30 + \frac{60,57,200}{16,69,360} \\
 &= 30 + 3.63 \\
 &= 33.63\%
 \end{aligned}$$

ANNEXURE - 13

Calculation if IRR at 5% higher price of raw materials

Year	Net Cash Flow	NPV at 30%	NPV at 40%
0	- 1,10,95,250	- 1,10,95,250	- 1,10,95,250
1	29,45,318	22,65,539	21,03,546
2	47,79,483	1,07,50,491	79,55,449
3 - 9	---	---	---
10	88,89,463	6,44,486	3,06,686
		25,63,266	(-) 729569

$$\begin{aligned}
 \text{IRR} &= 30 + \frac{25,63,266}{25,63,266 + 7,29,569} (40-30) \\
 &= 30 + \frac{25,63,266 \times 10}{28,22,835} \\
 &= 30 + 9.08 \\
 \therefore \text{IRR} &= 39\%
 \end{aligned}$$

ANNEXURE - 14

Benefit Cost Ratio

Year	Investment cost	Net benefit	Discounted benefit @16%	Discounted cost @16%
0	- 1,10,95,250	---	---	-1,10,95,250
1	---	32,62,000	28,12,000	---
2 - 9	---	51,24,960	1,91,88,300	---
10		92,34,940	20,92,600	
			2,40,92,900	1,10,95,250

$$\begin{aligned}
 &= \frac{2,40,92,900}{1,10,95,250} \\
 \therefore \text{B/C Ratio} &= 2.17
 \end{aligned}$$

Calculation of Debt-Service Coverage Ratio:

Particulars	1st yr	2nd yr	3rd yr	4th yr	5th yr	6th yr	7th yr	8th yr	9th yr	10th yr
Profit	1580705	3443650	3523450	3603250	3683050	3762850	3842650	3922450	4002250	4082050
Add: Interest	1317600	1317600	1237800	1158000	1078200	998400	918600	838800	759000	679200
Depreciation	363700	363700	363700	363700	363700	363700	363700	363700	363700	363700
Total	3262005	5124950	5124950	5124950	5124950	5124950	5124950	5124950	5124950	5124950
Instalment to be paid	570000	570000	570000	570000	570000	570000	570000	570000	570000	570000
Add: Interest	1317600	1317600	1237800	1158000	1078200	998400	918600	838800	759000	679200
Total	1317600	1887600	1807800	1728000	1648200	1568400	1488600	1408800	1329000	1249200
Debt - Service Coverage Ratio	2.48	2.72	2.83	2.97	3.11	3.27	3.44	3.64	3.86	4.10

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ACKNOWLEDGEMENTS

The 5th ICA / Japan Training Course on Strengthening the Management of Agricultural Cooperatives in Asia provided a very good opportunity for me to better understand the integrated cooperatives and cooperative management techniques. It also exposed me many important methods on how to serve cooperative farmer members as well as how to increase their income.

The Poultry Feed Processing Project was prepared under the guidance of this course.

For giving me this valuable opportunity, I would like to express my heartfelt gratitude to the cooperators in ICA ROAP, and Japanese sponsors and especially to the project director, Mr. M. V. Madane who not only gave us much useful knowledge and guidance but also provided all possible conveniences for us during our course.

I am very grateful for all knowledgeable and experienced professors in IIM, India who have

kindly given us many important lectures.

I am the same grateful to the leaders and my fellow colleagues in my organization -- All China Federation of Supply and Marketing Cooperatives for sending me to this course and shouldering my responsibilities while I am away on this course.

I would like to convey my deep thanks to Mr. Xu Zhaoqing, Deputy Chairman of Sanhe County Union of Supply and Marketing Cooperatives and other concerned cooperative friends in Sanhe County for all the necessary informations and other help they gave to me.

Rong Jun

Jan. 1990

1. SUMMARY

This project deals with a chicken feed processing plant to be set up by Sanhe County Union of Supply and Marketing Cooperatives in Hebei Province.

1.1 The title of the project is Sanhe Cooperative Chicken Feed Plant.

1.2 The life of the plant is assumed to be 14 years and the construction of the plant will take 7 months.

1.3 Main raw materials to be processed in the plant are corn, bran and bean meal.

1.4 Main operation of the plant is to produce granulated chicken feed.

1.5 Capacity

Capacity/Hour	5 MT
Daily Capacity	60 MT
Annum Capacity	15,000 MT

Note: a) Working hours in a day: 12 Hours

b) Processing days in a year: 250 Days

1.6 Production

	(in metric tons)		
Year	1991	1992	1993 onwards
Raw Material	2,800	5,600	8,400
Product	5,000	10,000	15,000

1.7 Investment

	(Yuan)
Land and Civil Works:	1,500,000
Machinery and Equipment:	2,250,000
Others	250,000

Note: Machinery and equipment expenses include installation and fixing cost.

1.8 Fund Resources

Among the 4 million yuan investment, 3.5 million will be long term loan from bank and 500,000 will be the self reserve fund of the Sanhe County Union of Supply and Marketing Cooperatives.

The interest of the bank loan is 10.8 %.

1.9 The objectives of the project are as follows:

1.9.1 to solve corn producers' marketing problem and increase their income through processing their corn into chicken feed,

1.9.2 to reduce poultry farmers' production cost and minimize their risk by securing the supply of chicken feed to them at a lower price, and

1.9.3 to complete the cooperative poultry production service system of Sanhe County.

2. Result of the Financial Analysis:

Pay back period:	5 years
Break even point:	8,950.5 MT
Net present value at 10.8%:	3,513,599 MT
Internal return ratio:	23.4 %
Benefit and cost ratio:	1.88
Total profit during the plant life:	6,623,500 Yuan

2. BACKGROUND

2.1 Overall Situation:

Sanhe County of Hebei Province is located on Hebei plain 56 KMs to the east of Beijing and 120 KMs to the northwest of Tianjin. Of its 360,000 inhabitants, 330,000 or over 90 % people live on agricultural and sideline production and most of them are members of the Sanhe County Union of Supply and Marketing Cooperatives. Encouraged by the state government and promoted by Hebei Provincial Federation of Supply and Marketing Cooperatives and the All China Federation of Supply and Marketing Cooperatives, the Sanhe cooperative societies headed by the county union, have developed a very sound poultry production service system. This system is mainly characterized with 2-insures and 4-at-doors. Two-insures refers that the survival rate and the remunerative selling price are insured for members and 4-at-doors means the 4 services are provided at farmer members' doors, namely, chick distribution, feed supply, veterinary service and ready chicken purchasement. This system not only created higher income for the local farmers but also earned the cooperative in

Sanhe a good fame almost all over the whole nation. At present, 1 million poultry from 10 cooperative farms and 2 million chicken from 865 specialized chicken farmer households in the county are provided to the nearby urban markets in Beijing, Tianjin and other places each year making an annual turnover of 40 million yuan for the cooperatives and their members.

In order to improve the services to farmers, the Sanhe cooperatives has established many important service facilities, such as artificial incubation farm, mobile veterinary service centre, chicken collecting centre and slaughtary and cold storages. Cooperative services are available in all the production procedures right from incubation to the marketing, all at the farmers' doors. However, the cooperative service system there is found not complete and perfect after detailed and careful consideration and study there is no chicken feed processing facility in the cooperatives.

It is well aware among poultry farmers that in poultry production, the most vital factor to decide the profitability and efficiency is the

feed input. The cost of feed input usually takes up more than 70 - 75 per cent of the total poultry production cost. Any slight changes in feed price might result in completely different situation in this business. Currently, all the chicken feed provided by Sanhe cooperatives is purchased at a price of around 1,400 yuan/ton from a nearby Sino-Thai joint venture --Chia Tai. This means the fortune of the Sanhe poultry production depends somewhat upon the feed supplier, hence a great risk to the cooperative business there. Serious and careful studies and analysis were carried out and arrived at the conclusion that the feed problem must be solved locally and promptly. Right away, several surveys were implemented to realize that not only a must but also a great feasibility is there for the cooperatives in Sanhe county to establish their own chicken feed processing plant.

2.2 Area of the Project

2.1 The projected chicken feed processing plant will provide granulated chicken feed for all individual member households specialized in

poultry farming and the 10 cooperative poultry farms in the whole county.

2.2.2 It will purchase fodder grain (corn) from members all over the county.

2.2.3 The location of the factory is in the northwest of the county, 10 KMs from the county center and enjoys very convenient rail and highway transportation conditions and very rich underground water resources. It is very close to a coal mine and the power supply is highly guaranteed.

2.2.4 The factory will cover an area of 12,000 square meters.

2.3 Problems Faced by the Farmers

2.3.1 The agricultural production in Sanhe county has been developing very fast in recent years. There are 38,933 hectares of farm land in the whole county, and the annual output of grain products totals 200,000 MT. The main grain products are wheat and corn, both having one crop a year. Wheat is the main food of the local people and

there is no problem for marketing while things are totally different for corn, because corn produced here is only required for feed production and farmers used to sell it to feed factories in other places. The price was not guaranteed as a result of changes in corn production in nearby regions. To make things worse, farmers had to pay quite a lot for the long distance transportation and now and then, they even can not sell their products at remunerative prices.

2.3.2 Sanhe county's poultry industry developed under the guidance of the cooperatives requires more and more granulated feed. It can be shown in the following chart.

Year	Chicken No.	Feed per Head	Total Requirement
1988	1,040,000	4 kg	4,160 MT
1989	1,600,000	4 kg	6,400 MT
1990	2,000,000	4 kg	8,000 MT
1991	2,500,000	4 kg	10,000 MT
1992	3,500,000	4 kg	14,000 MT

The major raw material for granulated feed is

corn, which takes up 56 % of all the raw materials. Supplementary materials include: bran, bean meal, bone powder, various trace elements and etc. Thus, had a chicken feed processing plant built up by the Sanhe cooperatives, both the marketing problem bothering the corn producers and the feed problem troubling poultry farmers would be solved easily and simultaneously, let alone the fact that many corn producers are also poultry farmers.

2.4 Need and Justification for the project

2.4.1 The cooperative chicken feed plant will satisfy corn producers' need for marketing their products at a remunerative price and secure a proper return to their production by purchasing and processing their corn.

2.4.2 The project will also help to meet the need of poultry farmers through providing them granulated chicken feed at lower prices on a guaranteed basis so as to reduce their production cost and increase their income.

2.4.3 The project is necessary for completing the

cooperative poultry production service system in the county.

2.4.4 This project is needed to strengthen the Sanhe cooperatives, to make them more self-reliant, furthermore, to lead them to the position to provide more support to the cooperative development in the whole country.

2.4.5 The justifications of this project are as follows:

- a) The raw materials for the factory are mostly locally available and more materials can be obtained either by increasing the local production or by channelling in from nearby resources if necessary. Since almost all the raw material producers are cooperative members and they are very much satisfied with the services provided by their respective societies, the raw material can be guaranteed without any problems.
- b) The whole products of the projected factory will be taken by the local cooperative farms or specialized poultry farmers in the county and there is no marketing problem for the factory.

Moreover, this granulated chicken feed is a substitute product for imported one, it is predicted to be able to sell well even in the outside open market.

- c) The technology of processing granulated poultry feed is available in other cooperative societies which can be introduced to Sanhe county under the help and coordination of All China Federation of Supply and Marketing cooperatives.
- d) The investment will be partly self reserves and partly loans channelled in through All China Federation of Supply and Marketing Cooperatives.
- e) The Government strongly support the development of agricultural and sideline production including the production of both corn and poultry, and it very much encourage the rural industrialization for improving people's living standard. Therefore, the project enjoys a very favourable condition for its development.

3. GRANULATED CHICKEN FEED PLANT PROJECT

3.1 Objectives

The sole objectives of this project are to increase corn farmer member's income through processing their product--corn and to reduce the poultry farmer member's cost in their production by supplying them chicken feed at lower prices, meanwhile to increase the cooperative reserves for improving its services to farmers in the future. The objectives of the project can be described as follows:

- 3.1.1 To market corn producers' product at a guaranteed remunerative price,
- 3.1.2 To achieve value addition to corn for the members through processing ,
- 3.1.3 To rid the poultry farmers of the risk of insufficient supply of feed or price hikes in feed provided from outside,
- 3.1.4 To reduce poultry farmers cost by providing them

the granulated feed at lower prices.

3.1.5 To complete the whole service system in poultry production -- the main cooperative business in the county and promote the whole poultry industry there,

3.1.6 To make the cooperative financially stronger and enable them to extend more and better service in the future both to their own members and to other cooperatives, and

3.1.7 To contribute to the development of the cooperatives in the whole nation by providing more financial support as well as a good model.

3.2 Area of the Project Operation

The projected plant will cover an area of 12,000 square meters. It will purchase corn and other locally produced raw materials from all the farmer members in the whole county through primary cooperative societies and the granulated chicken feed produced from the factory will be sold to the specialized poultry farmer members and the cooperative poultry farms in the county.

In this way, the services provided from this factory will cover almost all farmer members in the county directly or indirectly.

3.3 Project Components Include this followings:

3.3.1 Construction of the Plant and Installation of Machineries and Equipments.

- a) This procedure will take about 5 months, starting from mid-March to the end of July.

- b) The plant will be built on the site of an original small cooperative feed factory. The land occupation will be expended a little. Most of the equipments and machineries will be purchased domestically.

3.3.2 Procurement of the Raw Materials:

Most of the raw materials will be purchased from the local producers and in case of any unexpected changes in local supplying situation, raw material can also be purchased from Jilin province the largest producing area in China which is very near to Sanhe county and rail and

high way transportations are both very convenient.

Apart from local consumption and the portion to be handed over to the State, the marketable surplus of corn in the county is estimated to be more or less than 90,000 metric tons each year. A cooperative bean oil factory located in the county produces 4,000 metric tons bean meal every year which can all be provided to the chicken feed plant. So, the raw material for the feed plant should have no problems. The local cooperative societies also have close relations with many feed trace element and supplementary material producers and suppliers, so the requirement for other materials can also be met without any trouble.

3.3.3 Processing of the Granulated Chicken Feed

- a) The processing of the granulated feed will generally follow the procedures listed below:

Raw Material Accepting -- Cleaning -- Crushing --
Dispensing -- Mixing -- Granulating -- Packaging.

- b) The plant will apply computer control technology. Almost all production procedures from the raw material accepting, to processing and to packaging will be controlled with computer and observed from meters at a quite high mechanical and automatic level. It is intended to build this plant into one of the most advanced of the similar factories in our country.
- c) All workers will be trained in other similar factories to master the technique and skills they need in the production.

3.3.4 Products Marketing

- a) Most of the products will be supplied to specialized poultry farmer members and the 10 cooperative farms. The feed required by individual members will be sent to their doors by their respective primary cooperative societies and the feed needed by the cooperative farms will taken away on their own.
- b) The products will also be sold to the local non-member poultry farmers at a price higher than that for members by lower than the market.

c) Whatever left behind will be sold to the nearby markets or neighbouring counties.

d) The capacity of the factory is designed in accordance to the need of the poultry production situation in the county and there should not be any problems in marketing the products.

3.3.5 Extension of the Project

a) The project will largely solve the marketing problem for corn producers and reduce the cost of poultry production and makes these two production more profitable which in turn will attract more surplus labours in the countryside to these two productions and join cooperatives. As a result the participation of members will increase.

b) Along with development of feed production, other related services will also be improved such as corn bartering for feed, feed nutrition guidance for farmers and standardization of poultry products.

c) Better and systematic services will also improve

members' commitment to cooperatives and to increase their participation in cooperative affairs.

d) Income earned from this course will also enable the cooperatives to extend other services to members in addition to more return to members.

4. DETAILS OF OPERATION.

4.1 Location of the Plant

The plant will be located on the site of an original small feed processing factory in the northwest of Sanhe county, 10 kms to the county centre. It will cover an area of 12,000 square metres. Close to the Xiaowufu Coal Mine, there will be no problem for the supply of power and fuel. The underground water there proves to be very rich and clean. And the rail and highway transportations are both very convenient. Almost all the raw material suppliers and poultry farms both collectively owned by the cooperatives and separately run by individual members are easily reached by highway.

4.2 Capital Settlement

4.2.1 The project totally requires 4 million yuan investment, of which, the civil works needs 1.5 million yuan, the equipment and machinery

including installation cost costs 2.25 million yuan, and the other pre-operation costs adds up to 250,000 yuan (see appendix: 1).

4.2.2 The Capital Resources:

Bank loan: 3,500,000 yuan

Reserve: 500,000 yuan

The bank loan was borrowed through All China Federation of Supply and Marketing Cooperatives. The interest rate is 10.8 %.

4.3 Working Capital Requirement

Since the raw material supply and product marketing are both within the Sanhe cooperatives, the capital turnover is expected to take comparatively less time. In the case of this feed plant, two months is assumed quite reasonable. So, the working capital requirement is calculated for two months as shown in the chart below. (See appendix 2 for detailed calculations)

(in 1,000 yuan)

Year	1991	1992	1993 and onwards
Sum	2,100	2,100	3,200
Intérest	210	210	320

a) The interest rate on working capital is 10%.

b) The working capital increases along with the production increase.

4.4 The Civil Works (See Appendix 4 for the Project Schedule)

The civil works will start around March 15, 1991 and complete by 30th July 1991. Because the construction work is not large and sophisticated, this period of 4.5 months should be enough according to the local construction team.

4.5 Machieries and equipments needed by the plant(See Appendix 1. 2) are all available in our country and even mostly available in cooperatives. The purchasement and transportation of this facilities will be completed by the time the civil works have finished.

4.6 General Information about the Plant

a) The life of the plant: 14 years
 The salvage value: 0

Processing capacity: 5 MT/hour
 Working hours in a day: 12 hours
 Processing days in a year: 250 days
 Production in a year: 15,000 MT

b) Production Plan During the Plant Life:

Year	1991	1992	1993 and onwards
MT of Feed	5,000	10,000	15,000

4.7 Raw Materials

4.7.1 Raw Material Requirement:

a) The major raw material required in processing granulated chicken feed is corn. Supplementary materials include : bran, bean meal, bone powder and various trace elements. The general formula of the granulated chicken feed is shown in the following:

Component	Corn	Bran	Meal	Others	Total
%	56	10	25	9	100

Note: Others include bone power and various trace element, etc.

b) When producing 15,000 MT granulated chicken feed, the factory requires:

Item	Corn	Bran	Meal	Others	Total
Mt	8,400	1,500	3,750	1,350	15,000

4.7.2 Raw Material Procurement

a) Corn -- the major raw material for granulated feed will be supplied to the plant mainly by local farmer members. Corn is non-perishable and easy to store even by the farmers themselves. After harvest, cooperative societies in different places will purchase a certain amount of the total product and store in cooperative warehouses and the left will be stored by member themselves. The cooperative societies or the plant itself will take corn from members from time to time to refill their storages and the factory will get the corn from the primary societies constantly. The surplus of the corn, if any, will be sold to other places or the

closeby feed plants. And if short supply of corn occurs locally, the cooperative plant will also purchase corn from other producers elsewhere.

b) Some supplementary materials, such as bran, bean meal and bone powder are also available locally. Bran can be obtained from a cooperative mill, meal can be got from a cooperative bean oil factory and bone powder is the by-product of a cooperative slaughterhouse. Presently, these raw materials are enough for the 15,000 MT granulated feed. As for various trace elements, the factory will establish long term linkages with several suppliers in different places to secure the supply.

c) The Current Market Prices for Required Raw Materials are listed as below:

Item	Corn	Bran	Meal	Others
Yuan/ton	700-800	600	1,400	3,667

Note: The prices given above maybe little higher than the real ones.

4.8 Processing and Packaging

4.8.1 a) The plant will use very advanced granulated feed production line available in our country. The processing procedure follows the following line:

Raw Material Accepting -- Cleaning -- Milling --
Dispensing -- Pre-Mixing -- Blending --
Granulating -- Packaging.

The equipments required for all the above mentioned operations are listed in appendix 1.2.

b) The whole procedure of the production from the acceptance of the raw material, to processing and to the packaging will totally controlled with computer and supervised with meters. The automatic and mechanic standard of the plant will be among the top ones in our country.

4.8.2 Packaging of the Product

The granulated poultry feed is normally packed into 50 kg packages, but this can be easily adjusted according to the needs. As a matter of fact, it is predicted only half of the product needs to be packed because most individual members and some cooperative farms may use their

own bags or simply purchase in bulk.

4.9 Supply and Marketing of the Product

4.9.1 The product will mostly be supplied to specialized poultry farmer members and cooperative poultry farms. The price will be slightly lower than the other suppliers and the supply will be guaranteed and scheduled according to the requiring time in different growing period of chicken. The poultry feed supply is one of the most important services in poultry farming and poultry farmers can not go without this service. Therefore, the marketing is expected to be out of question.

4.9.2 The marketing will be done in two ways

- a) All the cooperative poultry farms will purchase the feed from the factory and transport to their farms on their own.
- b) For individual members, the plant will send the feed to their doors using its own transportations to the nearby households and through primary cooperative societies to

distanced households. This will be done according to the chick distribution record kept by cooperative societies. The factory or concerned cooperative societies will pay for the transportation expenses.

4.10 Benefit for members

4.10.1 Value Addition for the Corn Producers

- a) The factory will add value to corn for farmer members through processing the product and paying farmers higher purchasing prices for their corn and other materials.
- b) The factory will secure the marketing of corn for producers at a remunerative price.

4.10.2 More Income for the Poultry Farmers

- a) The factory will sell poultry feed at lower prices to specialized poultry farmer members so that their production cost will be reduced and their income from poultry production increased.
- b) The factory will guarantee the supply of feed to

rid members of risk of short supply and price hike in feed from outside.

c) The feed are provided at farmers' door which not only saves the farmers a lot of time and energy but also saves them a lot of transportation cost.

4.10.3 The project will attract more people to join the cooperatives and initiate members' enthusiasm in participating cooperative affairs.

4.10.4 This project can also enrich the cooperative resources for improving future services to members.

4.10.5 This project will directly and indirectly create many employment opportunities for the surplus labours in the rural area.

4.11 The Implementation of the Project

The project will be implemented by Sanhe County Union of Supply and Marketing Cooperatives with the support from Hebei Provincial Union of Supply and Marketing Cooperatives and the All China Federation of Supply and Marketing Cooperatives.

5 ORGANIZATION AND MANAGEMENT

5.1 The Over All Management:

5.1.1 The project will be implemented by the Sanhe County Union of Supply and Marketing Cooperatives.

5.1.2 A general manager will be employed by the board of directors of the county union to manage the plant.

5.2 Management of the Plant

5.2.1 The plant manager will appoint a deputy manager to coop with. Several sections will be established to carry out different necessary functions under the general manager and the deputy manager. The sections to be established are as follows:

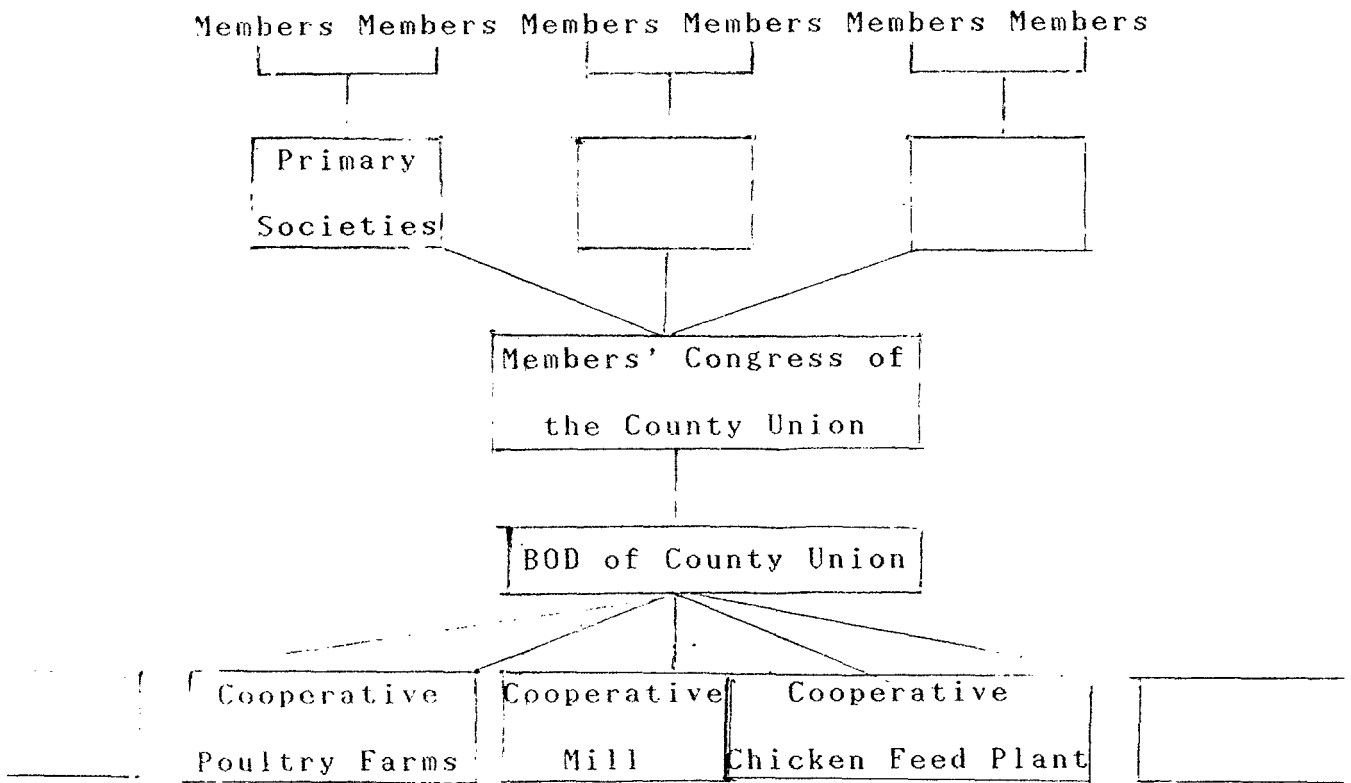
- a) General Management Office
- b) Raw Material Section

- c) Technical Section
- d) Processing Section
- e) Supply and Marketing Section
- f) Accounting Section

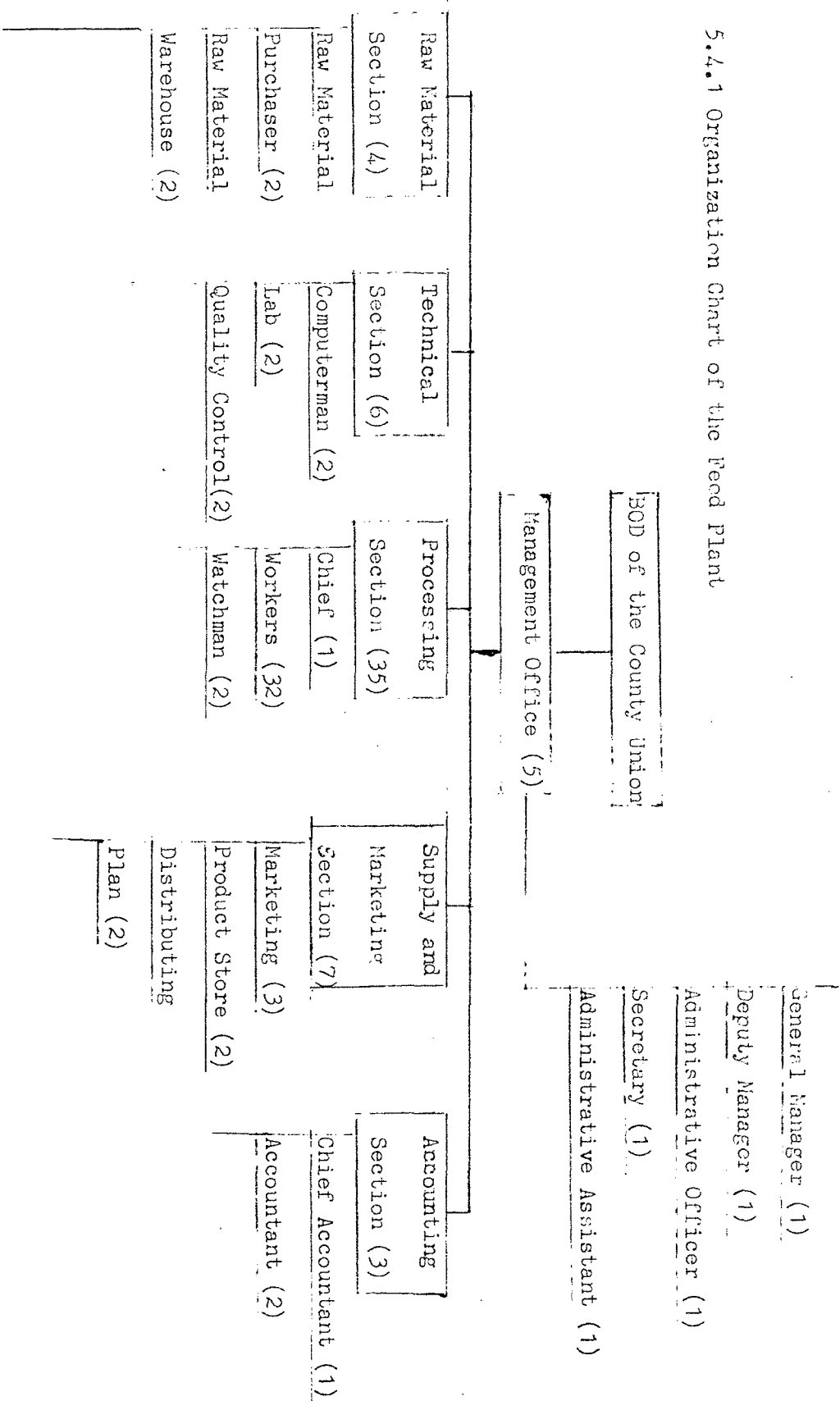
5.2.2 There will be 60 people working in the factory as shown below:

a) General Manager	1
b) Deputy Manager	1
c) Administrative Assistant	1
e) Secretary	1
f) Raw Material Purchaser	2
g) Raw Material Supplier	2
h) Computerman	2
i) Lab Technician	2
j) Quality Controller	2
k) Chief of Workers	1
l) Workers	32
m) Watchman	2
n) Marketing Agent	3
o) Product Warehouse Keeper	2
p) Marketing Plan Maker	2
q) Chief Accountant	1
r) Accountant	2
Total:	60

5.3 General Structure of Sanhe County Union of Supply and Marketing Cooperatives:



5.4.1 Organization Chart of the Feed Plant



5.4.2 Responsibilities of Each Section:

a) General and Deputy Manager

--To manage the whole factory on behalf of the BOD of the county union.

b) Plant Management Office

--to help the general manager and deputy manager in their work and take care of the administrative affairs of the whole plant.

c) Raw Material Section

--To purchase and supply raw materials according to the need and look after the raw material warehouses.

--To be directly in touch with corn producers and collect their advices.

d) Technical Section

--To carry out the computer work, research and to control the product quality.

e) Processing Section

--To process the raw material into granulated chicken feed

f) Supply and Marketing Section

--To market and supply the product according to the record for requirement and hear other feedback informations from poultry farms.

g) Accounting Section

- To take care of the accounting of the plant.

6. FINANCIAL ANALYSIS

6.1 Assumptions Made for the Financial Analysis

6.1.1 The factory life is 15 years starting right from the construction year. The life of buildings, machineries and equipments are calculated on an average basis.

6.1.2 The total capital investment of 4 million yuan including all pre-operation expenditures will be completed in one phase.

6.1.3 Depreciation cost is calculated with an average depreciation rate of 7.2% for the whole investment as decided by the local financial organization.

Depreciation Cost: $4,000,000 \times 7.2\% = 288,000$ yuan

6.1.4 Salvage Value is assumed to be 0.

6.1.5 All the operation and overhead cost are calculated with the reference of the existing

plant of the same kind.

6.1.6 The prices of different raw materials and the product were surveyed from the market. But in my calculation, the raw material prices are taken slight higher and the product price little lower according to the decision of the command cooperative organization.

6.1.7 The income tax is only 15 % of the net profit, so it is put in variable cost for easy calculation.

6.1.8 The factory will process at its full capacity starting from the 3rd year and throughout its life time.

6.2 Working Capital Requirement

(in 1,000 yuan)

Year	1991	1992	1993 and onwards
Sum	2,100	2,100	3,200
Interest	210	210	320

a) One capital turnover takes 2 months

b) Working capital increases with the capacity.

c) Interest rate on working capital is 10 %.

6.3 Production Cost

6.3.1 Fixed Expenses

Item	Sum (in 1,000 yuan)
Wage	144
Administrative Expenses	40
Capital Cost	378
Depreciation	288
Total:	850

a) Administrative Expenses also include some other fixed costs like insurance.

b) Interest on Investment is only taken on the 3.5 million bank loan and the rate is 10.8 %.

c) The depreciation is calculated on an average basis and the rate is 7.2 %.

6.3.2 Variable Cost

(in 1,000 yuan)				
Item	1991	1992	1993	onwards
Raw Material	6,090	12,180	18,270	
Water	1	2	3	
Power	60	120	180	
Fuel	37.5	75	112.5	
Packing	50	100	150	
Others	80	160	240	
Working Capital				
Interest	105	210	320	
Total:	6423.5	12,847	19,275.5	

a) Others include repairing, tax, transportation and etc.

b) The working capital interest for the 1st year is for half a year only since the operation start.

6.4 Financial Analysis (see next page)

6.4.1 The Payback Period of the Project:

a) Before Discounting: 5 years

b) After Discounting: 6 years

6.4.2 Break Even Point:

6.4 Financial Analysis:

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Investment	4,000													
Production (MT)	5,000	10,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Sales	6,900	13,800	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700
Variable Cost	6423.5	12,847	19,275.5	19,275	19,275	19,275	19,275	19,275	19,275	19,275	19,275	19,275	19,275	19,275
Contribution	476.5	953	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5	1,424.5
Fixed Cost	184	184	184	184	184	184	184	184	184	184	184	184	184	184
Cashinflow	6,900	13,800	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700	20,700
Cashoutflow	6,607.5	13,031	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5	19,459.5
Net Cashflow	292.5	769	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5	1,240.5
Cummulative Cashflow	-3,707.5	-2,938.5	-1,698	-457.5	783	2,023.5	3,264	4,504.5	5,745	6,985.5	8,226	9,466.5	10,707	11,947.5
Discounted Cashflow	263.989	626.393	911.965	823.071	742.814	670.432	605.121	546.108	492.868	444.831	401.456	362.388	327.05	295.148

Note: The Fixed Cost Does Not Include Depreciation And Capital Interest.

Total Fixed Cost

$$\text{BEP} = \frac{\text{Total Fixed Cost}}{\text{Price} - \text{Average Variable Cost}}$$

Price - Average Variable Cost

850,000

$$= \frac{850,000}{1380 - 1285.0333} = 8950.5 \text{ MT}$$

1380 - 1285.0333

6.4.3 Net Present Value (Discounting Rate: 10.8 %)

Net Cashflow

$$\text{NPV} = \sum \frac{\text{Net Cashflow}}{(1 + i)^n} - \text{Capital Investment}$$

(1 + i)ⁿ

$$= 7,513,599 - 4,000,000$$

$$= 3,413,599.4 \text{ (yuan)}$$

6.4.4 Internal Return Ratio: (Trial and Error)

+ NPV

$$\text{IRR} = i_2 + \frac{\text{NPV}}{\text{NPV}_2 - \text{NPV}_1} (i_1 - i_2)$$

+NPV - (- NPV)

3,513,599.4

$$= 10.8\% + \frac{3,513,599.4}{3,513,599.4 - (-158,078.3)} (24\% - 10.8\%)$$

3,513,599.4 - (-158,078.3)

$$= 23.43\%$$

6.4.5 Benefit Cost Ratio:

$$\begin{aligned} \text{BCR} &= \frac{\text{Total Discounted Cashinflow}}{\text{Capital Investment}} \\ &= 7,513,599.4 \div 4,000,000 \\ &= 1.878 \end{aligned}$$

6.4.6 Total Income Increased during the Project Life:

a) Total Profit = Total Contribution - Total Fixed Expenses

$$\begin{aligned} &= 18,523,500 - 11,900,000 \\ &= 6,623,500 \text{ (yuan)} \end{aligned}$$

b) Total Raw Material Processed: 195,000 MT

c) Total Corn Processed:

$$195,000 \times 56 \% = 109,200 \text{ MT}$$

6.4.7 Sensitive Analysis

a) When the price of raw material rises by 2 %

$$\text{BCR} = 1.31 \quad \text{IRR} = 18.4 \%$$

b) When the price of product falls by 2 %,

$$\text{BCR} = 1.23 \quad \text{IRR} = 16.8 \%$$

6.4.8 Remarks on the Financial Analysis:

- a) The above financial analysis shows that the project is financially viable. In fact, the plant life could be longer than 14 years and if necessary, the capacity of the plant can be easily brought up to 30,000 Mt/Year.
- b) The prices of both raw material and granulated feed are taken in favour of the members. So, benefit to members is already there in this analysis.
- c) The most vital risk for the plant is the price fall in feed market. But this will not likely happen according to our situation. Furthermore, since the product is for self use and provided with many other services, the price factor may

7. BUDGET

Budget for the First Five Years:

(in 1,000 yuan)

Item	Year:	1991	1992	1993	1994	1995
Sales		6,900	13,800	20,700	20,700	20,700
Fixed Expenses		184	184	184	184	184
Variable Cost		6,423.5	12,847	19,275.5	19,275.5	19,275.5
Capital Interest		288	288	288	288	288
Depreciation		378	378	378	378	378
Net Profit		-373.5	103	574.5	574.5	574.5
Repayment					200	250
Surplus		-373.5	103	574.5	374.5	324.5
Cummulative Surplus		-373.5	-270.5	304.5	678.5	1003

The repayment will begin from the forth year. From 4th year to 6th year, the repayment will be 200,000; 250,000 and 350,000 respectively. From the 7th year on, it will be 400,000 yuan.

8. RECOMMENDATIONS

8.1 To the Sanhe Cooperative Union:

8.1.1 The capacity of the plant can be easily increased simply by expending the processing time so that the factory can also explore markets in other places other than only limiting its production for self-use.

8.1.2 The plant can produce feed for other animals as well, such as pig, duck and cattle with the available surplus processing capacity, which will bring about more income to the farmers.

3.2 To Hebei Provincial Union of Supply and Marketing cooperatives and the All China Federation of Supply and Marketing Cooperatives.

8.2.1 To extend more support to cooperative development project at grassroot level like this one to directly benefit farmer members.

8.2.2 To further coordinate the activities of cooperative societies in different places for their mutual benefit and mutual help.

8.2.3 More emphasis should be put on education and training of cooperative personnel, particularly cooperative leaders at grassroot level so that they will be able to find and grasp opportunities to develop more and better cooperative projects and serve cooperative members more satisfyingly.

8.3 To the State Government

8.3.1 To extend tax exemption treatment and other privileges to newly founded cooperative projects to encourage the growth of them.

8.3.2 To better cooperate with cooperative societies at different level for the sake of promoting rural development.

8.4 To ICA and Its Offices

8.4.1 To develop more projects similar to the ICA / Japan Training Course on Strengthening the Management of Agricultural Cooperatives in Asia so that more cooperators from different countries can also be given the opportunity to learn new and necessary knowledge in cooperative management.

8.4.2 To promote more strongly the exchange and cooperation between cooperatives in different parts of the world.

a) Civil Work Cost:

Item	M ²	Unit Price yuan/m ²	Cost
Main Plant	800	550	440,000
Raw Material Storage	800	200	160,000
Grain Accepting House	60	500	30,000
Supplementary Store	1,000	250	250,000
Product Warehouse	800	250	200,000
Distribution Station	100	400	40,000
Ground Scale	200	400	80,000
Repairing Workshop	100	300	30,000
Water Tower	50t		100,000
Pump House	40	300	12,000
Laboratory	80	400	32,000
Boiler House	80	350	28,000
Others			98,000
Total			1,500,000

b) Equipments Cost

Raw Material Section	94,200
Cleaning Section	131,000
Milling Section	172,000
Dispensing and Mixing Section	413,000
Granulating Section	90,000
Weighing and Packing Section	55,000
Dust Cleaning System	61,000
Oil Adding System	30,000
Initial Mixing System	89,000
Fixing Material	50,000
Installation and Fixing Cost: $1,141,900 \times 15\%$	= 170,000
Transportations of the Equipment: $1,141,900 \times 10\%$	= 110,000
Contingencies: $1,141,900 \times 5\%$	= 60,000
Electronic Equipment	500,000
Lab Facilities	270,000
Total:	2,250,000

List of Machinery and Equipments
Expenditure

Item	Cost
1. Raw Material Section	
Ground Scale	20,000
Hoister	15,000
Scraper	20,000
Riddle	4,000
Perminant Magnetic Tank	5,000
Pulser	6,000
Pneumatic Valve	
Material Indicator	
Sub-total	
2. Bleaning Section (including Supplementary Material Processing)	
Hoister 48/28	45,000
Hoister 36/18	6,000
Scraper	20,000
Crusher	18,000
Pulser	12,000
Perminant Magnetic Tank	10,000
Powder Cleaning Screen	11,000
Pneumatic Tee Joint	9,000
Sub-Total	131,000

Item	Cost
3. Crushing Section:	
Pulverizer	16,000
Pulser Dust Remover	12,000
Governing Feeder	20,000
Grading Sifter	30,000
Moister	48,000
Scraper	20,000
Distributor	13,000
Pneumatic Tee	3,600
Special Conveyer	10,000
Sub-total	172,600
4. Dispensing and Mixing Section	
Container	160,000
Material Feeder	48,000
Dispensing Scale	120,000
Blender	18,000
Scraper	20,000
Material Indicator	18,200
Moister	15,000
Pneumatic Valve	12,600
Pneumatic Tee	1,800
Sub-total	413,600

Item	Cost
5. Granulating Section:	
Granulator	23,000
Cooler	16,000
Crusher	13,000
Grading Sieve	8,000
Wind Generator	3,000
Dust Cleaner	3,000
Moister	24,000
Sub-total	90,000
6. Weighing and Packing Section	
Weight Control Packing Machine	55,000
Sub-total	55,000
7. Dust Cleaning Section	
Pulser	22,000
Air Compressor	16,000
Air Container and Separator	8,000
Wind Screen	15,000
Sub-total	61,000
8. Oil Adding System	30,000

Item	Cost
9. Pre-mixing System	22,000
Scale	3,000
Feeder	7,500
Blender	12,000
Moister	44,500
Sub-total	89,000
10. Electronic Equipments	50,000
11. Lab Facilities	27,000
Total:	1,911,900

APPENDIX 3.

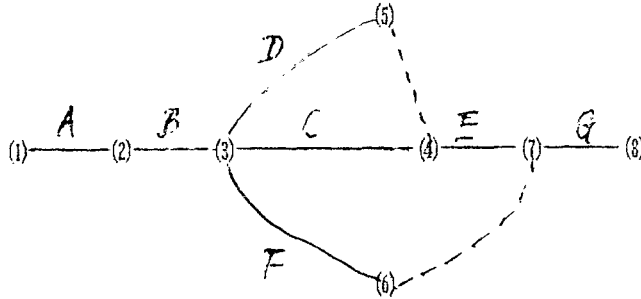
Working Capital at the Capacity of 15,000 MT:

Item	Sum
Raw Material	3,045,000
Water	500
Power	30,000
Fuel	18,750
Wage	24,000
Package	25,000
Working Capital Interest	53,333
Administration	6,666
Others	40,000
Total	3243,249

- a) One turnover is assumed to take two months.
- b) In other calculations, the working capital is roughly taken as 3.2 million.

APPENDIX 4.

Project Schedule:



MONTH ITEM	1	2	3	4	5	6	7	8	9	10	11	12
A	—											
B		—										
C			—	—	—	—						
D			—	—	—	—						
E							—					
F		—	—	—	—	—	—					
G								—	—	—	—	—

A. Feasibility stude and project designing

Jan 1, 1991 -- Feb 15, 1991

B. Settlement of the required capital.

Feb 15, 1991 -- March 15, 1991

C. Civil works

March 15, 1991 -- June 30, 1991

D. Purchasing the mechinaries and equipments

May 1, 1991 -- June 30, 1991

E. Installing and adjusting machines

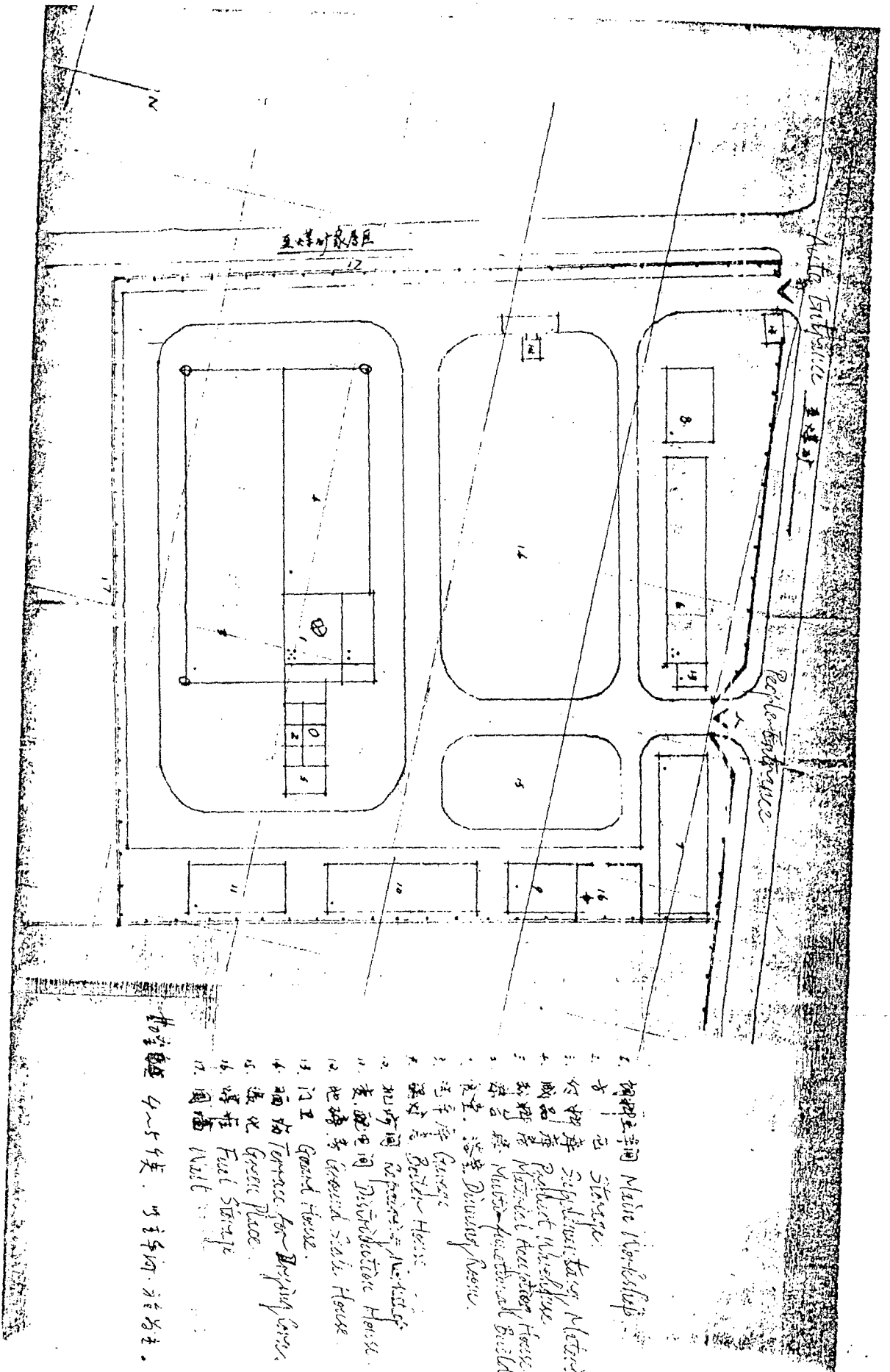
July 1, 1991 -- July 31, 1991

F. Training of workers

June 1, 1991 -- July 31, 1991

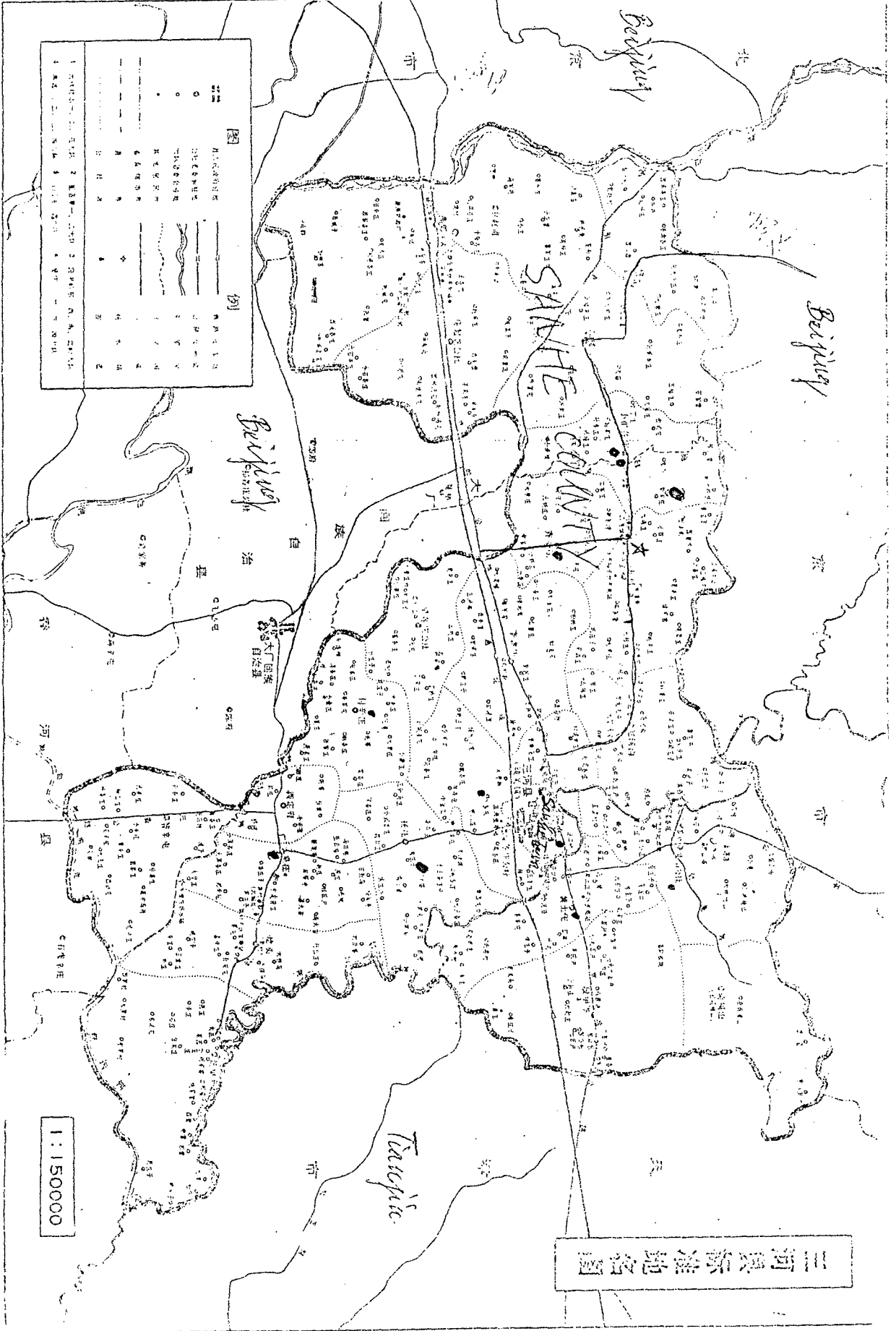
G. Trial operation

July 31, 1991 -- Dec. 31, 1991



1. 物料车间 Main Workshop
 2. 仓库 Storage
 3. 包装材料 Material Warehouse
 4. 包装材料 Material Warehouse
 5. 办公室 Office
 6. 浴室 Bathroom
 7. 汽车库 Garage
 8. 厕所 Toilet
 9. 配电室 Distribution House
 10. 玻璃房 Glass House
 11. 门卫 Guard House
 12. 晒场 Terrace for Drying Cans
 13. 绿化 Green Place
 14. 煤渣 Fuel Storage
 15. 围墙 Wall
- 五洋村公路
 Vila Etienne
 Peklembanane
- 北

三河農地名辦公室一九八三年七月制



• Cooperative Paddy Farm
* The Project Location

Fifth ICA/Japan Training Course for
Strengthening Management of
Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

TITLE OF PROJECT	INTEGRATED CHINESE OWN
COUNTRY	: PRODUCTION, PROCESSING AND MARKETING PROJECT
PROJECT PREPARED BY	: CHINA MR HUANG YA DONG

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

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ACKNOWLEDGMENTS

The fourth ICA/Japan course for strengthening management of agricultural cooperatives in Asia (October 22th, 1990 - May 10th, 1991) is a very good opportunity in understanding the concept of the integrated cooperatives and the management for me.

Also it has given me a good chance to understand various aspects of agricultural cooperatives of south-east Asia countries and have more interested in the ways of increasing the farmers' income as well as the agricultural situations and the management problems.

The Producing Processing and Marketing of Chinese Onion of Tou Zheng Primary Agricultural Cooperative was prepared under this course-programme. For giving me this valuable opportunity, I would like to express my gratitude to ICA in New Delhi and the professors of I IM in Amedabad, and specially to project director of I C A Mr. M. V. Madane.

Huang Yitong

February 1, 1991

in Wuhan, China

I SUMMARY

This project will be pressed cooperative principle to management. It will be separately business accounting, and undertaken benefit even. Carrying out integral of Chinese onion producing, purchasing and processing, raising output and quality of products, and cutting down capital of products, increasing income of farmer members and accumulation of cooperative.

- 1.1 Main Raw Materials: Chinese Onion
- 1.2 Methods of Processing: Purchase Processing
- 1.3 Breed of Processing: Salt Chinese Onion Sweet
Chinese Onion Mixed Vegetables
- 1.4 Sum Total Capacity (unit: M/T, day)

item	1st year	5th year
total	340	740
salt	200	300
sweet	20	200
mixed	120	240
daily capacity	14.2	25
working days	200	300

1.5 Investment (unit: ten thousand)

land	mill	pool	jar	goods warehouse	machinery	others	total
12	14.6	3.85	1.35	0.15	1.4	3.65	37

1.6 Financial Analysis

- 1.6-1 Pay Back Period: 5 years
- 1.6-2 Break Even Point(first year): 194.45; 19.45; 116.75 M/T
- 1.6-3 IRR: 21.8 %.
- 1.6-4 BCR: (at 16.94 %).
- 1.6-5 Giving Farmer Members' Profit (5 years): 2,805 million yuan.

II BACKGROUND

The area of the project lies in Tou Zheng of Zhou City where is Hubei provincial southern bank of Long river. This town nearly mountain and lake. Climate is proper, and rain is enough, and land is fertile. To grow Chinese onion with very good conditions. Chinese onion which was produced here is very famous. It is a good breed of vegetables, and cultivated history is very long. Fresh Chinese onion here exported to Malaysia and Hong Kong ago. All town have ten villages with 5004 household and 18 thousand population. Among them, have cultivated Chinese onion 3000 of farm household, at 60 per cent of total farm household. There are cultivated area 2800 ha. There also are mountain area 2600 ha. There are cultivated Chinese onion area about 100 ha. Total output the least is 0.6 million kg. per year. Output of the highest is 2.25 million kg. per year. Exporting Chinese onion capacity the highest is 2.2 million kg. per year.

Tou Zheng supply and marketing cooperative started to set up Chinese onion processing mill in 1973. In that time, it's main production method by hand. Peasants cultivated in disperse and fragmentary, and output of unit is very lower, and capacity is very litter, and Chinese onion did not sell well, purchase price is only 0.2 yuan per kg. In order to development production, extending export, procure foreign exchange for country, this supply and marketing cooperative has started investment since 1973. The Chinese onion processing mill had been set up, and it was belonged to the supply and marketing cooperative, and business accounting is not separately, management is improper, adding exporting was influenced by international market, it has been often lost money in business, for example, it lost 0.4 million yuan in 1984.

For this reason, this processing mill will be separated out from the supply and marketing cooperative, and it be pressed principle of cooperative to management, it will be separately businesssed

accounting and undertaken benefit even. To organize farmer members put their share. And original fixed assets net present value 250 thousand yuan as investment of the supply and marketing cooperative put into new Chinese onion processing mill. Beside, the supply and marketing cooperative row out 300 thousand yuan from original loan for cashflow of the processing mill. Both fixed assets and cashflow were used will pay interest. On basis, to set up Tou Zheng Chinese onion production cooperative mill and carry out the integrate development of production, processing and marketing. Favourable condition of development this project as follows:

1) This product is exported, it will be able to procure foreign exchange for country, and it will procure both government of province and city to support, and foreign trade department will support too.

2) Chinese onion here is high quality with very strong competition power.

3) This product have certainly basis.

4) There is very large latent capacity in domestic market.

5) Peasants expect cooperative to help them with production and marketing.

Of course, there also is certainly difficulty to develop this project.

1) There are two Chinese onion processing mill in Tou Zheng, competition will be certainly sharp.

2) Chinese onion harvest season is very short and need fund of large numb.

3) Chinese onion exporting will be influenced by international market.

In a word, this project will be able to develop.

III THE PROJECT OF CHINESE ONION PRODUCING, PROCESSING AND MARKETING

The main aim of this project lies in service expansion, and the enhancement of the farmer members income. The detailed objectives are as follows:

1. Drawing farmers of planting Chinese onion join cooperative and selling their products to cooperative.

1) There are farm household 3000 of planting Chinese onion in the all town, and win between 60 to 80 per cent of farm households join cooperative with 1800 to 2400 households.

2) Season worker will be selected from farm members.

3) Suing high quality chemical fertilizer exchange Chinese onion with farmer members.

4) The end of per year draw extra dividends to farmer members.

5) Prociding other preferential to farm members.

3.1-2. Guiding production of farmer members.

1) According to plan of foreign trade department and domestic selling plan sign a contract with farmer members before planting. And help farmer members to carry out production task.

2) To select good seed to provide to farmer members.

3) Providing two technician to guiding farmer members to produce.

4) Supplying chemical fertilizer and pesticide that farmer members needs of planting Chinese onion, and price is preferential.

5) Organizing expert of planting Chinese onion among farmer members to guiding production.

3.1-3. Guiding farmer members to harvest at the right moment.

4. Expanding processing.

1) Processing capacity: from 340 M/T of 1st year increase to 740 M/T of 5th year.

2) Breed: Salt Chinese onion.

Sweet Chinese onion.

Mixed vegetables.

3) Standards:

- Double-deck pack: a. 20KG
b. 10KG
- Bottled : a. 1 KG
b. 0.5 KG
- Plastics bag : a. 2 KG
b. 1 KG

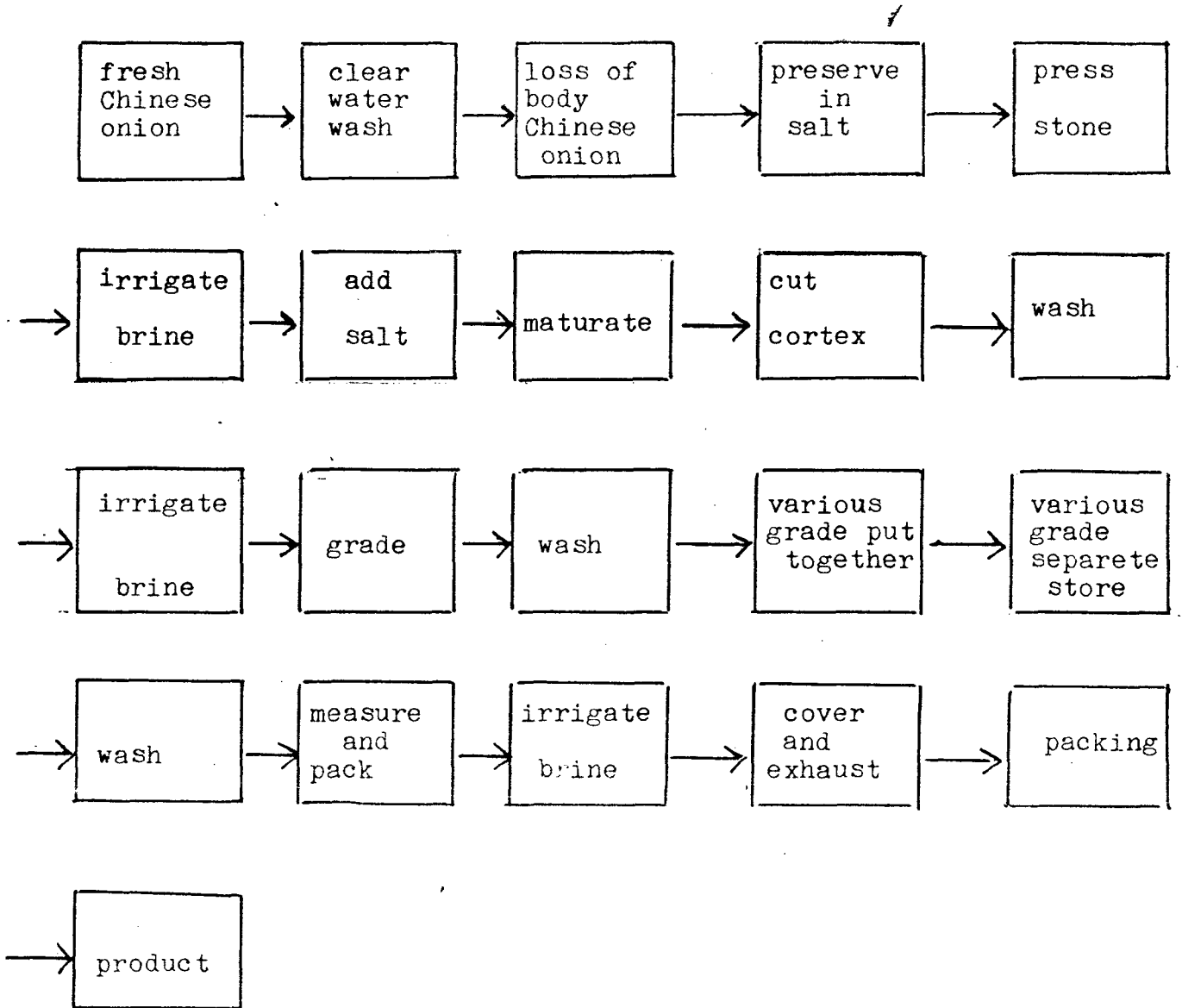
5. Expanding Selling:

- 1) To export to Japan
- 2) Domestic market:
 - a. Wholesale shop.
 - b. Retail shop.
 - c. Guesthouse.
 - d. Factory.
 - e. University.
 - f. On train
- 3) To strengthen sale-advertisement.
- 4) To sell by all staff and farmer members.
- 5) Arrange person specially to sell and integrate with benefit.

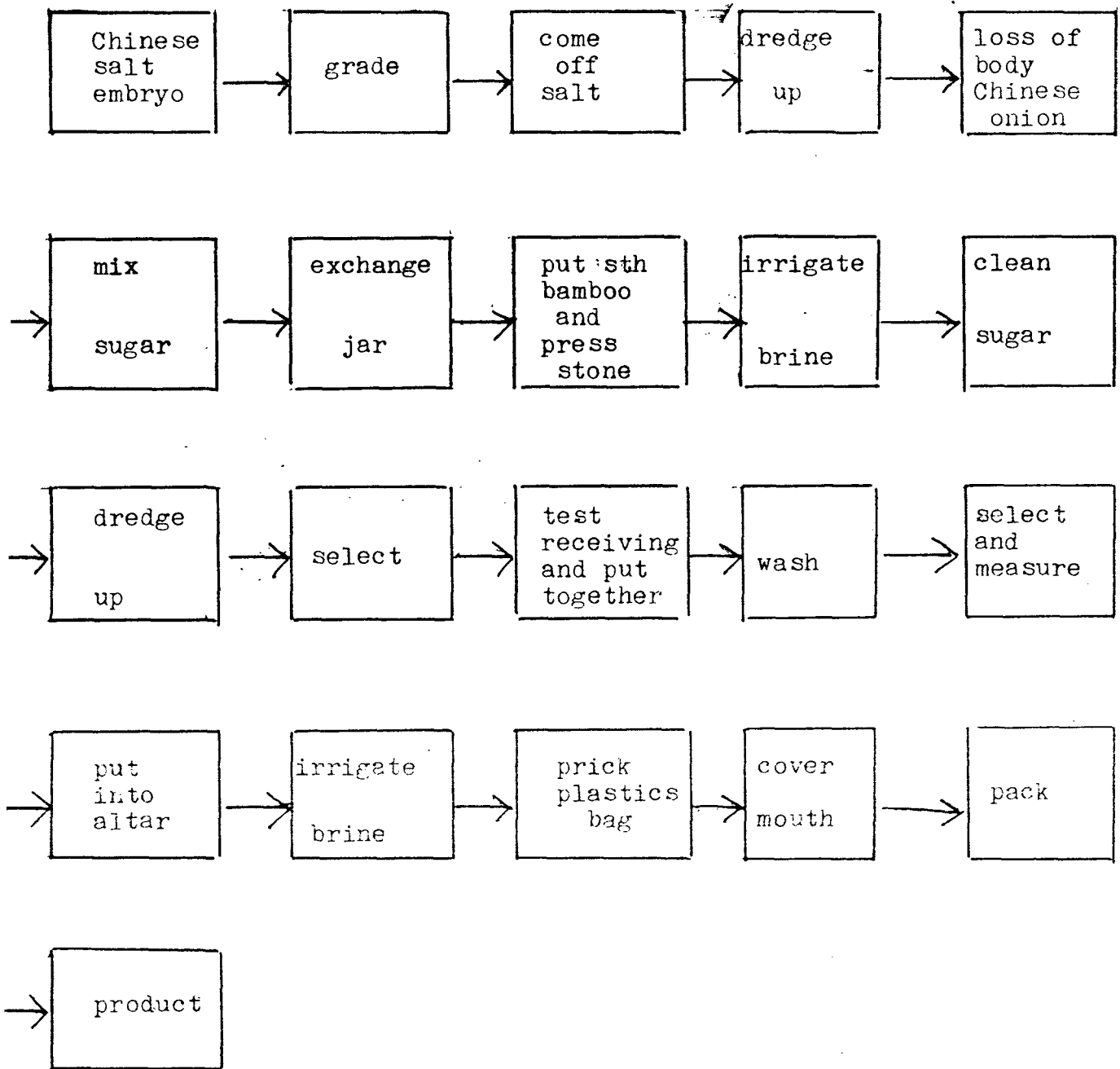
6. Procurement of raw materials: Raw materials will be provided in this area and from adjacent areas where Wuchang, Wusheng county and Jiang Xi province.

7. Processing Procedures.

Salt Chinese Onion Processing Procedures



Acid-Sweet Chinese Onion Processing Procedures



8. Processing capacity

(unit: M/T)

item	total	salt Chinese onion	acid-sweet Chinese onion	mixed regetables	raw material
1	340	200	20	120	615
2	440	225	65	150	795.9
3	540	250	110	180	976.8
4	640	275	155	210	1157.7
5	740	300	200	240	1338.6

9. Transportation.

Mainly rely on cars of foreign trade department and supply and marketing cooperatives.

10. Season of harvest and Processing

item	1	2	3	4	5	6	7	8	9	10	11	12
Chinese onion	← --- →					← --- →						
onion					← --- →		← --- →					

* Season of harvest: ← --- →
 Season of processing: ← --- →

IV ORGANIZATION AND MANAGEMENT

4.1 Overall Management Policy.

Deputy meeting of farmer members and board of directors will be set up in Tou Zheng's Chinese onion production cooperative mill. Business and management policy will be determined in the general assembly or board of directors. There is a direct chairman of the board. There are a manager and two vice manager will be engaged by the board of directors. All staffes will be engaged too.

4.2 Details of Management.

4.2-1 Procurement of Raw Materials

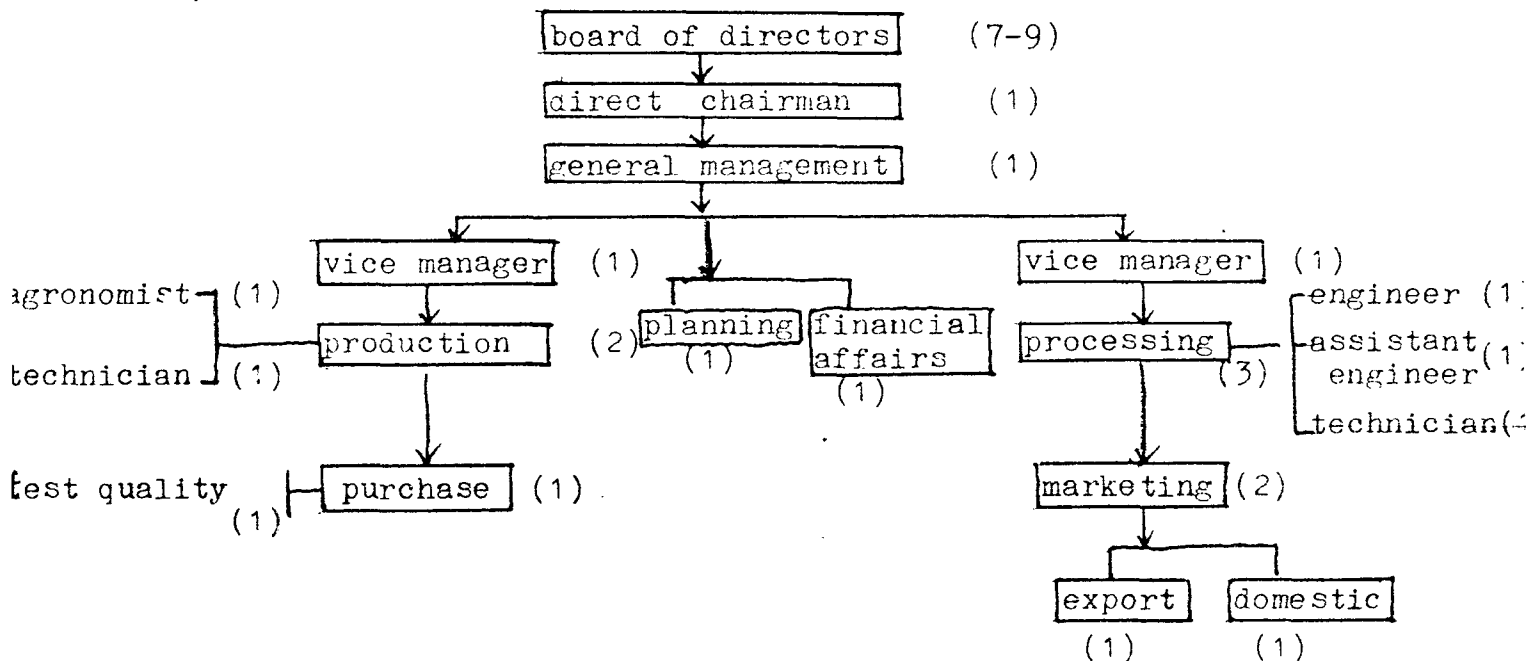
4.2-2 Processing

4.2-3 Marketing: Export
 Domestic

4.2-4 Planning and Accounting.

4.2-5 Administration and General Management.

4.3 Organization Chart



4.4 Task of each Division

4.4-1 General Manager:

- a. To take general responsibility for production, purchase, processing and marketing.
- b. To take responsibility for planning and financial affairs.
- c. To take responsibility for workers control.

4.4-2 Vice Manager

- a. To be assigned personal responsibility for production and purchase of Chinese onion, and the end of year draw extra dividends to farmer members.
- b. To be assigned personal responsibility for processing and marketing of Chinese onion.

4.4-3 Task of each department

1) Production Department

- a. Planning of plant.
- b. Guiding technical
- c. To survey price of purchase
- d. Farmer members put share into coop.

2) Purchase Department

- a. Purchase products according planning at fixed time and address.
- b. To check in number that farmer members sell products.

3) Processing Department

- a. Processing production
- b. machinery maintenance and repair
- c. Suing and management of season labour

4) Marketing Department

- a. Export and domestic marketing
- b. Transportation, storing, inventory control
- c. Collecting market information
- d. Searching of market development
- e. Advertisement

5) Planning Department

- a. To link up planning of production and marketing
- b. To keep accounts
- c. To hold a concurrent post teller

6) Financial affair

- a. Report forms
- b. Financial analysis
- c. To work out system of management
- d. Fund was used and received
- e. To work out assign plan

4.4-4 To set up group of farmer members.

V FINANCIAL ANALYSIS

5.1 Cashflow account table

(unit: ten thousand yuan)

item	0	1	2	3	4	5
net cashflow	-87	3	14	25	36	120
net cashflow clusters of value	-87	-84	-70	-45	-9	111
net cashflow present value (i=15%)	-87	+2.61	10.59	16.44	20.58	59.66
net cashflow present	-87	-84.39	-73.8	-57.36	-36.78	22.88

5.2 Pay back period of investment: 5 years

$$T = 5 - 1 + \frac{36.78}{59.66} = 4.61 \text{ year}$$

The pay back period of investment is shorter than life of the project, so it is able.

5.3 NPV (i=15%)

$$\begin{aligned} NPV &= \sum_{i=0}^n CF_i / (1+i)^i = -87 \times 1 / (1+0.15)^0 + 14 \times 1 / (1+0.15)^2 \\ &\quad + 25 \times 1 / (1+0.15)^3 + 36 \times 1 / (1+0.15)^4 \\ &\quad + 120 \times 1 / (1+0.15)^5 \\ &= 22.88 \end{aligned}$$

5.4 Break Even Point (first year)

(unit: ten thousand yuan)

item	salt	acid-sweet	mixed	total
sales income	62	10.2	4.8	77
sales cost variable cost				61.08
contribution margin				15.92
fixed cost				15.48

$$\text{contribution margin ratio} = \frac{15.92}{77} = 0.20675$$

$$\text{break even sales forehead} = \frac{15.48}{0.20675} = 74.87$$

$$\text{products sales forehead} = \frac{62}{77} \times 74.87 = 60.28$$

$$\text{salt products output} = \frac{60.28}{0.31} = 194.45 \text{ (T)}$$

$$\text{acid-sweet products sales forehead} = \frac{10.2}{77} \times 74.87 = 9.92$$

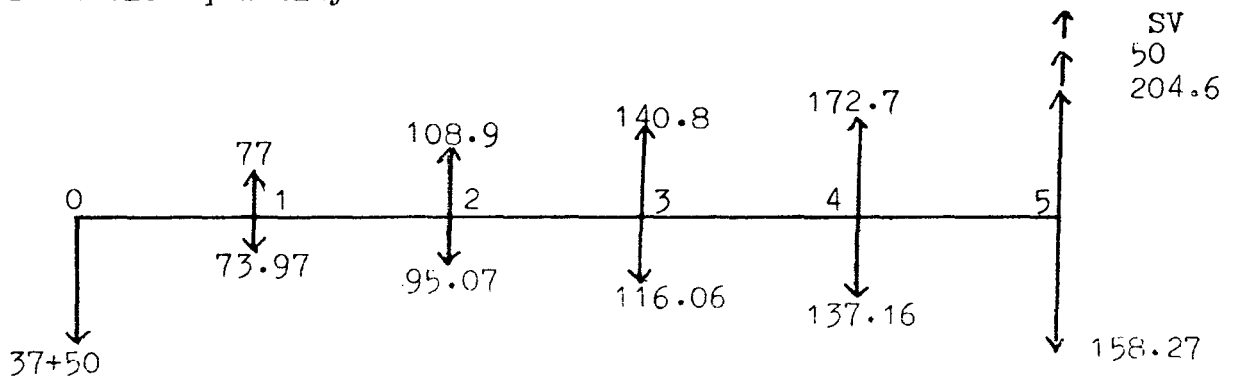
$$\text{acid-sweet products output} = \frac{9.92}{0.51} = 19.45 \text{ (T)}$$

$$\text{mixed veg. sales forehead} = \frac{4.8}{77} \times 74.87 = 4.67$$

$$\text{mixed veg. products} = \frac{4.67}{0.04} = 116.75 \text{ (T)}$$

$$\text{break even point: } 194.45\text{(T)}, 19.45\text{(T)}, 116.75\text{(T)}$$

5.5 Fund flow quantity chart



building NPV=0 equation

$$\text{NPV} = -87 + 3x1/1+i + 14x1/(1+i)^2 + 25x1/(1+i)^3 + 36x1/(1+i)^4 + 120x1/(1+i)^5 = 0$$

$$i = 21\%$$

$$\text{NPV}(0.21) = -87 + 2.48 + 9.56 + 14.11 + 16.79 + 46.27 = 2.21$$

$$i = 25\%$$

$$\text{NPV}(0.25) = -87 + 2.4 + 8.96 + 12.8 + 14.75 + 39.32 = -8.77$$

$$\text{IRR} = 21\% + \frac{2.21}{2.21 + 8.77} (25\% - 21\%) = 21.8\%$$

Because IRR=21.8%, it is bigger than discount rate 15%.

So it is able.

5.6 Cost profit ratio

5.6-1 Total cost present value (TCPV)

$$\begin{aligned} \text{TCPV} &= (73.97+2.59) \cdot 1/1+i + (95.07+2.59) \cdot 1/(1+i)^2 \\ &\quad + (116.06+2.59) \cdot 1/(1+i)^3 + (137.16+2.59) \cdot 1/(1+i)^4 \\ &\quad + (158.27+2.59) \cdot 1/(1+i)^5 \\ &= 66.58+73.84+78.01+79.91+79.98 \\ &= 378.32 \end{aligned}$$

5.6-2 Total profit present value (TPPV)

$$\begin{aligned} \text{TPPV} &= 0.47 \cdot 1/(1+i) + 11.24 \cdot 1/(1+i)^2 + 22.19 \cdot 1/(1+i)^3 \\ &\quad + 32.95 \cdot 1/(1+i)^4 + 43.74 \cdot 1/(1+i)^5 \\ &= 0.41+8.5+14.59+18.84+21.75 \\ &= 64.09 \end{aligned}$$

5.6-3 Cost profit ratio (CPR)

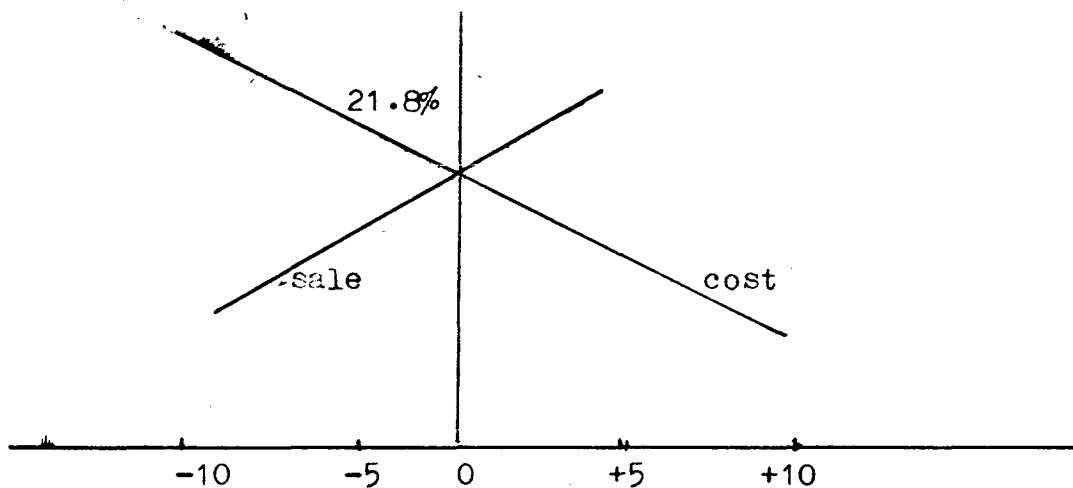
$$\text{CPR} = \frac{\text{TP}}{\text{TC}} = \frac{64.09}{378.22} = 16.94\%$$

5.7 Sensibility analysis

To select influence factors: Products cost and products sales quantity to according to +10%, +5% undefined accounting will influence to IRR.

Undefined factor will influence to intestine income rate

variable rate vari- able factors	+10%	+5%	0	-5%	-10%	aver- age +1%	aver- age -1%
products cost	10.32%	16.33%	21.8%	25.9%	32.25%	-1.13%	+0.97%
products sales quantity	24.93%	23.38%	21.8%	15.14%	10.46%	+0.315%	-1.2%



Both of statement and chart are showing: intestine income rate to decreasing of products and products sale quantity, viz. product overstock will have very sensibility. So this project focal point will first lay on decreasing production cost second products will can not overstock.

5.8 Cashflow requirement quantity

(unit: ten thousand yuan)

item		1 year	2	3	4	5
variable fund quantity		69.7	94.37	118.93	143.6	168.28
fixed fund quantity		7.9	7.9	7.9	7.9	7.9
total fund quantity	turnover once	77.6	102.27	126.83	151.5	176.18
	turnover two onces	38.8	51.12	63.42	75.75	88.09

5.9 Investment interest

(unit: ten thousand yuan)

item	1 year	2	3	4	5
fixed investment interest	3.7	3	2.3	1.6	0.9
cashflow interest	3.69	3.15	4.11	5.81	6.77
total interest	7.39	6.15	6.41	7.41	7.67

Account interest at 15% per year.

5.10	Farmer's income	
5.10-1	Production cost per ha:	3330 yuan
1)	seed:	1440 yuan
2)	fertilizer:	975 yuan
3)	pesticide :	150 yuan
4)	input labour	765 yuan
5.10-2	Income of the per ha:	9000 yuan
5.10-3	Profit of the per ha:	5670 yuan
5.10-4	Total output of the 100ha:	
	100 ha. x 18750kg=1.875 million kg.	
5.10-5	Profit of 100 ha. the per year to farmer's income:	
	2.805	million yuan

Amended

Fifth ICA/Japan Training Course for
Strengthening Management of
Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

CPD

<i>TITLE OF PROJECT</i>	: FRUIT PROCESSING UNIT AT NARKHED, DISTRICT NAGPUR, MAHARASHTRA STATE.
<i>COUNTRY</i>	: INDIA
<i>PROJECT PREPARED BY</i>	: ZILEY SINGH

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

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ACKNOWLEDGEMENTS

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives organised from 22nd October, 1990 to 10th May, 1991 at New Delhi, Bangkok, Tokyo and Seoul has provided me with an opportunity to learn various aspects regarding the strengthening the management of agricultural co-operatives. The training course has also provided me to learn the techniques of formulation and implementation of projects in co-operative sector. In fulfilment of the requirements of this training course, I have attempted to design a project. The Project of "Establishment of Fruit Processing Unit at Narkhed, District Nagpur, Maharashtra State" is prepared under this training programme.

I am grateful to Shri M.V.Madane, Project Director, ICA, New Delhi, Professors S/Shri A.H.Kolro, G.S.Gupta, V.R.Gaikwad and Ramesh Gupta of Indian Institute of Management, Ahmedabad, who guided in completion of my project.

I am also grateful to the Deptt. of Agri & Cooperation, Government of India for nominating me to the training programme and extending me all the support in formulating the project. My very Special thanks also go to the Government of Japan who funded for this programme.

I am grateful to Shri Harish Bhai Thakkar, Promoter-Director, of the society and Shri P.V.Kurve, Project Co-ordinator at Narkhed and other orange growers in Narkhed area, who imparted valuable information for project formulation. I am also grateful to Shri B.C.Mathur, Consultant, fruit & Vegetables, NCDC, who has given valuable guidance in formulating the present project.

Lastly, my thanks are also due to the Co-operative Officers, staff of other different Departments of Narkhed (Nagpur Distt), who rendered all possible assistance during data collection, field study and shared their ideas with me.

(ZILEY SINGH)

CHAPTER-I

SUMMARY

1. Proposal: Establishment of fruit processing unit to be set up by Vasantdada Sahakari Santra (Orange) Prakriya (Processing) Karkhana Ltd., Narkhet, Distt. Nagpur.
2. Proposed Location: Narkhed, District Nagpur, Maharashtra.
3. Objective of the Project: To increase the net income of fruits and vegetable farmers and advance their overall socio-economic condition by taking up procurement, processing and marketing of their produce.
4. Benefits to farmer members: Procurement of farmers' produce at farm level - Extending technical assistance to the farmers/growers for improving the yield, quality - higher price to members at the rate of Rs.2.10 per kg. against the existing price of Rs.1.70 per kg.- likely bonus to the members on supply of the produce.
5. Plant and Machinery. Imported
6. Capacity: 80 tonnes per shift or 200 tonnes per day on 3 shifts basis.
7. Raw Material requirements:

(in tonnes)	
Orange	33,750
Lemon	10,400
Tomato	6,400
Mango	6,200

8. Product Mix (in tonnes)	Orange Juice concentrate	2700
	Lime Juice concentrate	810
	Tomato paste	912
	Mango Pulp	1688
9. By-Product (In tonnes)	Essential oil (Orange)	40.50
	Peel oil (Orange)	54.00
	Essential Oil (Lemon)	10.00
	Peel Oil (Lemon)	13.50
	Tomato Seeds	60.00
	Mango seed	800.00

10 Capital cost of the project (Rupees in lakhs)

Land & Development	5.35
Civil works	46.55
Plant & Machinery	519.10
Imported	460
Indegeneous	59.10
Pre-operative expenses	106.00
Margin Money	150.00
contingency	40.00
Total	<u>867.00</u>
Trng. & other Dev. services.	23.50
Grand total	<u>890.50</u>

11. Sources of Finance (%. lakhs)

a. Loan from N.C.D.C. through State Government (70% of the project cost of Rs. 867 lakhs).	606.90
b. Share capital From State Government (22.5 % of the project cost of Rs. 867 lakhs).	195.0

c. Share capital from member growers (7.5% of the project cost of Rs. 867 lakhs)	65.02
d. Subsidy for training and development services (50% of the total cost of Rs. 23.50 from each of NCDC and State Govt.	23.50
Total	<u>890.50</u>

12) Results of Financial Analysis

NPV = 55.06

BCR = 1.06

Payback = 6 years

IRR = 16%

Break-even sales = 50.4%

Debt - Service coverage ratio = 1.18 (2nd year)

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Chapter-II

BACKGROUND

2.1 India is endowed with rich horticultural resources. Fruit cultivation is an important remunerative source of income for farmers. It provides both revenue as well as work and thus enables the farmer to meet his liabilities. Fruits also provide vitamins as well as nutrient food for the society. The total annual production of fruits and vegetables in the country is estimated as 55 million tonnes. It is also estimated that 20-25% of the produce goes waste due to inadequate post-harvest management. At present, only about 0.5% of the total production is being processed, thus opening a tremendous scope for processing. Hence, it will be very advantageous to set up a modern fruit processing unit to utilise some of the surplus production of fruits and vegetables in Nagpur District.

2.2 The proposed unit will be based mainly on processing of orange, lemon, mango and tomato into concentrate and will handle about 200 tonnes of raw materials per day on three shifts. The product will be packed aseptically in multi-layered laminated flexible bags. The critical machinery and equipment would be imported. The proposed processing unit will be the first of its kind in the country in the co-op. sector.

2.3 An on-the-spot study was carried out by visiting various fruit growing areas in Nagpur district. The matter was discussed with the farmers, officials of the Horticulture and Co-opn. Deptts., fruit and vegetable growers and Chairman, Agricultural Produce Marketing Committees. It was concluded that establishing a fruit processing unit by the co-op. society will help the farmers to increase their income.

CHAPTER-III

The Project

3.1 The proposed processing unit would be established by vasantdada Sahakari Santra Prakriya Karkhana Ltd. at Narakhed, which is a taluka town in Nagpur district and is about 90 Kms from Nagpur. The area of operation of the Society has been extended to 9 talukas (i.e. 2 Talukas in Nagpur District, 4 Talukas in Amraoti District and 3 Talukas in Wardha District). During implementation, the society will provide a package of services to the farmers. It will provide backward linkages, such as supply of good seeds/plants, extension services, coordination, transport facilities, etc. supervision of member's orchards, increase in area and increase in yield. Also, forward linkages of marketing juice concentrate paste, pulp, etc. will be provided. The proposed unit would be using imported technology in processing of fruits and vegetables, as such, its products will be of high quality comparable to the international standards. Besides, providing steady increase in the income of small and marginal farmers, particularly those of orange, lemon, and mango growers it will also earn foreign exchange from likely buy-back arrangement/guarantee from the exporter of plant and machinery as also from the direct exports in the international markets.

3.2 The society has to import a sophisticated multi-effect concentration plant and aseptic packaging unit. The matter for importing plant and machinery was discussed with concerned officials of Deptt. of Co-opn. and also promoters of the society.

3.3 For the past several years, the fruit processing industry in the country has been operating on conventional lines, and there was practically very little change in the technology of processing and packaging. The conventional packaging materials like glass bottles are in use since long. Due to exorbitant increase in the cost of packaging materials and other inputs, and consequent consumer resistance, the industry felt the need to reduce the cost of production and improve the quality with the help of new technology.

3.4 It is reported that at present, no firm in the country is manufacturing machinery for production of fruit juice concentrate of high degree on continuous basis. The society has to import machinery for continuous process. The international market demands high quality products, which can be produced only with an integrated processing system. As the significant segment of the total production would be exported, such type of integrated machinery and equipment is essential.

3.5 It is given to understand that such type of plant and machinery are available with the following companies:-

Alfa Level, Sweden.

Akar Impex, Italy.

Fomexa Italia, Italy.

International Machinery Corporation, Spain

Titi Majini, Sp.A., Italy

It is gathered that at present two technologies for aseptic packaging being used extensively world-wide. One is for aseptic packaging of pulps/concentrates in pre-sterilised flexible bags, which are in turn packed in cardboard cartoons/drums. The other technology is to pack juice, concentrate, pulp in laminated packs. In the former system, arrangement for packing pulps/concentrates are made for a capacity of 2 ltr. - 200 ltr. while the second system upto 1 ltr. capacity can be packed. Thus, for the proposed unit, which intends to pack concentrate/pulps for industrial use have to depend on the first technology. The other technology will be suitable for the unit manufacturing consumer packs.

CHAPTER - IV

Availability of raw material

4.1 Orange-Present marketing practices:

The soil and climatic conditions of Nagpur region are conducive to production of citrus fruits. The northern part of Nagpur district is the major fruit producing area. This district leads in the production of orange in the country followed by Amarvathi and Vārda districts. The major raw material required by the proposed unit will be orange.

4.2 There are two orange seasons in the State of Maharashtra. The first is ambiya season, which is harvested from October-middle December. The second season called Mrijabahaar commence from February and lasts upto middle of April. All the markets in the State are Govt. regulated. The grower farmers generally bring their produce in the bullock carts (capacity about 350 kg) to the nearest mandi, where it is auctioned in the presence of the farmers. The auctioner charges a commission of 2.5% of the value from the trader while the grower farmers has to pay 1% as Market Fee. The produce is then graded and packed in cases and sent to various terminal markets. It was reported that total expenses involved in sending one orange box containing 110-198 number to Delhi is Rs.40 per box, which includes Rs.11 of cost of box and other packing materials. It takes about 7 days by rail to Delhi while the road transport takes 3-4 days. It was reported that Delhi and Punjab are the best markets for oranges. Calcutta and Madras require second grade material while consumption of orange in Bombay was reported to be very limited. The rate of Azadpur market in Delhi generally fluctuates from Rs.80 per box - Rs.120 during the season depending upon the quality of the fruit.

The growers/farmers are getting about Rs.2-2.25 per kg. for 'A' Grade and Rs.1.50 -1.80 per Kg. for 'B' Grade. The value of lower grade fruit is very low and it was reported that in many cases, small fruits were given free along with graded fruits.

4.3 The following taluka markets in Nagpur district are important for orange production and sales:

Narkhed
Katol
Nagapur
Kalmeshwar
Sawner
Kohi
Savargaon and
Kalamba

The first four markets are the biggest markets for orange. It was reported that even though the markets are regulated, substantial portion of the produce, duly packed in cases, goes directly from the farm to terminal markets which is not recorded in the Agricultural Produce Market Committees. The arrivals in the 5 important markets during 1989-90 were as under:

	88-89	89-90
87-88		
14000	11,300	12,000 tonnes
9300	29,000	30,000 tonnes
23000	17,000	18,000 tonnes
22200	28,000	33,000 tonnes
5300	06800	7,500 tonnes
73800	92100	100,500 tonnes
	Total	

4.4 Total production of oranges, mosambi, lemon, tomato and mango in the main grown areas are as under:

Taluka	(Production in MtTs)				
	Orange	Mosambi	Lemon	Tomato	Man
Narkhed	86498	419	720	8975	38
Katol	70528	413	381	7852	27
Hingna	12339	275	83	3977	23
Nagpur	22015	26	122	9854	24
Kamleshwar	67132	431	193	6354	9

<u>Taluka</u>	(production in M.Ts)				
	<u>Orange</u>	<u>Mosambi</u>	<u>Lemon</u>	<u>Tomato</u>	<u>Mango</u>
Sewner	56859	362	187	6530	11
Barud	87072	1189	588	2046	23
Morsi	73579	1046	476	3374	15
Tensa	30349	361	388	1405	15
Chandra Bazar	17500	241	344	1841	10
Karanja	24525	191	352	1742	15
Aste	25081	130	395	2494	12
Arve	19199	191	307	3007	10

Total During the discussion with the farmers, they assured that in case the unit is set up, they would supply their produce to the unit to save the botheration of going to mandi and to depend on the market forces for returns. They also indicated that they would expand the area under citrus crop so that the society would get all its requirement within a short distance. The annual requirement of oranges by the proposed unit is estimated upto 35,750 tonnes.

4.5 The area under lemon in Nagpur district is steadily increasing with the result that growers are experiencing marketing problems. The annual requirement of lemon by the proposed unit will be about 10400 tonnes, which can be produced without difficulty by the society.

4.6 The annual requirement of mango by the proposed unit would be around 6200 tonnes. Generally, Tothapuri, Neelam and Banganballi mangoes are largely processed followed by alphanso. All over the country, including the units in northern India, Tothapuri, and Banganpalli mangoes procured from Karnataka and Andhra Pradesh are being processed. These qualities are not sufficiently available in Nagpur. As such, the society will have to supplement availability of mangoes from the surrounding districts as well as from the neighbouring States of Karnataka and Andhra Pradesh. The lead distance is likely to vary from 600 to 800 Kms. Taking into account the cost of transportation, the procurement of mangoes from these places will be within the financial parameters of

Mango:

The estimated area under cultivation of mango in the state is as under;

Area and production of mango in Maharashtra

<u>District</u>	<u>Area (Acres)</u>	<u>Production (Lakh tonnes)</u>
Ratnagiri	5,37,000	10.74
Sindhudurg	1,42,100	2.84
Kolhapur	58,300	1.17
Sangli	8,600	0.17
Sholapur	6,200	0.12
Satara	34,800	0.70
Nagpur	60,000	1.20

the unit. In the initial stages, the society will have to get mangoes from these States, till production in the district increases.

4.7 Though, the precise data on production of tomato is not available, it is estimated that more than 60,000 tonnes are produced in the district. The tomato crop is a short duration one and start fruiting within 3 months. The growers usually take two crops in a year. It was also informed by the farmers that in case, the unit is set up, they would expand the area under their cultivation, so that there is no problem in the availability of tomato for the unit. At full capacity utilisation, the unit would require about 6400 tonnes of tomato. The farmers are ready to take up more area under tomato if there is a demand for processing.

4.8 Procurement Policy:

The main objective of the procurement policy would be to provide steady income to the farmers through forward looking procurement policy, which was inter-alia aim at increasing production of oranges, lemon and mango in the catchment area of the unit and also improving their quality so that the processing unit is assured of the continuous supply of raw material through out the year. The decisions emerging from the discussions with the members, co-op. officials and other concerned are as follows:

- (a) In the beginning of the season, the society will indicate its requirement of raw material in terms of citrus fruits, tomato and mango among the members. The members will be requested to earmark the specific production of raw material for processing by the unit.
- (b) The society would work out prices for raw material in consultation with the members, which are remunerative and financially viable to the unit.

- (c) The prices will be fixed by the Board of Directors of the society keeping in view the market trends. The society will pay the fixed price to the farmers on the spot. At the end of the season, when the accounts are settled, the society will also pay, in addition to the prices already paid, some portion of profits to the members.
- (d) The society will set up procurement centres in all areas, where substantial quantity of raw material is available. In other areas, the society will provide transportation to the farmers. It will chalk out route chart for lifting the raw materials from the procurement centres/farmers' field.

Chapter .V

Manufacturing/processing

Orange/lemon juice concentrate:

Oranges are sorted, washed and rinsed with clean water. It is then cut into half and juice is extracted. Before extraction of juice, the peel oil is extracted by pricking method. In the machines, seeds are automatically removed while extracting the juice. The juice is clarified and is concentrated in a multi-effect evaporator to obtain 65°- 70° brix. The entire process is continuous. The juice concentrate is further processed and packed aseptically in flexible packs of sizes 2-200 kg. depending upon the marketing demands.

Tomato paste

Fully ripe and red tomatoes are sorted, washed and rinsed with clear water, the stem of the tomato and field thrash are removed. The tomatoes are then crushed and passed through deseeder and further rendered into pulp. The pulp is heated to 85-95° C and processed through pulp refiners with varying mesh size to extract the juice. The juice is concentrated in multiple effect force circulation vacume evaporator to obtain 28° brix to mato paste. The entire process is continuous. The concentrated paste is further processed by sterilisation and aseptic packaging of 2-200 kgs. depending upon the marketing requirements.

Mango pulp :

Fully ripe mangoes are sorted and washed. Mangoes of large size are sliced and fed to the pulper. The first

- 13 -

effect of the evaporator is used to concentrate the mango pulp to about half the volume. The double strength pulp will follow the same processing as the tomato paste.

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Chapter VI

5.3 Organisation and management

The project will be implemented by the Vasantdada Sahakari Santra Prakriya Ltd., Narkhed established under the MSCS Act with the objects of providing better services to the growers for their produce and value addition for their increased production by way of establishing processing plant. The society will also have a very important task of providing backward linkages including farm guidances to the orange growers of the area. The overall management policies will be regulated by the Board of Directors. The Board of Directors will comprise of 14 including one Govt. nominee and one representative from State Co-op Bank. The MD of the society shall work as Member-Secretary of the Board.

The Chairman and the Vice-Chairman will be elected within the growers members. The bye-laws of the society will be framed in accordance with the State Co-op. societies Act. The management of the society will be handled through the departments :

- a) Personnel
- b) Accounts and Finance
- c) Procurement and inputs
- d) Processing, production and maintenance.
- e) Marketing.

The powers of the day-to-day management of project execution will be vested with the MD of the society, who will work as per the policies and directions given by the Board from time to time.

The organisational chart of the society will be as shown in the following chart. The *details* are as suggested at Annexure VII.

BOARD OF DIRECTORS

M. D.

	Manager (Finance & Accounts)	Manager (Inputs)	Manager (Marketing)	Manager (Production)
Personnel	Assistants(3)	Procurement Officer (1)	Sales Officer(2)	Technician (2) Plant Engineer(1)
Officer(1)	Welfare Officer (1)	Field Super- visors(10)	Sales Repre- sentatives (3)	Quality Cont. Officer(1) Plant Supervisor (3)
	Security Watchman(3)	Field Assis- tants(10)	Store Keeper(1)	Lab Asstt. (1) Electrical Foreman (4)
	Peon(3)			Operator (10)
				Boiler Attendant(2)
<u>Total : 71</u>				

The MD will be assisted by various officers as indicated below :

- (a) Manager (Personnel) will be in charge of the administration, unskilled labour and other matters relating to legal provisions and secretariat. He will directly work under the MD and appointments, transfers will be looked after by him.
- (b) Manager (Accounts & Finance) will be in charge of the Division and he will be assisted by A/c. Assits(3)

and one Cashier. This division will be responsible for arrangement of finance, banking, adjustment of sale realisation, cost accounting and maintenance of accounts.

(c) Manager (Inputs) will look after orange, tomato, Mango development programmes, which include increase in production, area, for credit facilities' liaison with various financing agencies. He will also coordinate input supply like fertiliser, pesticides, orange, plants, maintenance of nursery, training, demonstration, technical guidance, State Agri. Deptt. etc. He also will be responsible for development of co-op. relationship with farmer-members and increase in the membership of the society.

(d) Manager (Production): He will be in charge of processing plant. He will look after the maintenance, production schedule, utilisation of plant capacity, etc. He will keep liaison with Manager (Marketing, and Manager (Inputs) for procurement of raw materials and marketing of finished products.

The Manager will also be in charge of quality control of the product. He will keep watch on the similar products and other competitors in the market.

(e) Manager (Marketing) will be assisted by 2 sales officer and three sales Reps. One sales officer will provide market intelligence regarding arrival of fresh fruits, existing Price, feed back about consumer reaction, realisation and remittance of price proceeds at various intervals of times, rapport and business relationship with NAFED, NDDB and other business organisations. The other will be responsible for the marketing operations, sale of processed material locally and abroad .

Details of the organisation:

- Name of the society : Vasantdada Sahakari Santra(Orange)
Prekriya Karkhana Ltd., Narkhed,
District Nagpur(Maharashtra), India.
- Project site : Narkhed, Distt. Nagpur. Annex. VIII
- Area of the project : Three Hactares
- Area of operation : (a) Sauner & Kalmeshwar Taluka in
Nagpur District.
(b) Sarun, Raunsi, Chandia Bazar and
Teusa Taluka in Amravti District.
(c) Karanja, Asta and Arvi Taluka
in Vardha District.

Membership and Share Capital

	<u>No.</u>	<u>Share Capital</u>
(i) Orange Grower Member	459	Rs. 4,61,000.00
(Rs. 1000)		
(ii) Orange Grower Member	371	Rs. 94,750.00
(Rs. 250)		
(iii) Co-operative Societies	3	Rs. 2,03,000.00

833

Rs. 5,58,750.00

7,58,750.00

Production of Processed Fruits and Vegetables in India

<u>Year</u>	<u>Production in Tonnes</u>
1986-87	119840
87-88	140000
88-89	160000

Projected Demand for processed foods

<u>Product</u>	<u>1990</u>	<u>1995</u>	<u>Addl Requirement in next 5 years</u>	<u>Growth Rate</u>
Fruit juice Concentrate (T)	1244	3051	1827	20
Fruit juices (T)	6204	6618	414	1.3
Fruit Pulp (T)	4142	12340	8198	24.4
Squashes, Crush and Cordials (T)	10508	22647	12139	16.6
Fruit Syrups (T)	299	536	237	12.4
Nectars (T)	448	1096	648	19.6
Fruit Based Soft drinks (T)	73	132	59	12.6
Tomato Products (T)	7541	16890	9349	17.5
Soft drinks (T) (Millim Bottles)	2086	3032	937	7.7
Powder squashes (Ks. cones)	500	3800	3300	50
Jams (Bottles)	5091	7041	1950	6.7

Chapter-VII

Marketing of processed products:

7.1. Marketing of orange juice concentrate, mango pulp, tomato paste and lime juice concentrate of the proposed unit has certain distinctive features. These pulps and concentrates produced by the unit will be of high quality comparable to international standards. The orange juice concentrate will be 65-70° brix and no unit at present is producing this product in bulk aseptic packs. The mango pulp will be of double strength and there will be no comparison between the mango pulp produced by the proposed unit and manufactured by other private units in the country. The lime juice concentrate would also be produced in the country for the first time. These pulps and concentrates will be sold in 2-200 Kg. flexible packages depending upon the market requirements.

7.2. Orange juice concentrates will be used in the manufacture of orange juice, orange based beverages, orange squash, pharmaceuticals and baby feeds. The mango pulp will be used for soft drinks and juices. Tomato paste will find place in tomato sauce, soup, fast foods, etc., while lime juice concentrate will be used for manufacture of lemon based products and beverages & also souring material in various foods and curries. The marketing strategy of these products has been discussed below in the domestic and international markets.

7.3. Domestic Market:

In India, the demand for processed food products has shown an increasing trend during the last decade. Urbanisation and raising income and industrialisation has led to upsurge in the demand for processed food even from the lower and middle-class families, which due to paucity of time have started patronising processed food. Orange juice concentrate, tomato paste, mango pulp and lime juice concentrate, as inputs for fast food, would be finding ready market in the country.

7.4. Export Market:

International scene has also shifted in favour of processed fruit and vegetables. In fact, changing life style in India, has, to a large extent, been imported from foreign countries. The demand for orange juice concentrate and tomato paste has increased significantly in Europe, USA and other advanced countries, where as the mango pulp has found ready market in middle east countries where summer season is about 10 months in a year and the people in these countries find it convenient to take mango pulp based juices frequently. The lemon juice concentrate is in great demand in middle eastern european countries. There is also a possibility of buy-back arrangements to the extent of 75% of the total production by the suppliers of plant and machinery. However, the society's marketing strategy should be to first exploit domestic market to the fullest extent and then try for export market, particularly, the middle east and far east Asian countries.

7.5. The total production of orange juice concentrate would be 2,700 tonnes, which can be allocated as under:-

<u>Market</u>	<u>Quantity (MT)</u>
Export	500 18.5%
Domestic Buyers	1800 66.7%
Domestic normal channels	400 14.8%
	<u>2700</u>

For the domestic marketing, the society has to enter into negotiations with Parles', Union Bewaries, Modern Food Industries, etc. The society would also sell to hospitals, hotels and operators of juice vending machines throughout the country. In case of normal channels, the society will be selling through the stockists after negotiations.

7.6. Approximate quantity to be manufactured in different packagings, rate per tonne and sale realisation at ex-factory prices are given in the following table:-

<u>Item</u>	<u>Packing</u>	<u>Quantity (tonnes)</u>	<u>Rate (rs./T)</u>	<u>Amount (rs. in lakhs)</u>
Orange concentrate	2 Kg	20	46,000	9.20
-do	25 Kg	1000	40,000	400 .00
-do	200 Kg	1680	35,000	588.00
Lemon juice concentrate	25 Kg	300	42,000	126.00
-do-	200 Kg	510	37,500	191.25

7.7. Mango Pulp

In case of mango pulp, the society would be manufacturing double strength mango pulp, which would reduce the packaging and transportation cost to half as 1/2 Kg. of double strength pulp would be equivalent to 1 Kg. of normal mango pulp. The society proposes to manufacture 2200 tonnes of mango pulp at full capacity. In case of mango pulp the market strategy will be to sell in the export to the maximum extent and rest will be offered to the bulk consumers in the country. There is no provision for marketing of mango pulp through normal channels. The society proposes to explore the possibility of an agreement with the machinery supplier for buy-back guarantee to import about 75% of mango pulp produced during the year. In case of buy-back guarantee prices will be fixed with reference to prevailing prices in the international market.

The unit will supply mango pulp to the fruit drink manufacturers in the country, like Parle Group of industries, Atash Industries, United bewaries group and

other units like Modern Food Industries. The Parle Group has captured 50-60% market of soft drinks in the country, which is growing at an increasing rate.

Approximate ex-factory prices of mango pulp packed in different sizes would be as follows:-

<u>Item</u>	<u>Packing</u>	<u>Quantity (Tonnes)</u>	<u>Rate (Rs./T)</u>	<u>Amount (Rs. in lakhs)</u>
Mango pulp	25 Kg.	600	20,000	120.00
-do-	200 Kg.	1000	17,000	170.00

7.8. Tomato Paste:

In case of tomato paste, the society's marketing strategy will be to exploit the domestic market to the full extent and take up to exports only, when it get remunerative price. This is owing to tough competition from other countries in international market. The total production of tomato paste would be about 900 tonnes. This can be allocated as under:-

<u>Item</u>	<u>Packing</u>	<u>Qty (Tonnes)</u>	<u>Rate (Rs./T)</u>	<u>Amount (in lakhs)</u>
Tomato paste	2Kg.	50	16,000	8.00
-do-	200Kg.	850	13,000	110.50

In domestic market, the society has to tie up to marketing with M/s. Akbar Aly's and manufacturer of tomato products and fast foods.

Export of Processed Fruit & Vegetable products from India

<u>Year</u>	<u>Quantity</u>	<u>Value in Rs. (Lakhs)</u>
1985-86	38,351	3698
86-87	61,300	5768
87-88	70,538	6520

Export of Mango Pulp.

Quantity in Tonnes
Value in Rs. Lakhs

<u>Destination</u>	1985-86		86-87		87-88	
	<u>Quantity</u>	<u>value</u>	<u>quantity</u>	<u>value</u>	<u>quantity</u>	<u>value</u>
Africa	80	8	64	6	54	5
Eastern Europe	1143	90	5471	431	NA	
Far East	134	17	221	30	70	9
Middle East	7358	710	11053	1019	16211	1548
<u>North America</u>	371	60	424	62	371	54
Western Europe	897	110	1766	223	1112	136

CHAPTER -VIII

Project Cost

The details of the Project costs are as follows:

	<u>(Rs. in lakhs)</u>	
Land & development	5.35	
Civil works	46.55	
Plant & machinery:		
Imported	460.00	
Indigenous	59.10	519.10
Pre-operative expenses	106.00	
Margin money	150.00	
Consultancy & contingencies	40.00	
Total	867.00	
Training & Coop. Dev. Services	23.50	
Total	890.50	

890.50
460.00

430.50

The society has located a site at Nrakhed in Nagpur district about half km. away from the fruit market. The site was visited and found to be suitable for the said project. It was reported that the land is available on lease (99 years) from the trust, to whom the land belong to. Hence, there is no need to purchase the land on out-right basis. The society will incur an expenditure of Rs.5.35 lakhs for development of site and other facilities as under:

3 Hectares
7.5 Acres

	<u>(Rs. in lakhs)</u>
i) Cost of levelling	0.35
ii) Cost of approach roads	2.50
iii) Fencing	2.00
iv) Others	0.50
	<u>5.35</u>

A) The expenditure on civil works for the factory building and also the cost for cold storage is estimated at Rs. 46.55 lakhs.

B) The so-ciety has to import a complete plant for manufacture of juice concentrate and aseptic packagin which is not available indogeneously. The Indian agents with the help of the members abroad have quoted Rs. 460 lakhs for this plant.

C) The indogeneous machinery required along with the other fixed assets works out to Rs. 59.10 lakhs. The details of the cost of indogeneous machinery are as under :-

	<u>(Rs. in lakhs)</u>
<u>Indogeneous Equipments</u>	
i) Electricals incl. transformer	7.30
ii) Steam generators complete	13.50
iii) Refrigeration system complete	12.00
iv) Water distribution system	2.50
v) Compressed air system	0.70

(Rs. in lakhs)

Indigenous Equipments (contd.)

vi) Office furniture & fixtures	1.50
vii) Transport vehicles	6.00
viii) Other fixed assets	10.60
ix) Effluent disposal	5.00

59.10

Pre Operative expenses :

The requirement of pre-operative expenses will be as follows :-

(Rs. in lakhs)

Establishment	2.00
Rent. rates & taxes	0.50
Admn. Expenses	3.50
Interest on loan	60.00
Promotional & Adv. expenses	40.00

106.00

E) Margin money for working capital

The raw materials for this project is perishable in nature and no bank gives any margin on this. Similarly, the expenditure to be incurred on salary, wages, establishment and utility, etc. will also not be provided by Banks. On this basis, the requirement of margin money works out to Rs. 150 lakhs. The details are given in para 11 of Annexure.

F) Training and Co-op. Dev. Services:

For the proposed project, there would a need to have trained manpower both at the farm level as well as at the factory level. Extension services are also important for increasing yield and production of fruits. A provision of Rs. 23.50 lakhs for this purpose has been made. It is suggested that this amount may be provided to the society

as subsidy. The society should in consultation with the Scientists from Horticultural Research Instt. try to motivate farmer members to propagate new varieties of tomato and citrus, which may contain high total Soluble Solids. This will greatly help the society in reducing the cost of production on account of less requirement of raw materials as also less energy consumption to achieve the desired level of concentration. Towards the requirement of funds for investment on various devises to demonstrate the use of technical equipments to improve the production, as also to take care of recurring expenditure of 5 years, an amount of Rs. 23.50 lakhs is provided. The details are as follows :-

The details are given below :-

Coop. Dev. Services & Training

Investments

	No.	Cost (Rs. in lakhs)
Motor cycles	4	1.00
Projector /video set	1	0.50
Photocopying machine	1	0.30
Office furniture	2 sets	0.30
Typewriters	2	0.15
Demonstration equipments (Sprayers, etc.)	25 sets	0.50
		<u>2.75</u>

Recurring expenses : 5 years

Salaries

Agri. Extn. Officer	1	@ Rs. 3500/- P.M.
Supervisors	4	@ Rs. 2000/- P.M.
Assistants	4	@ Rs. 1500/- P.M.
Steno typist	1	@ Rs. 1500/- P.M.
Attendent	1	@ Rs. 800/- P.M.

Annual Salaries 2.75 lakhs

Salaries for 5 years .13.75 lakhs

Estt. & Maintenance (fuel, stationery, teaching, materials etc)

.. Rs. 1.40 per annum

<u>Total expenses</u>	<u>(Rs. in lakhs)</u>
Investment	2.75
Salaries	13.75
Others	7.00
	<u>23.50</u>

It is proposed that this amount should be given to the society as a subsidy so that during the first 5 years the society would be in a position to take care of the extension work. This subsidy may be shared between the State Government and NCDC on 50:50 basis.

CHAPTER IX

Financial analysis

Q.1 Source of Finance:

The total initial outlay has been estimated at Rs.867 lakhs. As per the pattern of assistance of NCDC, 70% of the Project cost is given in the form of loan and the remaining 30% as share capital to be shared between the society and the State Govt. in the ratio of 1:3. Besides, I am of the opinion that the society would need a subsidy of 23.5 lakhs to take care of the extension activities which should be shared between the State Govt. and NCDC on 50:50 basis. Keeping in view these points, the source of finance for this project will be as follows:-

<u>FROM NCDC TO STATES GOVT.</u>	(Rs. in lakhs)
Loan (70% of the project cost of Rs.867 lakhs)	606.90
Subsidy (50% of Rs.23.50 lakhs)	11.75
	<hr/> 618.65 <hr/>
 <u>STATE GOVT. TO SOCIETY:</u>	
Loan (70% of the project cost)	606.90
Share capital (22.5%)	195.08
Subsidy	23.50
	<hr/> 825.48 <hr/>
 Society's contribution	 65.02
Total	<hr/> 890.50 <hr/>

Break-even analysis:

Q.2 While estimating profitability, it has been assumed that the unit would utilise citrus and non-citrus fruits for concentration. Even though the major product would be orange concentrate, the unit would also manufacture lemon juice concentrate, tomato paste and mango pulp during the off season of oranges. It is assumed that the unit will operate for 284 days on 3 shifts basis. However, while calculating the financial

viability, it is assumed that the unit will utilise 30% capacity during the first year. The various assumptions taken while working out the profitability are given in Annexure-I.

The break-even analysis has been given in Annexure-II. From the statement, it could be seen that the unit breaks-even at 50.4% capacity utilisation. The cash break-even works out to 36.6%.

Profitability:

9.3 The statement at Annexure-III gives details of the fixed costs for the each 15 ~~xxx~~ years of operation while statement at Annexure-IV indicates the profit before tax, profit after tax and cash inflow for 15 years of operation of the unit. It would be seen from the statement that the income after tax would continuously increase from Rs.28.47 lakhs in third year to Rs.144 lakhs in the 15th year of operation.

9.4 DEBT SERVICE COVERAGE RATIO:

The Debt Service Coverage Ratio is given in the statement at Annexure-V. The Unit has high ratio during the repayment period on the block loan, except during the first year. The ratio varies from 1.18 in the second year to 2.58 in the 14th year. The Unit will generate sufficient surplus to service its financial obligations, in terms of principal and interest during the repayment period.

9.5 PAY-BACK PERIOD:

The pay-back period calculations are given in the Annexure VI. It is observed that the pay back period of the unit is six years which is fairly satisfactory for such type of projects.

9.6 WORKING CAPITAL REQUIREMENT:

The margin money and working capital requirements are given in para 11 of Annexure-I. It may be seen that the total working capital requirement would be about Rs.351.63 lakhs and the margin money requirement would be around Rs.150 lakhs.

9.7 INTERNAL RATE OF RETURN:

The IRR for the unit has been calculated on Discounted Method and is given in Annexure VI. The Internal rate of return works out to be 16% which is satisfactory for such type of project.

9.8 SENSITIVITY ANALYSIS:

9.8 SENSITIVITY ANALYSIS:

In profitability projections, raw material and the finished goods prices are assumed same as prevailing presently. However, they may vary independent of each other which will affect the profitability of the unit. It may be seen that the project is sensitive to these prices. An increase in raw material price by 5% change the B.E.P. to 57.6% from 50.4%. An increase in finished goods by 5%, change the Pay back period to 5 years 6 months from 6 years, NPV to 1.30 from 1.06 and BCR to 269.66 from 55.06. Annex. VI A.

Chapter X
Recommendations

10.1. Keeping in view the growth of orange, lemon, tomato and mango plantation in the project area, it is inevitable to establish a processing plant.

10.2. The State Co-operative Bank and other financial institutions should come forward to provide long-term loan for setting up of processing plant.

10.3. Agriculture Department and Agriculture University should take up research programmes to provide latest technology to the growers in the area.

10.4. State Govt. should also provide its proposed share of equity and subsidy for the processing unit.

10.5. The society should capture the maximum share of orange produce to run the plant at full capacity and also try to increase the yield per acre.

10.6. The society should appoint the best available managerial and technical personnel for management of processing unit. The society should recruit its own employees, so that they can feel that it is their own organisation.

In the light of the facts, arguments and operational economics of the unit mentioned earlier, it is found that the project is technically feasible and economically viable.

ASSUMPTIONS OF VARIOUS COSTS

In the estimation of profitability for the next 15 years, the economic life of the project, the following assumptions have been made:

1. Capacity utilisation:

1st Year	-	30%
2nd Year	-	40%
3rd Year	-	55%
4th Year	-	75%
5th Year	-	80%

2. Working Days :

The unit would operate for 284 days in a year on 3 shift basis. It will operate 169 days on orange, 52 days on Lemon, 32 days on Tomato and 31 days on mango.

3. Raw Materials:

a) The installed capacity of the unit is to process 200 tonne raw material per day as such the annual raw material requirement would be as under:

		<u>Tonnes</u>
Orange	-	33,800
Lemon	-	10,400
Tomato	-	6,400
Mango	-	6,200

b) The raw material cost FOR factory has been assumed as under:

<u>Item</u>	<u>Quantity (tonnes)</u>	<u>Rate/tonne</u>	<u>Amount (Rs. in lakhs)</u>
Orange	33,800	Rs.2,100	709.00
Lemon	10,400	Rs.2,100	218.40
Tomato	6,400	Rs.1,200	76.80
Mango	6,200	Rs.2,500	155.00
	<u>56,800</u>		<u>1159.20</u>

...2/-

The total cost of raw material would be Rs.1159.20 lakhs.

4. Packing Materials:

a) The unit will pack concentrates and pulps in flexible aseptic bags which will have to be imported for the present. Different capacity bags such as 2 kg., 25 kg. and 200 kg. would be used. The cost of packaging material on the basis of prevailing international price has been worked out below:-

<u>Capacity of aseptic bags</u>	<u>Quantity to be packed(tonnes)</u>	<u>No. of bags required</u>	<u>Cost per unit(Rs.)</u>	<u>Amount (Rs.in lakhs)</u>
2 Kg.	70	35,000	7.00	2.45
25 Kg.	1900	76,000	45.00	34.20
200 Kg.	4070	20,350	160.00	32.56
				69.21

b) The bags of 2 kg. & 25 kg. capacity will be further packed in corrugated boxes while 200 kg. bags will be placed in drums to avoid any damage during storage and transport. The requirement of secondary packing materials would be as under:-

<u>Size of aseptic bags</u>	<u>No. of bags</u>	<u>Quantity of boxes/drums required</u>	<u>unit Cost (Rs.)</u>	<u>Amount (Rs.in lakhs)</u>
2	35,000	3,500	7.00	0.25
25	76,000	76,000	11.00	8.36
200	20,350	20,350	160.00	32.56
				41.17

Cost of secondary packing would be Rs.41.17 lakhs.

The total cost of packing material would be Rs.110.38 lakhs

5. Wages :

The unit will require casual workers for loading, unloading, sorting, handling and packing operations.

On an average it will require 80 workers - 20 male and 60 female, per shift. The prevailing wage structure is Rs.15 per day for male workers and Rs.12 for female worker. Thus the total wage bill for 284 days working on 3 shifts basis would be Rs.8.69 lakhs.

6. Utili-ties:

The total power requirement of the unit has been estimated at about 450 KVA. The demand charges @ Rs.288 per KVA would be Rs.1.30 lakhs. The plant is likely to consume 17.89 lakhs units annually as such the cost at the prevailing rate of Rs.0.80 per KWH would be around Rs.14.31 lakhs.

The boiler will consume about 8 lakh litre of furnace oil per annum. Its cost @ Rs.4.30 per litre would be Rs.34.40 lakhs.

For water the society would dug bore wells and its operating cost is included in power cost.

The total expenses on utilities would be Rs.50.01 lakhs.

7. Interest :

Interest has been calculated @ 13.25% per annum on 70% of the total block cost of Rs.867 lakhs. This would work out to Rs.80.41 lakhs.

Interest on working capital loan has been assumed @ 18% which would be around Rs.36.29 lakhs per annum.

8. Establishment :

The unit will require a number of personnels to look after various activities, The details are given in Annex VII. The annual salary bill would be about Rs.17.15 lakhs,

9. Depriciation :

Depriciation has been calculated at the following Rate:

Buildings & civil works	:	5%	46.55
Machinery & Equipment	:	10%	517.10
Fixtures and fittings	:	10%	
Vehicles	:	20%	

The total deprication shall work out to Rs.54.58 lakhs per annum.

10. Sales realisation :

a) The unit will pack concentrates and pulps in different packs. The ex-factory sales revenue has been computed as under:

Item	Packing	Quantity tonnes	Rate Rs./tonne	Amount (Rs. in lakhs)
1. Orange Concentrate	2 kg.	20	46000	9.20
2. -do-	25 kg.	1000	40000	400.00
3. -do-	200 kg.	1680	35000	588.00
4. Lemon Concentrate	25 kg.	300	42000	126.00
5. -do-	200 kg.	510	37500	191.25
6. Mango Pulp (double strength)	25 kg.	600	20000	120.00
7. -do-	200 kg.	1000	17000	170.00
8. Tomato Paste	2 kg.	50	16000	8.00
9. -do-	200 kg.	850	13000	110.50
				1722.95
				...5/-

b) Revenue from sale of by-products is likely to be as under:-

<u>Item</u>	<u>Quantity (tonnes)</u>	<u>Rate Rs/tonne</u>	<u>Amount (Rs. in lakhs)</u>
1. Essential oil (orange)	40.5	70,000	28.35
2. Peel oil(orange)	54	40,000	21.60
3. Essential oil (Lemon)	10	75,000	7.50
4. Peel oil(Lemon)	13.5	70,000	9.45
5. Tomato seeds	32	4,000	1.28
6. Mango seeds	850	2,000	17.00
7. Citrus seeds	34	3,000	1.02
8. Dry citrus peel	3000	1,000	30.00

} 116.20

The total sales revenue would be Rs.1839,15 lakhs.

11. Margin money :

The raw materials, being perishable no bank extend any margin on these. Similarly the expenses to be incurred on salaries, wages, utilities & establishment will also be required in full. Keeping this in view the requirement of margin money has been worked out as under:-

<u>Item</u>	<u>Period (months)</u>	<u>Working Capital Amount</u>	<u>Bank Margin</u>	<u>(Rs. in lakhs) Margin money required</u>
Raw Materials	1/2	61.22	-	61.22
Packing materials & consumable stores	2	23.32	25%	5.84
Wages & Salaries	2	5.44	-	5.44
Utilities	2	10.56	-	10.56
Finished goods	1 1/2	245.50	25%	61.38
Other items of working capital	1	5.59	-	5.59
		<u>351.63</u>		<u>150.00</u>

BREAK-EVEN ANALYSIS

A. <u>VARIABLE COSTS:</u>		(Rs. in lakhs)
Raw Materials		1159.20
Packing Materials		110.38
Wages		8.69
Utilities		50.01
Chemicals		3.00
Interest on working capital		36.29
Contingencies		5.00
	Total:	<u>1372.57</u>
B. <u>SALES REVENUE :</u>		
Orange concentrate		997.20
Lemon concentrate		317.25
Mango pulp		290.00
Tomato Paste		118.50
By-products		116.20
		<u>1839.15</u>
C. <u>CONTRIBUTION :</u>		
Contribution towards		
overheads	:	466.58
(B - A)		

D. FIXED COSTS :

Establishment	17.15
Office expenses & over heads	10.00
Interest on loan	80.41
Depriciation	54.58
Rent - Taxes - Insurance	3.00
Spares, Maintenance & Repairs	10.00
Pre-operative expenses	10.00
Sales promotion	40.00
Miscellenous expenses	10.00
	<hr/>
	235.14
	<hr/>

E. Break-even point:

$$\left(\frac{D}{C} \times 100 \right) : \frac{235.14 \times 100}{466.58} = 50.4\%$$

$$\text{Cash Break-even} : \frac{(235.14 - 64.58) \times 100}{466.55} = 36.6\%$$

Annexure III

Fixed Costs

Year	Rs in lakhs														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Establishment & O.H.	27.13	28.51	29.93	31.43	33.00	34.65	36.38	38.20	40.11	42.11	44.22	46.44	48.76	51.19	53.76
2. Depreciation	54.58	49.12	44.21	39.79	35.81	32.23	29.00	26.11	23.49	21.15	19.03	17.13	15.42	13.87	12.49
3. Interest on loan	80.41	80.41	80.41	80.41	73.10	65.79	58.48	51.17	43.86	36.48	29.24	21.93	14.62	7.31	-
4. Maintenance	10.00	10.00	10.00	11.00	11.00	11.00	12.00	12.00	12.00	13.00	13.00	13.00	14.00	14.00	14.00
5. Rates-Rent Insurance	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6. Sales promotion & Miscs.	60.60	60.60	60.60	60.60	60.60	60.60	60.60	60.60	60.60	60.60	50.00	50.00	50.00	50.00	50.00
7. Total fixed Costs	235.74	231.64	228.15	226.15	276.51	207.27	199.46	191.08	188.06	176.30	158.49	151.50	145.80	139.37	133.25

3

13565

2713
1.51
28.48

ANNEX-IV

(Rs. in lakhs)

Profitability Statement :

Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Capacity utilisation	30	40	55	75	80	80	80	80	80	80	80	80	80	80	80
2. Production (tonnes)	1803	2404	3306	4508	4808	4808	4808	4808	4808	4808	4808	4808	4808	4808	4808
3. Sales Revenue	551.75	735.66	1011.53	1379.36	1471.32	1471.32	1471.32	1471.32	1471.32	1471.32	1471.32	1471.32	1471.32	1471.32	1471.32
4. Variable costs	411.77	549.03	754.91	1029.43	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06
5. Contribution over heads	139.98	186.63	256.62	349.93	373.26	373.26	373.26	373.26	373.26	373.26	373.26	373.26	373.26	373.26	373.26
6. Fixed costs	235.74	231.64	228.15	226.15	216.51	207.27	199.46	191.08	183.06	176.30	158.49	151.50	145.80	139.37	133.25
7. Profit before tax	95.76	(-)45.01	28.47	123.78	156.75	165.99	173.80	182.18	190.20	196.96	214.17	221.76	227.46	233.89	240.01
8. Tax	-	-	-	4.59	62.70	66.40	69.52	72.87	76.08	78.78	85.91	88.70	90.98	93.56	96.00
9. Profit after tax	(-) 95.76	(-)45.01	28.47	119.19	94.05	99.59	104.28	109.31	114.12	118.18	128.86	133.06	136.48	140.33	144.01
10. Depreciation	54.58	49.12	44.22	39.79	35.81	32.23	29.00	26.11	23.49	21.15	19.03	17.13	15.42	13.87	12.49
11. Cash in flow	(-) 41.18	4.11	72.69	158.98	129.86	131.82	133.28	135.42	137.61	139.33	147.89	150.19	151.90	154.20	156.50

PROFITABILITY STATEMENT (5% increase in sale revenue)

Annexure IVA

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Year															
1. % Capacity utilisation	30	40	55	75	80	80	80	80	80	80	80	80	80	80	80
2. Production (Tonnes)	1803	2404	3306	4506	4808	4808	4808	4808	4808	4808	4808	4808	4808	4808	4808
3. Sales revenue	579.34	772.44	1062.11	1448.33	1544.89	1544.89	1544.89	1544.89	1544.89	1544.89	1544.89	1544.89	1544.89	1544.89	1544.99
4. Variable costs	411.77	549.03	754.91	1029.43	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06	1098.06
5. Contribution to overheads	167.57	223.41	307.20	418.90	446.83	446.83	446.83	446.83	446.83	446.83	446.83	446.83	446.83	446.83	446.83
6. Fixed Costs	235.74	231.64	228.15	226.15	216.51	207.27	199.46	191.08	183.06	176.30	158.49	151.50	154.80	139.37	133.25
7. Profit before tax	-68.17	-7.83	79.05	192.75	230.32	239.56	247.37	255.75	263.77	270.53	288.34	295.33	301.03	307.46	313.58
8. Tax @ 40%	-	-	1.20	77.10	92.13	95.82	98.82	102.30	105.51	108.21	115.34	118.13	120.41	122.98	125.43
9. Profit after tax	-68.17	-7.83	77.85	115.65	138.19	143.74	148.42	152.45	158.26	162.32	173.00	177.20	180.62	184.48	188.15
10. Depreciation	54.58	49.12	44.22	39.79	35.81	32.23	29.00	26.11	23.49	21.15	19.03	17.13	15.42	13.87	12.49
11. Cash in flow	-41.18	4.11	72.69	158.98	129.86	131.82	133.28	135.42	187.61	139.83	147.89	150.12	151.19	154.20	156.50

Rs in lakhs

ANNEX-V

DEBT SERVICE COVERAGE RATIO

(... In Lakhs)

YEARS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Profit after Tax	(-)95.76	(-)45.01	28.47	119.19	94.05	99.59	104.28	109.31	114.12	116.18	128.86	133.06	136.48	140.33	144.01
2. Depreciation	54.58	45.12	44.21	39.79	35.81	32.23	29.00	26.11	23.49	21.15	19.03	17.13	15.42	13.87	12.49
3. Pre-operation expenses	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	-	-	-	-	-
4. Interest on block loan	80.41	80.41	80.41	80.41	73.10	65.79	58.48	51.17	43.86	36.48	29.24	21.93	14.62	7.31	-
5. Net Cash Inflow	49.83	95.12	163.69	249.99	213.56	208.21	202.36	197.19	192.07	166.41	177.17	172.12	165.52	161.51	156.50
6. Loan installment	-	-	-	55.17	55.17	55.17	55.17	55.17	55.17	55.17	55.17	55.17	55.17	55.20	-
7. Interest on block loan	80.41	80.41	80.41	80.41	73.10	65.79	58.48	51.17	43.86	36.48	29.24	21.93	14.62	7.31	-
8. Total outflow	80.41	80.41	80.41	135.58	130.27	120.96	113.65	106.34	99.83	91.65	84.41	77.10	70.79	62.48	-
9. Debt Service Coverage Ratio	0.62	1.18	2.04	1.84	1.66	1.72	1.78	1.85	1.94	2.03	2.10	2.23	2.39	2.50	-

-95.76
 54.58
 10.60
 80.41

145.59
 95.76
 69.83

80.41
 80.41
 80.41
 135.58
 130.27
 120.96
 113.65
 106.34
 99.83
 91.65
 84.41
 77.10
 70.79
 62.48

COMPUTATIONS FOR MEASURES OF INVESTMENT WORTH

ANNEXURE - VI

(Rs. in Lakhs)

Item	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1. Profit after tax		75.76	45.71	28.47	119.19	94.05	99.59	104.28	109.31	114.12	118.18	123.86	133.06	136.48	140.33	144.01	
2. Depreciation		84.58	49.12	44.22	39.79	35.81	32.23	29.00	26.11	23.49	21.18	19.03	17.13	15.42	13.87	12.49	433.64
3. Interest on term loan		80.41	80.41	80.41	80.41	73.90	65.79	58.44	51.77	45.86	36.48	29.24	21.93	14.82	7.31	0	457.10
4. Salvage value																	
5. Profit before Depreciation and interest on term loan and after tax, including Salvage value (1+2-3+4)		39.23	84.52	153.80	239.39	202.96	197.81	191.76	186.59	181.47	175.81	177.93	172.12	166.82	161.51	157.60	
6. Cumulative sum of (5)		39.23	123.75	276.85	516.24	719.20	916.81										
7. Discount factor @10%		0.8694	0.7561	0.6575	0.5718	0.4972	0.4323	0.3759	0.3269	0.2843	0.2472	0.2149	0.1869	0.1625	0.1413	0.1228	
8. Discounted Value of net cash inflows @10%		34.11	63.41	100.66	136.88	100.11	85.43	72.08	61.00	51.59	43.46	38.07	32.17	27.09	22.82	19.41	345.56
9. Capital expenditure	890.5																
10. Pay-back = 8 years																	
11. NPV @10%	945.57	-	-	890.50	-	85.06											
12. ICR @10%	249.56					1.06											
13. Discount factor @10%	0.8475	0.7402	0.6386	0.5418	0.4510	0.3711	0.3004	0.2359	0.1860	0.1419	0.1011	0.0719	0.0512	0.0363	0.0260	0.0185	
14. Discounted Value @10%	32.26	60.70	93.18	123.40	88.74	73.19	60.19	49.63	40.92	33.60	28.68	23.61	19.37	15.91	11.24	7.95	
15. NPV @10%	746.66	-	890.50	-	84.84												

$$IRR = 10 - \left[\frac{94.84}{50.08 + 94.84} \right] \times 10 = 9.12\%$$

$$= 10 - \left[\frac{94.84}{46.03} \right] \times 10 = 7.95\%$$

$$= 10 - 2.03 = 7.97\%$$

$$= 10 - 2.03 = 7.97\%$$

Handwritten signature and initials.

COMPUTATIONS FOR MEASURES OF INVESTMENT WORTH

Annexure VI-A
Rs. in lakhs

Item	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1. Profit after tax		-68.17	77.85	115.65	138.19	143.74	148.42	152.45	158.26	162.32	173.00	177.20	180.62	184.48	188.15		
2. Depreciation		54.58	49.12	44.22	39.79	35.81	32.23	29.00	26.11	23.45	21.15	19.03	17.13	15.42	13.87	12.49	433.44
3. Interest on term loan		80.41	80.41	80.41	80.41	73.10	65.79	58.48	51.17	43.86	36.48	29.24	21.93	14.52	7.31	0	
4. Salvage value																	451.10
5. Profit before depreciation and interest on term loan and after tax, including salvage value (1+2+3+4)		66.82	121.70	202.48	235.85	247.10	241.76	235.90	230.79	225.61	219.95	221.27	216.26	210.66	205.66	200.66	651.74
6. Cumulative sum of (5)		66.82	188.52	391.00	626.85	873.95	1071.56										
7. Discount factor @ 15%		.8596	.7561	.6575	.5718	.4972	.4323	.3759	.3269	.2843	.2472	.2149	.1869	.1625	.1413	.1229	
@ 18%		.8495	.7182	.6086	.5158	.4391	.3704	.3139	.2660	.2255	.1911	.1619	.1392	.1163	.0985	.0835	
9. Discounted value of net cash inflow @ 15% (5 x 7 = 8)		58.11	92.02	133.13	134.86	122.86	104.51	88.67	75.43	64.14	54.33	47.55	40.42	34.23	29.06	24.50	80.84
@ 18%		58.63	81.40	123.23	121.65	108.01	89.55	74.05	61.39	50.88	42.03	35.82	29.67	24.50	20.26	16.42	979.49
9. Capital expenditure 890.5																	
10. Payback - 6 years & 6 months																	
1. NPV @ 15%																	269.66
2. BCR @ 15%																	88.99
3. Discount factor @ 15%																	
4. Discount value @ 15%																	18 + 1.48 = 19.48
5. NPV @ 18%																	269.66 - 88.99 = 180.67

IRR = 18% + $\frac{1160.16 - 979.49}{18 - 15}$

NPV @ 15% = 269.66

NPV @ 18% = 979.49 - 890.5 = 88.99

IRR = 18% + $\frac{88.99}{269.66 - 88.99}$ = 18 + 1.48 = 19.48

Annex-VII

ORGANISATIONAL SET UP OF THE PROPOSED UNIT

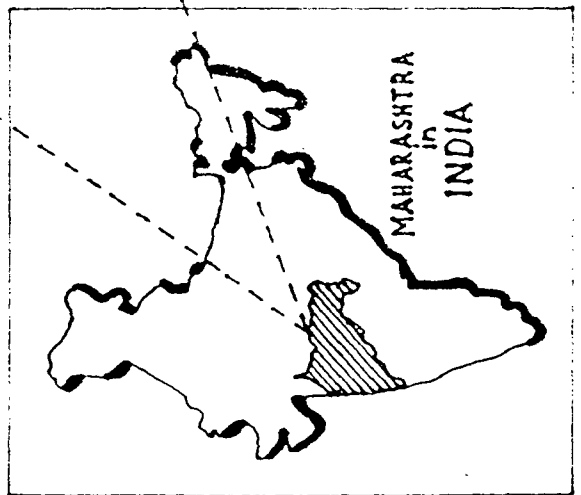
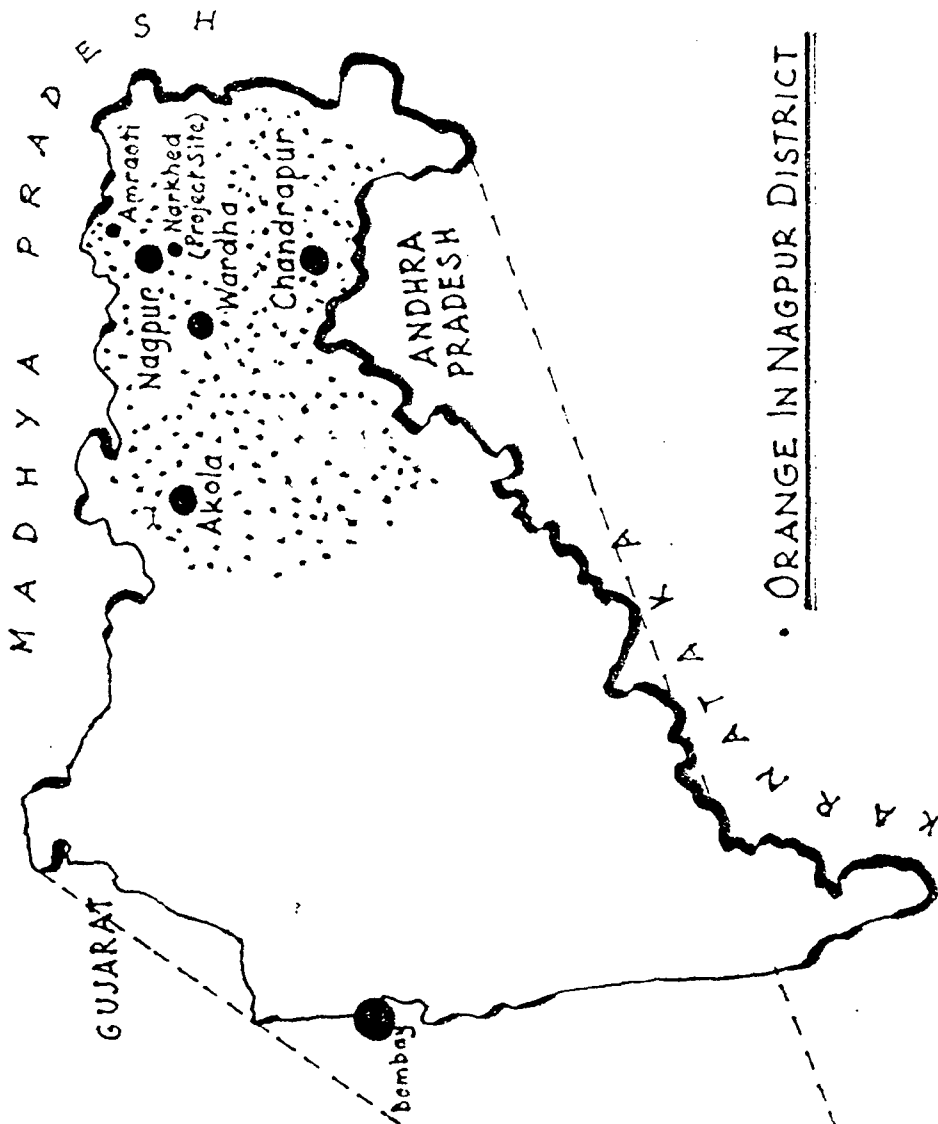
<u>S.No.</u>	<u>Name of the post</u>	<u>No.</u>	<u>Annual emoluments (Rs. in lakhs)</u>
1.	Managing Director	1	0.60
2.	Managing (Production)	1	0.42
3.	Fruit Technologist	2	0.60
4.	Quality Control Officer	1	0.30
5.	Plant Supervisor	3	0.54
6.	Laboratory Assistant	1	0.18
7.	Plant Engineer	1	0.36
8.	Electrician/Foreman	4	0.60
9.	Boiler Attendant	2	0.36
10.	Operators	10	1.20
11.	Manager (Marketing)	1	0.42
12.	Sales Officer	2	0.60
13.	Sales Representatives	3	0.65
14.	Manager (Procurement & Inputs)	1	0.42
15.	Procurement Officer	1	0.30
16.	Field Supervisors	10	1.80
17.	Field Assistants (Collection Centres)	10	1.20
18.	Personnel Officer	1	0.36
19.	Welfare Officer	1	0.30
20.	Accounts Officer	1	0.30
21.	Accounts Clerks	3	0.54
22.	Cashier	1	0.18
23.	Store Keeper	1	0.24
24.	Assistants	3	0.54
25.	Security Watchmen	3	0.36
26.	Peons	3	0.29
		71	13.72

Misc. benefits (approx. 3 months salary)

3.43

Total

17.15



Fruit Processing Unit at Narkhed, Nagpur.

Operational Plan.

S.N.	Activity	No. of Months.
1.	Project Report.	3 Months. FROM MAY 91.
2.	Loan Formalities.	4 Months. June to September
3.	Land development.	1 Month. October 91.
4.	Negotiation Plant & Machinery	2 Month October to Nov
5.	Construction of Building	6 Months. October to March 9
6.	Acquiring of Plant & Machinery	3 Months. April to June 92
7.	Construction of Cold Storage	3 Months. July to September
8.	Power, water etc.	2 Months August & September 9
9.	Installation of Plant & Mech.	2 month August & September
10.	Test Run.	1 October 92
11.	Total Completion	One & half years. 18 months.

Note: Entire process will depend on availability of Finance.

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: Cotton Processing and Marketing
<i>COUNTRY</i>	: India
<i>PROJECT PREPARED BY</i>	: Raj Pal Gaba

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

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ACKNOWLEDGEMENT

The 5th ICA/Japan Training Course for strengthening Management of Agricultural Co-operatives in Asia organised by I.C.A. has provided me with an opportunity to understand about the modern management system of Agricultural Co-operatives and techniques of formulation and implementation of Project for Integrated Agricultural Co-operatives. It has given me an opportunity to understand various aspects of working of Agricultural Co-operatives in South-East Asian countries with the objective of increasing the farmers' income as well as understanding their agricultural situations and management problems.

The Sanawad cotton processing and marketing project has been prepared in accomplishment of the training programme. The conceptual inputs given by the Course Director Sh. M.V. Madane and the course faculty from Indian Institute of Management, Ahmedabad has been liberally used while preparing this project and for which they owe may special gratitude.

Sh. S.S. Dawra, M.D. Nafed has motivated me to undertake this project. He has also provided necessary facilities for finalising this report. I convey my sincere gratitude to him. I am also thankful to Shri K. Jankiram, Executive Director, NAFED and Shri Pramod Pandey, Manager, NAFED who have very kindly guided me practically at every step of preparation of this project report. My sincere thanks are also due to Shri Tara Chand Patel, Chairman of the Sanawad Cooperative Marketing Society Ltd. with whose cooperation it has been possible to frame the Project.

I am thankful to members of the Faculty of Indian Institute of Management, Ahmedabad, specially Prof. G.S. Gupta and Prof. A.H. Kalro who have very kindly gone through the manuscript of entire project report and made most invaluable suggestions regarding viability and implementability of the Project. I also grateful to shri S.C. Sondhi Manager, NAFED for his over all guidance in preparing the project.

February in 1991

Raj Pal Gaba

I. SUMMARY

- 1.1 The project deals with integrated marketing and processing of cotton by the Sanawad Coop-erative Marketing Society Ltd., Sanawad, District Khargone, Madhya Pradesh State, India.

Objectives of the Project :

- 1.2 To increase income of the cotton growers of Sanawad Taluka by increasing processing capacity of seed cotton and by implementing integrated marketing project.
- 1.3 The area of the project will be Sanawad Taluka in Khargone District, Madhya Pradesh State, India. The total area of the Taluka is 61,283 KMS.
- 1.4 The project activity will include expansion of the present ginning capacity from 15,000 bales to 25,000 bales. This will also entail construction of warehousing space for 3000 bales of cotton.
- 1.5 The total project cost is Rs.7.60 million.

1.6 Source of Funds :

- | | | |
|---|------------------|-----------------|
| - | won funds | Rs.0.68 million |
| - | Loan from NCDC | Rs.4.94 million |
| - | from State Govt. | Rs.1.98 million |

Rs.7.60 million

1.7 Implementation period :

- 7 Months

1.8 Expected capacity utilisation :

- Ist year 80 per cent
- 2nd year onwards 90 per cent

1.9 Raw material :

- The society will also encourage pooling system where the farmers will bring the stocks directly to the Society's premises.

- In case raw material is not sufficient, seed cotton is to be procured from the regulated market yard of Sanawad in open auction.

1.10 **Finished Products :**

- Lint cotton
- Cotton seed

1.11 **Organisation & Management :**

The project will be managed by the Society's Board of Directors which comprises 1 Chairman, 1 Vice-Chairman and 11 members. The Project will be implemented by the 38 full time officers and Staff, Out of which 37 are existing officers/staff of the Society and one to be recruited for the purpose. Besides, skilled and unskilled labourers will be employed as per requirement.

1.12 **Financial Highlights (80% Capacity) :**

	Rs. in million
- Fixed cost	1.51
- Variable cost	112.90
- Working capital requirement	
- Ist year	40.00
- 2nd year	50.00
- Break even point (qty) (on 80% utilisation)	10,869 bales (54.68%)
- On 100% utilisation	13,587 bales
- Financial internal rate of return	31.4
- Pay back period	4 years
- Net present value	10.12
- Benefit cost ratio	1.84
- Debit service coverage ratio	3.22,3.96,2.78,3.48 4.36,1-5 years respectively.

1.13 **Benefit To Growers :**

- The increase in income of growers by sale of seed cotton to Society @ 10%
- Assured purchase of cotton by the Society on remunerative prices
- Supply of improved seed, fertilisers, pesticides, insecticides, provision of irrigation facilities and credit at concessional rate.
- Farm guidance and farm technology research for varietal improvements.
- Enhanced dividend after the project matures

II. BACK GROUND

- 2.01 In developing countries like India, which have an agricultural base with considerable potential for growth, the promotion of agro-based industries is of paramount importance to put them on the high road to economic prosperity. This basic concept has been ingrained into the process of planned development in India. Amongst the many crops which provide industrial raw material in India, Cotton is undoubtedly the most important.
- 2.02 Agricultural production has been playing a very crucial and key role in economic development and industrialisation of our country. Cotton crop is one of the major agricultural produce in India.
- 2.03 Cotton Textile Industry & Spinning Mills are feeded by the processed cotton as raw material. Processing of seed cotton (kapas) is done through ginning. Seed cotton (kapas) is bifurcated in processed cotton and cotton seed separated through ginning process. This is one of the traditional industry in India. Gujarat, Maharashtra, Punjab, Madhya Pradesh and Southern States are the major producers of seed cotton (kapas). Therefore, the Textile & Spinning Mills are also located mainly in these areas.
- 2.04 Madhya Pradesh is located in central part of India. Its western belt called Nimar is the main cotton producing area of the State. The present project will be carried out by the Sanwad Cooperative Marketing Society Limited, Sanwad which is located in western Nimar district of Khargone. The black cotton soil which is obtained in the area of operation is highly suited and ideal for cotton production. The State & Central Governments have also initiated cotton development schemes by way of which the area under cultivation is to go up in the coming years. The agro-climatic conditions are also well suited for cotton production. All these salient advantages together with the initiative taken by the Agricultural Department the production of cotton is likely to increase substantially in the coming years.
- 2.05 **Area of the Project :**
- The area of operation of the Sanwad Cooperative Marketing Society Ltd. (Sanwad C.M.S.) extends to Sanwad Taluka (sub-district) of District Khargone, Madhya Pradesh. It is spread to 61,283 KMs. Nett agricultural farm area in the sub-district is 45,880 ha, out of which 15,067 ha. is irrigated. The total area is divided into 129 villages (hemlets). The total population of the area is 107,563. Out of this, 85540 are rural while 22023 are urban. The total number of farmers' house-holds is 16,960.
- 2.06 Cotton, groundnut, feed, rice, beans, soyabean and chillies are the main crops. Cotton is major cash crop of the area. Total area under cotton is 18,000 hectares. The average yield per hectares is 20 to 25 quintals. The total cotton production of the area is about 75,000 bales. Besides, the

cotton produced in nearby areas also arrive in Sanwad market yard for sale. Thus, the total marketable surplus of the area is around hundred thousand bales.

2.07 Problems Faced by Farmers :

The Cotton trade is traditionally being dominated by the private traders. The ginning and pressing of cotton is important value addition to the produce as the spinning mills accept cotton only after ginning and pressing. There is only one cooperative working in the area whose processing capacity is only 15,000 bales for ginning and 25,000 bales for pressing. The Sanwad Cooperative Marketing Society has 36 single roller gins and 32 double roller gins. The 36 single roller gins were installed in the year 1962. They have now become unserviceable and are required to be replaced. The technology of the ginning and pressing has now changed whereby single roller gins have become out-dated and they need to be replaced by double roller gins.

- 2.08 The existing gins do not have pre-cleaning machines. The result is that the fibre quality of ginned lint is poor and the trash content cannot be properly separated from the seed cotton.
- 2.09 The Society has limited warehousing capacity which can hardly accomodate around 1,000 bales of cotton. There is no space available with the Society to store raw-cotton and to safeguard it from unseasonal rains.
- 2.10 As a result of the limited processing and warehousing capacity, the society is able to handle only 15,000 bales which is about 10 per cent of the total market arrivals.
- 2.11 The private sector which is well intrenched in trade provides low prices to farmers for their produce. There are nine ginning and three pressing units in the private sector. Their total ginning capacity is 60,000 bales while pressing capacity is 80,000 bales. The private merchants advance money to the farmers and sometimes pruchase their produce in the field itself. Many a times they reject the stocks of farmers and impose price cuts on the pretext of inferior quality of the stock. The farmers have to wait for one to two days for weighment in the factory compound of private ginning and pressing units. The payments are often made in instalments and many cuts are imposed on flimsy grounds.
- 2.12 The cooperatives are able to handle only 15 per cent of the stock and, therefore, they are able to provide production inputs and farm guidance only to about 15 per cent of the total cotton farmers. In the absence of backward linkage with the Society the farm productivity in the area is not satisfactory.
- 2.13 As India re-enters the world textile market, its strength in international markets will lie in its large base of cotton cultivation. This means that, not only will higher quality yarn be needed,

but would also have to be price competitive in international markets. One of the difficulties being faced by Indian spinning mills in terms of cost reduction is the poor quality of cotton received by them at the spinning stage. It is difficult at present to receive cotton of a high consistent quality i.e. clean and free of waste material. Because of inadequate facilities at the stage of picking, bagging, storing, ginning and bailing processes, the cost of cleaning the cotton falls on the spinning mills. It is estimated that the result of inefficiency in earlier stages could lead upto about 10 per cent loss in the whole cotton crop.

2.14 Need and Justification for the Project :

The Managing Committee of the Sanwad Cooperative Marketing Society has realised the plight of farmers due to its limited processing and warehousing capacity and has now decided to modernise and expand its capacity. It has been recommended that 36 old single roller gins be scrapped and 48 new modernised double roller gins may be installed with automatic pre-cleaner units. It has also been recommended to create additional warehousing capacity by constructing storage space for additional 3,000 bales of cotton. Presently, the Society undertakes ginning & pressing activities for 120 days in a year. It is stipulated that by creation of additional ginning capacity and warehousing space the average working days in a year will be increased from 120 to 150 days.

2.15 The following advantages will accrue by incorporating the ginning and pressing components to the project:-

- i. One of the major advantages of having a modern ginnery would be the speed at which seed cotton is ginned.**
- ii. The unit can establish proper linkages with the growers members, encourage them to grow the right type of cotton and also give them premium on cotton-thus sharing the profits with them.**

2.16 The trash content in the trade varieties produced by the existing ginning factories is very high. By establishing a modern ginning factory, the trash percentage in lint cotton can be controlled well within limits. The increased storage facilities for cotton will facilitate in putting uniform lots according to the type of cotton plants, grade and degree of contamination.

III. PROJECT OF COTTON PROCESSING & MARKETING.

3.01 Objectives :

The project is expected to fulfill the following objectives:-

- i) To expand and modernise processing facility (ginning and pressing of cotton) from 15,000 bales to 25,000 bales.
- ii) To provide backward integration with a view to increase farm productivity and supply credit, fertilisers, irrigation facilities, pesticides and insecticides and farm guidance to the members of the cooperative.
- iii) To improve the quality of processed lint for supply to spinning mills with a view to provide higher return to farmers for their cotton.
- iv) To expand the membership of cooperative and to bring more farmers under the umbrella of cooperative with a view to expand services of the Sanawad Cooperative Marketing Society Limited, Sanawad.
- v) To enhance member farmers' income through price increase for their seed cotton and dividend from the enhanced profit of the Society, together with enlarged reserves for the Society.

3.02 Area of Operation :

The area of operation of the Project will extend to Sanawad Taluka (Sub-district) of Khargone District in Madhya Pradesh. The Sanawad Cooperative Marketing Society Ltd presently has 952 individual farmer members, 16 primary agricultural cooperative marketing society/large size agricultural multi-purpose societies as its members. Besides, it has 30 nominal members. The State Government also holds a share. The total membership of the Society comes to 1001. The Society extends its operation to 18,000 hectares of area which is under cotton crop. The present turnover of the society is 40 million rupees.

3.03 Project Components

3.03.1 Procurement

In the State of Madhya Pradesh cotton is procured in the regulated markets. Seed cotton is auctioned at the market yards according to the rules and regulations prescribed by the Market Committee. Auctions are held in open and generally according to the variety and quality of seed cotton in lots of carts, tractors or in heaps. Quality is assessed on the spot manually and prices are offered according to the current trend of arrivals and more specifically of demand for specific types and varieties. Arrivals are not controlled but often market tends to regulate arrivals in

subsequent days and weeks. It is relevant that small producers have seldom any alternative but to bring seed cotton as soon as it is ready to realise whatever value. There is no chance of hedging or any other means of retrieval once the produce comes to the market. In some of areas traders have a net work of organised buying of seed cotton from the door steps of the farmers. The agents go to the villages and they offer to buy seed cotton. Such practice leads to many irregularities, particularly in weighing and assessment of quality and the price offered.

The Sanawad Society will procure stocks of seed Cotton at Sanawad regulated market yard. It will discourage collections of cotton from the villages as cotton is not a perishable commodity and can be easily transported to the nearest market. Purchases at village point leads to exploitation of farmers in terms of prices and weightment etc. Once the seed cotton is brought to the regulated market, the farmer has an opportunity to sell either to the society or to any other dealer who offers highest price to the grower.

The Sanawad Society will try to pool the produce of its members. In pooling system, the farmers bring their seed cotton pods to the society's gate in their own vehicles. A sample is taken out immediately and decided for its lint cotton and cotton seed value. The price of the produce is determined accordingly. After taking out the same, the goods will be weighed by the society and 75% payment shall be made in advance immediately. The balance 25% of the payment shall be made at the end of the season when the accounts are settled finally. In pooling system the farmer has an opportunity to secure better price for his produce and the price worked out after full realisation of the bales produced out of the cotton procured from the farmer members. In pooling system the farmer usually gets 5 to 7 per cent higher price for his produce in comparison to outright auction system. Another advantage of the pooling system is that the good quality seed secured from the farmers are supplied back to them at reasonable rates which improves farm productivity and the quality of the cotton produced subsequently.

3.03.2 Storage

The seed cotton so procured from the farmers will be placed in the warehouse of the Society so that it is not exposed to the unseasonal rains and other vageries of the weather. The Society will create additional warehousing capacity of 3000 bales which will enable it to procure larger quantity of cotton and store the same for longer period. This will also enable the Society to utilise its ginning and pressing facilities for an average of 150 days in a year as against the present utilisation period of 120 days.

3.03.3 Processing

It is proposed to acquire 48 new double roller semi auto locally made gins. The Society has already 32 double roller gins. Thus the total ginning capacity will be increased to 80 double roller gins.

Roller gins are ideally suited for processing long staple cotton. Hence double roller gins are included in the Project. Double roller gins will, to a large extent, satisfy the following requirements:-

- i) Full stripping of fibres from the seeds,
- ii) Absence of fibre faults and damaged seed and
- iii) Total exclusion of fibre seeds.

It is proposed to acquire modern ginning units consisting of cotton suction, precleaning and 48 nos. of Double Roller Gins. The ginning is proposed to be semi-automatic with provision for electricals and drivers. The feeding of the cotton to the gins is through suction pipe. The gin cotton will be collected by two conveyor belts connecting 12 gins. By adopting this improved ginning method, the seeds will be completely separated without damage to the fibre length of the cotton. It is proposed to acquire hydraulically operated pressing force. It is electrically operated and needs only two operators. The total pressure required is obtained by only two hydraulically operated cylinders. It can press 10 bales per hour.

3.03.4 Safety Measures

Safety programme has to be systematically and routinely implemented by the mill. The modern machines are fully enclosed and are provided with inter-locking systems which preclude the possibility of their being opened without switching off the motive power. The safety regulations are enforced through Factory Act to prevent accidents.

It is essential that not only the safety regulations should be laid down but they should be clearly spelt out to the employees to make them aware of the same for adoption. Accordingly, the following measures should be taken to prevent accidents:

- i) Provide every employee with the operating procedures and practices designed to protect the operatives and equipments from the risk of injury or damage to property;
- ii) Comply with statutory provisions for the protection of health, safety and environment.
- iii) To train all employees, suitably equip them and instruct them to perform their duties in a safe and effective manner and
- iv) To ensure that every employee recognises and discharges his/her responsibility safely and actively participates in maintaining and improving safety standards.

3.03.5 Marketing

a) Sale of cottonseed

It will be sold to MP State Cooperative Oilseeds Federation. The Federation's Oil Mill is located at Barwaha which is 12 KMs from project site. The second alternative for marketing of cottonseed is local sale to vegetable oil manufacturers. They will purchase cottonseed at the premises of the Society in open auction. The daily open auction time will be 4 PM in the evening during peak season.

b) Sale of lint cotton/cotton bales.

The lint cotton/cotton bales will be marketed to cooperative spinning mills in MP. Two of the large size cooperative spinning mills are located very near to the project side and one each in Sanawad and Khargone. The annual requirement of these two spinning mills is 50,000 bales. Another marketing outlet is export of cotton to overseas market through NAFED. The H-4 is the main exportable variety and it is in great demand in Far East and Central European countries.

The public sector national textile mills are also large purchasers of lint cotton for their own consumption. the National Textiles Corporation Mills are located in Indore, Ujjain and Bhuranpur in MP. Besides, there are a number of mills located in Bombay. The project location is on the main Bombay-Agra Highway. It is also well connected with rail and road to different large cities in the country. It has excellent network of communication and, therefore, it has emerged as an important centre for marketing of cotton.

3.03.6 Extension Services

The Society will undertake extension activities including supply of production inputs, arrangement for irrigation facilities, sale of fertilisers, insecticides and pesticides and farm guidance activities with the help of its constituent 16 primary marketing societies at the village level. It will also take help from Cotton Technology Institute, Nagpur and Extension Division of the Agriculture Department of the Government of Madhya Pradesh.

IV. DETAILS OF OPERATIONS

4.1 Plant Capacity

The total capacity of the ginning and pressing plant will be 25,000 cotton bales.

4.2 Location

The location of the plant shall be 2 KMs from the office of Sanawad Cooperative Marketing Society adjacent to ginning and pressing unit of the Society.

4.3 Main Products

The main products of the Unit will be lint cotton besides cottonseed.

4.4 Processing operation

The farmer will bring the seed cotton to the factory gate. It will be weighed on the weigh bridge and will be placed in the heaps/warehouse.

From the warehouse, the seed cotton will be brought to the cleaner. The cleaner will separate the trash and other foreign matters from the seed cotton. After cleaning, it will be brought to double roller gins where the cottonseed will be separated from the cotton lint. The lint cotton will be filled in sacks and taken for pressing. It will be pressed hydraulically. It will then be rapped in hessian cloth and iron strips. The standard packing shall be 170 kg (1 bale). The cotton seed will be stored in the warehouse for sale.

4.5 Investment Plan :

Cost of Project	Rs. in millions
(a) building & godowns	3.65
(b) Plant & Machinery	3.07
(c) Electrical fittings	0.26
(d) Furniture, fixtures & fittings	0.05
(e) Contingencies including preoperative expenses	0.57
*(f) Margin Money for working capital	8.00
Total:	7.60

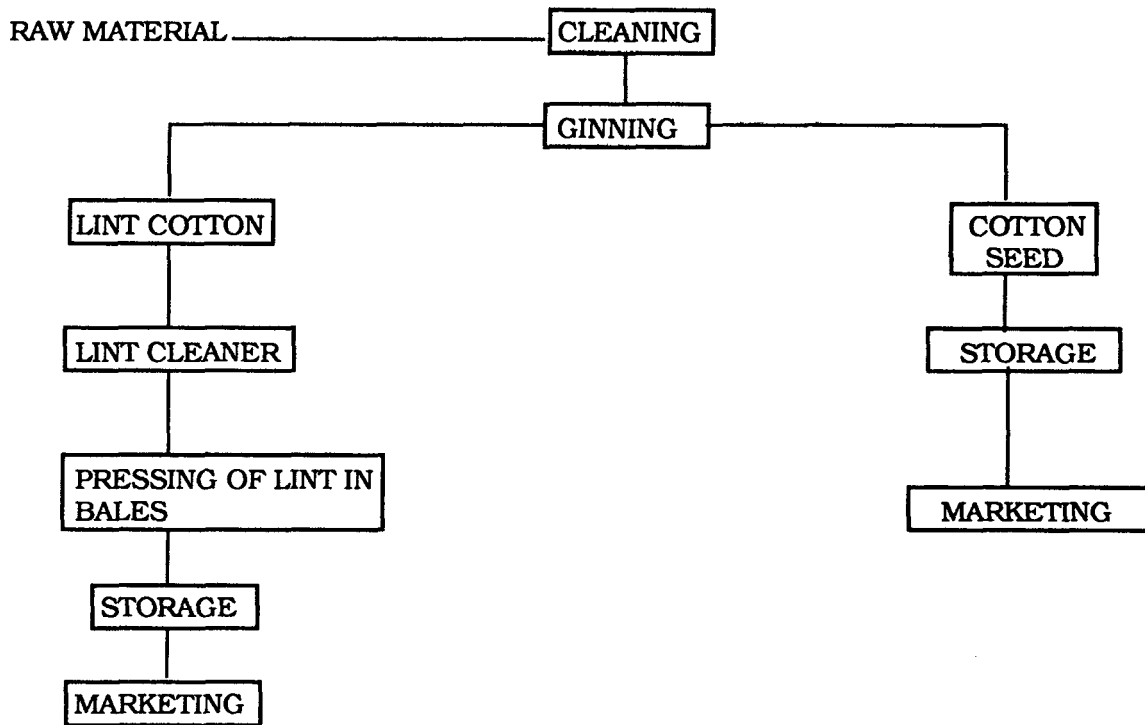
Source of Finance:

(a) Society's capital		0.68	
(b) Term loans			
from NCDC	4.94		
From State Govt.	1.98	6.92	
	Total		7.60

National Cooperative Development Corporation is a Corporation promoted by Central Govt. for financing the cooperative processing units. The NCDC will finance 65% of the total project cost. The loan will be repaid in 12 equal instalments together with interest. The repayment schedule will start from 3rd year. 26% of Project cost will be met by the loan raised from State Govt. The balance 9% will be raised by the Society's own resources.

* Margin money has not been provided because the operation is seasonal and cash accruals during the operation period would be adequate to serve this purpose.

FLOW CHART OF COTTON PROCESSING



STATEMENT OF WORKING CAPITAL REQUIRED

Particulars	@ 80% capacity (Rs. in million) (Rs.)	@ 90% capacity (Rs.)
Purchase of Seed Cotton	25.60 (1 Month)	30.29
Purchase expenses	0.77 (1 Month)	0.91
Factory Wages (5 Months)	0.26 (1 Month)	0.29
Factory Wages (12 Months)	0.02 (1 Month)	0.03
Salaries	0.04 (1 Month)	0.05
Store & Spares	0.20 (2 Months)	0.24
Repair & Manufacture	0.07 (1 Month)	0.08
Power & Fuel-	(Credit)	-
Oil expenses	0.05 (2 Months)	0.05
Office expenses	0.03 (1 Month)	0.03
Packing expenses	0.24 (1 Month)	0.35
Selling expenses	-(after sale)	-
	27.28	32.32
Sales (Credit)	16.40 (1 Month)	19.83
	43.68	52.15

Or say Rs. 40.00 millions

Rs.50.00 million

The interest has been calculated at Rs.0.55 interest Per month on Rs.40. million @16.5%. Total interest Rs.0.55 million x 4 months Rs.2.20 million in the 1st year.

Note: i) The working capital has been calculated keeping in view the peak season of five months. After and before this, the expenses are very nominal. As such no working capital is required. The cotton seed is sold on cash basis. Accordingly the provision for this has been made in the calculations of required working capital.

ii) From the 2nd year onwards, the working capital is based on Rs. 50. million (@ 90% capacity), minus cash accrual of the year (As per cash flow statement).

4.7 Production

The project life will be for a period of 15 years. The production schedule for the fifteen years shall be as under:-

PRINCIPLE PRODUCTION OF LINT COTTON (COTTON BALES)

Years	Net operating Days	Installed capacity in Tonnes	Capacity machine operation	Tonnes of seed cotton	(Lint 33% recovery (in Tonnes)	No. of Bales	Cotton seed 65% recovery (in Tonnes)
1	150	12800	80%	10240	3380	19878	6656
2	150	12800	90%	11520	3802	22362	7488
3	150	12800	90%	11520	3802	22362	7488
4	150	12800	90%	11520	3802	22362	7488
5	150	12800	90%	11520	3802	22362	7488
6	150	12800	90%	11520	3802	22362	7488
7-10	150	12800	90%	11520	3802	22362	7488
11-15	150	12800	90%	11520	3802	22362	7488

4.8 Procurement of Raw Material :

The procurement of raw material will be made from the local regulated market as well as from the farmers who directly bring their produce to the factory gate on pooling basis.

SCHEDULE OF RAW MATERIAL REQUIRED

Years	Installed capacity in Tonnes	Capacity utilization	Raw material of seed cotton required in Tonnes
1	12800	80%	10240
2	12800	90%	11520
3	12800	90%	11520
4	12800	90%	11520
5	12800	90%	11520
6	12800	90%	11520
7-10	12800	90%	11520
11-15	12800	90%	11520

4.9 Sales Turnover :

The sale turnover of the output for the next five years shall be as under:-

(Rs. in million)

Year	1st	2nd	3rd	4th	5th
Cotton Lint	82.00	95.01	97.86	100.80	103.82
Cotton Seed	33.28	38.00	38.57	39.15	39.74
Total	115.28	133.01	136.43	139.95	143.56
Misc.	0.40	0.41	0.42	0.43	0.44
Total:-	115.68	133.42	136.85	140.38	144.00

The assumed sales prices for cotton lint and cotton seed are Rs.4225 per bale and Rs.5,000 per tonne, respectively. In addition, we have assumed inflation rates of 3% for cotton lint price and 1.5% for cotton seed price.

4.10 Packing

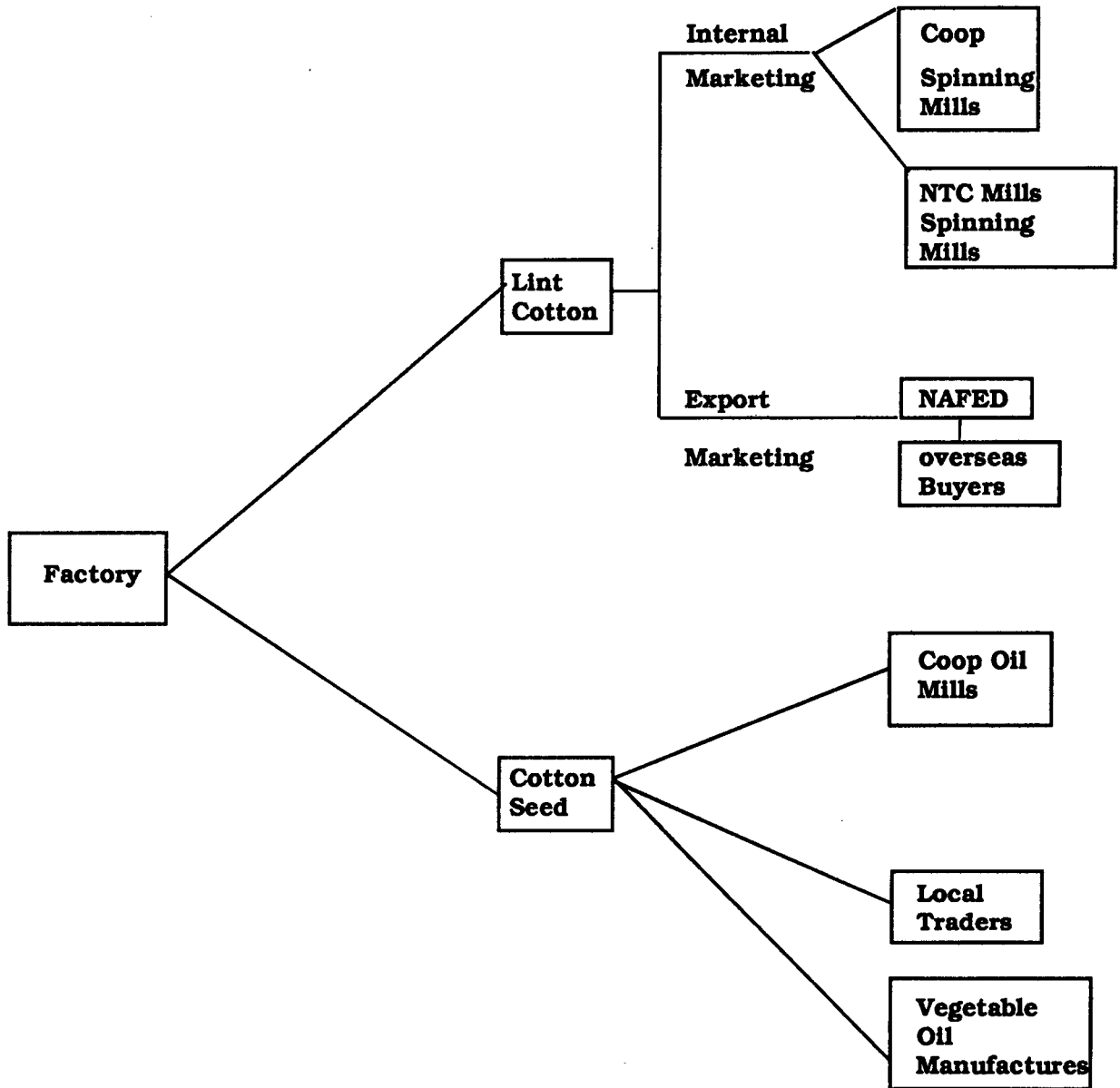
The packing of the lint cotton shall be made in hessian cloth tied by iron strips. The weight of one pack will be around 170 kg.

4.11 Marketing Channel

- i) The domestic market will be done directly by the Society to cooperative spinning mills.
- ii) The overseas marketing will be done through National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED).
- iii) Cottonseed will be sold directly to the cooperative oil mills. Alternatively the cottonseed will be sold to local oil processing units and vegetable oil units through auction.

The channel of marketing will be decided on the basis of best prevailing prices at a particular point of time.

Chart of Marketing Channel



4.12 **Market Information System :**

The market intelligence will be covered regularly from NAFED & cooperative spinning mills as well as cooperative oil mills by telephone, telex and daily newspapers.

The daily paper named TECOYA is published from Bombay which gives prevailing rates of different varieties of lint cotton and yarn.

4.13 **Construction Schedule :**

The land is already available with Sanawad Cooperative Marketing Society Limited. The construction of warehouse and installation of new rollers will take approximately seven months. The work will begin immediately after sanction of the Project by the financial institutions, say, by August, 1991.

The civil work for the factory will be completed by October, 1991 while installation of machinery and rollers etc. and the construction of godowns will be completed by November 1991. The trial runs will be carried out in December 1991.

4.13.1 **Project Implementation Schedule :**

(June - December' 1991)

Activity	Duration
a) Arrangement of finance	1-2nd months (June-July, 1991)
b) Construction of buildings	3-5th months (August-October, 1991)
c) Electrification of plant installation	6th month (November, 1991)
d) Construction of godowns	3-6th months (August-November, 1991)
e) Trial runs	7th month (December, 1991)

4.14 **Project Implementation :**

The Project will be implemented by Sanawad Cooperative Marketing Society Limited, Sanawad, District Khargone, Madhya Pradesh State, India.

4.15 **Amount of Raw Material :**

The schedule of raw material purchase for the first years is as under:-

Year	Capacity installed in terms of seed cotton	Operating %	Seed cotton required On Rs.	Amount Rs. in millions
Ist	1,28,000	80%	1,02,400	102.40
2nd	1,28,000	90%	1,15,200	117.71
3rd	1,28,000	90%	1,15,200	120.06
4th	1,28,000	90%	1,15,200	122.46
5th	1,28,000	90%	1,15,200	124.91

4.16 **Season of Harvesting & Processing**

Months

1	2	3	4	5	6	7	8	9	10	11	12

* Harvesting _____

* Processing Season - - - - - Depending upon the availability of Raw Material

V. ORGANISATION & MANAGEMENT

5.01 Overall Management Policy :

The project will be implemented by the Board of Directors of Sanwad C.M.S. The composition of Board of Directors of the Society is as under:-

Chairman	1
Vice-Chairman	1
Directors	11

The Board of Directors normally meets once in every month. For efficient management of the activities of the Society the Board of Directors will frame the Constituted committees:

- i) Purchase Committee;
- ii) Executive Committee;

The Chairman and Vice-Chairman have been delegated with full powers for taking on the spot decisions on the day to day management of the Society. Accordingly, the Chairman and Vice-Chairman normally attend office every day during the five months period when the cotton processing is in progress.

The Manager of the Society is a Govt. Officer who has come to the Society on deputation for a period of three years. He is the executive head of the Society. He will be responsible for implementation of the project under the overall guidance and supervision of the Chairman, Vice-Chairman and the members of Board of the society.

5.02 Management & Organisation :

The day to day activities of the project will be divided into five divisions:-

5.02.01 Procurement of Raw Material :

The cotton selectors will be responsible for procurement and price fixation of the raw-material. They will plan purchases of quality raw material in such a way that sufficient quantity of raw-material is always available for the Factory. The cotton selectors will ensure that only good quality staple cotton free from trash, moisture and foreign matter is purchased. They will always be quality and cost conscious. The godown keeper will ensure weighing of the stocks and

safe storage of the stock according to the grades.

5.02.02 Finance Division :

This division will work under the supervision of Accountant. He will be responsible for making timely payments to the growers on the basis of the purchase slips issued by cotton selectors and the godown keeper. He will be responsible for proper maintenance of the books of accounts, cash and bank accounts.

5.02.03 Processing Division :

This Division will work under overall charge of factory supervisors. Each supervisor will control certain numbers of double rollers. The fitter, jobber, workmen, mechanics etc. will ensure proper upkeep and maintenance of factory machinery and equipment. The factory supervisors will have important role in cost effective operations of the machine. They will ensure maximum capacity utilisation of the unit.

5.02.04 Marketing Division :

The manager of the society will be directly in-charge of the marketing division. He will be assisted by cotton selectors and factory supervisors. He will maintain proper marketing intelligence and collect rates for different quality lint cotton from spinning mills. He will also keep an eye on prevailing rates of cottonseed in different markets. He will ensure that the finished products are sold at best possible rates. He will also ensure proper despatch and transportation of the stocks sold.

5.02.05 Input Supply Division :

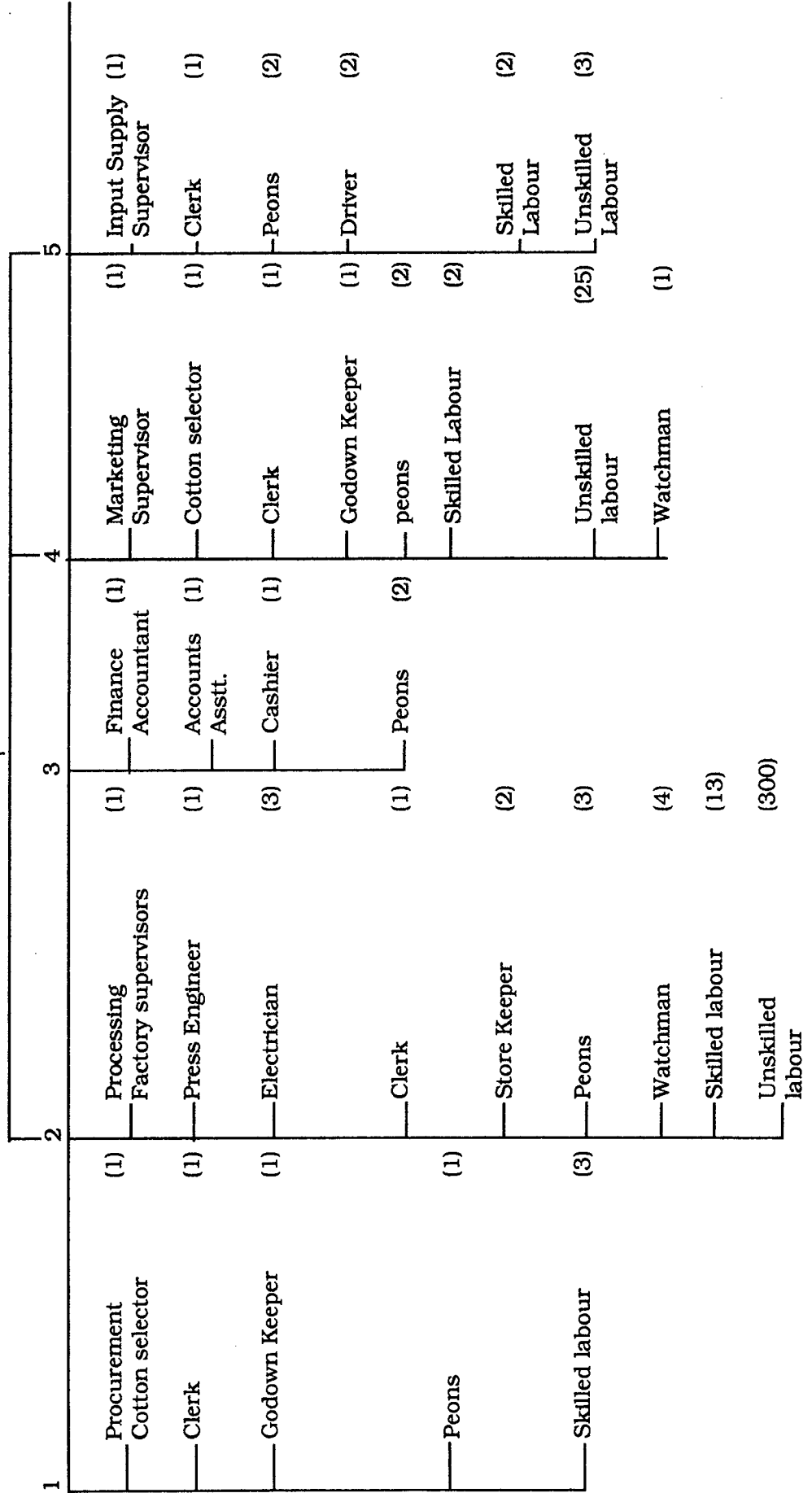
This division will work under overall charge of the Supervisor. During sowing and harvesting period of cotton, there will not be any processing activities in the factory and therefore, their services should be utilised for farm guidance and inputs supply. Each supervisor will be incharge of 5 village level cooperative societies. The farm input will be supplied through the village cooperative societies. The farm guidance activities will be undertaken directly by the supervisors in association with the Agriculture University staff and Govt. Extension workers. The objective of the farm guidance activities is to improve the post harvest technology of cotton and also to secure improved seeds from Narmada Cooperative Seed Society which is locally situated in Sanwad. The fertilisers, pesticides and insecticides will be purchased by the society from MP State Co-operative Marketing Federation, IFFCO & KRIBHCO.

ORGANIZATION CHART

BOARD OF DIRECTOR

CHAIRMAN

MANAGER (1)



5.02.06 Personnel & Administration Division

This division will be directly under the charge of the Manager of the Society. He will look after the welfare activities of the labour and ensure observance of the regulations under the Factory Act, payment under the Wages Act and other statutory regulations.

VI. FINANCIAL ANALYSIS

The project life has been assessed for the purposes of financial analysis as 15 years. The total investment in plant & machinery, building and civil work pertaining to warehouse construction comes to Rs.6.60 million. The investment will be made in one phase and the construction of building and warehouse and installation of plant & machinery is likely to take 7 months. The maximum capacity utilisation will be achieved in 2 years. The maximum plant utilisation capacity according to industrial norms is 90 per cent. The plant is a seasonal processing plant and depending on availability of raw material it can operate from 150 day to 180 days in a year.

6.1 The details of financial analysis are given in the following paras;

6.1.1 **Cost Of-Project & Mode of Finance :**

6.1.2	Cost of Project	Rs. in millions
	- Building & godowns	3.65
	- Plant & Machinery	3.07
	- Electrical fittings	0.26
	- Furniture, fixtures & Fittings	0.05
	- Contingencies including pre-operative expenses	0.57
	Total:	7.60

6.1.3 **Source of Finance :**

(a) Society's capital		0.68
(b) Term loans-		
from N.C.D.C.	4.94	
from State Govt.	1.98	6.92
	Tota:	7.60

6.1.4 **Building & godowns :**

- Factory building		1.33
- Godowns		2.32
		3.65

6.2 **Plant & Machinery :**

Details of plant & machinery proposed to be purchased is as under:-

S.No.	Particulars	Nos.	Amount (Rs. in million)
1.	Double roller, cotton, gin suitable for vee-belt drive with steel gears	48	1.26
2.	Screw conveyor for gins with electric mother pulley	4	0.14
3.	Special type fidding angle iron structure for cotton platform	104	0.06
4.	Electric motors	52	0.24
5.	Busher panel	8	0.10
6.	Weighing scale	2	0.40
7.	Cleaner	4	0.40
8.	Automatic feeder	4	0.40
9.	Other spares	-	0.07
	Total :		3.07

Note: All The Machines are Locally Available.

6.3.1 **Electrical Fittings :**

The electrical fittings required for the unit will comprise internal cable work of the factory, transformer and deposit to be kept with the electricity board for getting the power connection. The estimated cost of this comes to Rs.0.26 million.

6.3.2 **Power:**

The maximum power requirement of the proposed industrial unit is 500 HP. The expenditure on power is as detailed below:

Total maximum power requirement at 100% capacity-

500 HP conversion of HP into K.W.

HP x .746 = KW

500 x .746 = 373 KW

Conversion of KW into units

$KW \times \text{hours per day} \times \text{working hours} = \text{units}$

$373 \times 16 \times 150 = 8,95,200 \text{ units}$

Taking units at 80% and 90% capacity, 716,100 and 805,680 respectively costs Rs.0.72 millions and

0.81 millions at 80% and 90% capacity respectively.

(It is assumed that the price per unit of power will increase @ 5% from year to year)

6.3.3 Machinery Repairing & Maintenance :

The unit will have to incur expenditure to maintain the machinery and building in working condition. The expenditure on this head will increase over the years. The expenditure on this head has been estimated @ 5% on the existing fixed investments in Building & Plant & Machinery and @ 2% on the new machinery and buildings. On the aforesaid basis the expenditure will be as under:-

Particulars	Rs. (in millions)	%	Amount of expenditure (in millions)
Existing Assets	4.0	5%	0.20
New Assets	7.6	2%	0.15

(It is assumed that the repair & maintenance will increase @ 5% per annum) from 2nd year onwards)

6.4 Contingencies

The provision for contingencies represents the provision done for escalation of cost due to time related factors, inflation and unforeseen circumstances. The provision for the same is done on an average @ 8% of the amounts to be invested in the assets.

6.5 Financial Projections :

Installed & Utilisation of Capacity :

Year	Installed Capacity Cotton Ginned (In Quintals)	Capacity Utiliation (%)	Cotton Ginned (In Quintals)
Ist	1,28,000	80%	1,02,400
2nd & ONWARDS	1,28,000	90%	1,15,200

6.6 Production :

YEAR	COTTON		COTTONSEED (in qtls)	SHORTAGE (Normal)
	(in bales)	(in qtls)		
Ist	19,878	33,792	66,560	2048
2nd & ONWARDS	22,362	38,016	74,880	2304

6.7 SALES :

- Sale of cotton bales:			
19,878 bales @ 4125/- per bale	Rs.	82.00	million
- Sale of Cottonseed:			
66,560 qutls @ Rs.500/- per qtl	Rs.	33.28	million
		115.28	million

(It is assumed that the selling price of cotton lint will be increased @ 3% each year from 2nd year onwards & the cottonseed price will be increased @ 1.5% each year from 2nd year onwards)

6.7.1 Cost Components :

The main cost component of the project will be as follows:-

- Purchases
- Employee remuneration
- Power & fuels
- Stores and spare parts.

6.10.1 Factory Wages :

The expenditure on this head is detailed below:

S.No.	Particular	No.of persons	Wages per month per person (Rs)	Total per annum (Rs)
1.	Skilled labour	20	900/-	90,000/-*
2.	Unskilled labour	328	700/-	11,48,000-*
3.	Factory supervisor	3	2100-	75,600/-
4.	Press engineer	1	1500/-	18,000/-
5.	Electricians	3	1600/-	57,600/-
6.	Watchman	5	800/-	48,000/-
Total:				14,37,200/-
Add 5% for prerequisites/benefit				71,860/-
				15,09,060/-
or Say Rs. 1.51 million				

*These figure have been taken for the season only) (i.e. for 5 months only).

The wages for subsequent years till third year and onwards will be increased @ 5% per annum.

6.10.2 Administrative Salaries :

The expenditure on this head is as follows:-

Particular	No. of person	Salary per month per person (Rs.)	Total salary per annum (Rs.)
Manager	1	2500/-	30,000/-
Accountant	1	2200/-	26,400/-
Accounts Asstt.	1	2000/-	24,000/-
Cashier	1	2000/-	24,000/-
Clerks	4	1300/-	62,400/-
Cotton selector	2	1900/-	45,600/-
Peons	10	1100/-	1,32,000/-
Store keeper	2	1700/-	40,800/-
Godown keepers	2	1700/-	40,800/-
Drivers	2	1300/-	31,200/-
		Total:-	4,57,200/-
Add: 10% for other benefits and prerequisites			45,720/-
		Total:	5,02,920/-
		Or say	Rs. 0.50 million

The salaries to administrative staff are estimated to increase @10% per annum.

6.11 Administrative & Office Expenses :

Expenditure under this head will involve expenditure under the following sub heads at the following annual rates for the first year:-

	Rs. in millions
1. Travelling expenses	0.15
2. Stationary and printing	0.03
3. Miscellaneous expenses	0.03
4. Insurance expenses	0.05
5. Postage and telephone	0.01
6. Legal and professional	0.01
7. Entertainment & staff welfare	0.02
Total :	0.30

The expenditure under the above heads is estimated to increase at the rate of 10% per annum.

- 6.12 The yearly projections of profitability and its appropriation flows are provided in Annexure 6 and the computation of the measures of investment are given in Annexure 8
- 6.13 On the basis of financial analysis given above the net present value of the Project is Rs.10.12 million. The break even point would be as under:-

	Rs. in million
Sales & misc. receipts	115.68
Variable expenses	112.90
Contribution	2.78
Fixed expenses	1.52

$$\text{BEP at (\% age) of capacity} = \frac{\text{Fixed expenses}}{\text{Contribution}} \times 100$$

$$\text{BEP at (80\%) of capacity} = \frac{1.52}{2.78} \times 80$$

BEP is at 54.68% capacity utilisation on the 80% capacity.

i.e. 10869 cotton Bales

- 6.14 The IRR of the Project will be 31.4%.
- 6.15 The benefit cost ratio of the project has been estimated at 1.84.
- 6.16 The pay-back period stands at 4 years.
- 6.17 The debt service coverage ratio will be as under:

Years	1st	2nd	3rd	4th	5th
Rs. in million	3.22	3.96	2.78	3.48	4.36

6.18 Details at Annexure 9

Thus, the results of financial analysis indicate that the project is viable.

VII. CASH BUDGET

7.01 Cash Budget

The cash budget for the first 5 years of the project is given on the next page. The budget for all the 15 years is given in Annexure No.7

7.01.1 The assumptions are :

- Prices of sale of lint cotton increase by 3% of cotton seed by 1.5% and miscellaneous receipts by 2% every year.
- The prices of procurement of seed cotton (kapas) increase by 2% per year.
- Expenses, factory wages, spares and storage, and power and fuel increase by 5% per annum.
- Expenses on maintenance and repairing increase by 10% per year.
- Profit utilized as under:
 - a) 50% Reserve funds.
 - b) 20% price fluctuation funds.
 - c) 10% patronage rebate to the farmers.
 - d) 10% dividend
 - e) 10% other socio economic activities

CASH FLOW STATEMENT

(Rs. in millions)

Particulars	1st year	2nd year	3rd year	4th year	5th year onwards	
		(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
OPENING BALANCE B/F	-	1.69	3.55	5.39	7.82	
RECEIPTS						
Societies capital a/c	0.68	-	-	-	-	
Loan from NCDC	4.94	-	-	-	-	
Loan from State Govt.	1.98	-	-	-	-	
Sales receipts	115.28	133.01	136.43	139.95	143.56	
Misc. Receipts	0.40	0.41	0.42	0.43	0.44	
Cash credit from bank	40.00	48.70	47.00	45.40	42.20	
Total	163.28	183.81	187.40	191.17	194.02	
Less: Payments						
Purchase of fixed assets	7.60	-	-	-	-	
Purchase of Kapas	102.40	117.71	120.06	122.46	124.91	
Purchase expenses	3.07	3.53	3.60	3.67	3.75	
Factory wages	1.51	1.78	1.87	1.96	2.06	
Stores and spares	0.51	0.60	0.63	0.66	0.70	
Machinery repair & Mant.	0.35	0.39	0.43	0.47	0.52	
Power & Fuel	0.72	0.85	0.89	0.93	0.98	
Administrative salaries	0.50	0.55	0.61	0.67	0.74	
Other office expenses	0.30	0.33	0.36	0.40	0.44	
Packing expenses	1.20	1.43	1.50	1.58	1.66	
Selling expenses	0.47	0.56	0.52	0.62	0.65	
Interest on T/L paid	0.76	0.76	0.76	0.70	0.63	
Repayment of principal	-	-	0.58	0.58	0.58	
Interest on C/C paid	2.20	2.68	2.59	2.50	42.20	
Repayment of C/C a/c (Bank)	40.00	48.70	47.00	45.40	42.20	
Dividends paid	-	0.13	0.18	0.25	0.33	
Patronage rebate	-	0.13	0.18	0.25	0.33	
Other socio economic activities	-	0.13	0.18	0.25	0.33	
Total:-	161.59	180.26	182.01	183.35	183.13	
Closing balance	1.69	3.55	5.39	7.82	10.89	

VIII. RECOMMENDATIONS

The cooperatives can play a very important role in emulating the socio-economic conditions of the farmers by the following two factors:-

- a) by decreasing cost of production of the farm produce by supplying better inputs and farm guidance activities.
- b) by increasing the price of the final produce by value addition through processing and improved marketing practices.

- 8.01 The rural cooperatives in India have greater scope for vertical, horizontal, backward and forward integration through which they can improve socio-economic conditions of the rural India and transform the life of member farmers.
- 8.02 Cotton is a very important cash crop for the farmers in Madhya Pradesh. The basic problem of cotton growers has been the lack of improved quality of seed cotton. The varietal improvement will not only provide better prices to the farmers but will also increase foreign exchange earnings of the country. Therefore, it is recommended that the Agricultural Research University of Madhya Pradesh may take up intensive research in varietal improvement of cotton.
- 8.03 The State & Central Govts. will add a yeoman service by providing a suitable role to the cooperatives for procurement and marketing of cotton growing areas of the State. It is, therefore, recommended that all extension services rendered by the Govt. may be coordinated by the cooperatives working in the area.
- 8.04 The membership of the cooperatives should be made universal and all farmers growing cotton should be brought under the umbrella of the cooperatives so that they may get better farm guidance, farm inputs and services as well as may secure better prices for their cotton by joining the pooling system.
- 8.05 The price secured by the farmers depends on proper post harvest care, grading and classification of the stocks variety-wise. It is, therefore, recommended that farmers in their fields should be given proper training so that they bring stocks to the factory containing moisture not more than 8%. They should also be trained for properly of grading stocks so that the stocks brought by the farmers to the factory gate should get better price. The farmers may be advised to dry their cotton, if necessary by placing it on the floor to bring down the moisture content to the optimum. In order to ensure proper grading, the factory may appoint cotton selectors with suitable qualifications and experience.

8.06 The Society should develop close coordination with the national level organisations like National Agricultural Cooperative Marketing Federation of India Ltd (NAFED) in order to tap additional sale outlets of lint cotton within the country and to boost export of cotton to foreign destinations. Similarly, the Society may take the help of NAFED in getting better prices for cottonseed.

8.07 The project discussed in the report is recommended for commissioning on the basis of the following financial highlights:

a) **Capital expenditure**

New:	Rs. 7.60 million
Existing:	Rs. 4.41 million
Total:	Rs. 12.01 million

b) **Viability results**

NPV	Rs. 10.12 million
BCR	1.84
IRR	31.4%
Pay back	4 years

c) **Sensitivity Analysis Results**

Recovery of cotton lint falls from 33% to 32.5%, cotton seed recovery stays the same at 65%,

NPV	=	Rs. 2.45 million
BCR	=	1.20
IRR	=	21.4%
Pay back	=	6 years

**STATEMENT OF INVESTMENT ON TERM LOAN & REPAYMENT SCHEDULE
FOR LOANS RECEIVED FROM NCDC AND STATE GOVT.**

AMOUNT OF LOAN	RATE OF INTEREST	TERMS & REPAYMENT
From NCDC	Rs.4.94 millions	Principal amount
From State Government	Rs.1.98 millions	In the first 2 years, nothing is payable and from the 3rd year onward it is payable in 12 instalments on yearly basis.
Total:	Rs.6.92 millions	Interest
		Interest is payable on yearly basis.

(Rs. in millions)

At the end of the year	REPAYMENT		Closing balance (Rs.)
	Opening Balance (Rs.)	Principal (Rs.)	
1st	6.92	—	6.92
2nd	6.92	—	6.92
3rd	6.92	0.58	6.34
4th	6.34	0.58	5.76
5th	5.76	0.58	5.18
6th	5.18	0.58	4.60
7th	4.60	0.58	4.02
8th	4.02	0.58	3.44
9th	3.44	0.58	2.86
10th	2.86	0.58	2.28
11th	2.28	0.58	1.70
12th	1.12	0.58	1.12
13th	1.12	0.58	0.54
14th	0.54	0.54	—

STATEMENT OF DEPRECIATION ON FIXED ASSETS ON STRAIGHT LINE METHOD

S.NO	Particular	(Rs. in millions)				
		Cost (Rs.)	Estimated scrap value	Net cost (Rs.)	Life for expected No. of years	Depreciation Per year (Rs.)
A. EXISTING ASSETS						
1.	Land	0.50	-	-	-	-
2.	Buildings	0.26	-	-	-	0.009 *
3.	Plant & machinery	2.92	-	-	-	0.031 *
4.	Vehicles	0.73	-	-	-	0.020 *
	Total	4.41				
B. NEW ASSETS						
1.	Building & Godown	3.65	0.36	3.29	20	0.164
2.	Plant & Machinery	3.07	0.31	2.76	15	0.184
3.	Electric fittings	0.26	0.03	0.23	15	0.015
4.	Furniture	0.05	0.01	0.04	15	0.003
	Total	7.03	0.71			0.426

* The additions to the fixed assets have been made from year to year for which detail is not available. Therefore the depreciation has been charged, by keeping in view, the condition of the assets as on the date.

STATEMENT OF BIFURCATION OF EXPENSES IN VARIABLE AND FIXED COSTS

Particulars	(Rs. in millions)		
	Total	Variable(%) Cost	Fixed(%) Cost
Purchase of Seed Cotton	102.40	102.40 (100%)	—
Expenses on Purchases	3.07	3.07 (100%)	—
Factory Wages	1.51	1.51 (100%)	—
Stores and Spares	0.51	0.41 (80%)	0.10 (20%)
Machine Repair and Maintenance expenses	0.35	0.28 (80%)	0.07 (20%)
Power and Fuel	0.72	0.72 (100%)	—
Administrative salaries	0.50	0.40 (80%)	0.10 (20%)
Office expenses	0.30	0.24 (80%)	0.06 (20%)
Packing expenses	1.20	1.20 (100%)	—
Selling expenses	0.47	0.47 (100%)	—
Intercom T/C	0.76	—	0.76 (100%)
Depreciation	0.43	—	0.43 (100%)
Interest on working capital	2.20	2.20	—
	114.42	112.90	1.52

BREAK EVEN POINT CHART

RECEIPTS		(Rs. in millions)
Sales	115.28	
Misc.Receipts	<u>0.40</u>	
		115.68
Less Variable Expenses		112.90
Contribution		2.78
Fixed Expenses		1.52
BEP at (% age) of capacity	= $\frac{\text{Fixed Expenses}}{\text{Contribution}} \times 100$	
BEP at (80% capacity)	= $\frac{1.52}{2.78} \times 100 = 54.68$	
Which is equivalent to	= 10,869 bales	
The BEP at 100% capacity utilization covered	$\frac{19878}{0.80} \times 0.5468$	
	= 13587 bales.	

PROFITABILITY STATEMENT

(Rs. in Millions)

S.NO	Particulars	1st year (Rs.)	2nd year (Rs.)	3rd year (Rs.)	4th year (Rs.)	5th year (Rs.)
1.	Installed capacity	1,28,000(Qtls)	1,28,000(Qtls)	1,28,000(Qtls)	1,28,000(Qtls)	1,28,000(Qtls)
2.	Working days	150 days	150 days	150 days	150 days	150 days
3.	No. of shifts	Double	Double	Double	Double	Double
4.	Proposed capacity utilisation	80%	90%	90%	90%	90%
5.	Quantity of Seed Cotton to be ginned	1,02,400(Qtls)	1,15,400(Qtls)	1,15,400(Qtls)	1,15,400(Qtls)	1,15,400(Qtls)
6.	RECEIPTS					
(a)	Sales of cotton lint (Bales)	82.00	95.01	97.86	100.80	103.82
(b)	Sale of cotton seed	33.28	38.00	38.57	39.15	39.74
(c)	Miscellaneous Receipts (PDS, Supply of inputs etc.)	00.40	00.41	00.42	00.43	00.44
	Sub total (a)	115.68	133.42	136.85	140.38	144.00
7.	EXPENSES					
A.	Production Expenses					
(a)	Purchase of Kapas Seed Cotton	102.40	117.71	120.06	122.46	124.91
(b)	Expenses on Purchases	3.07	3.53	3.60	3.67	3.75
(c)	Factory wages	1.51	1.78	1.87	1.96	2.06
(d)	Stores & spare parts (including oiling expenses)	0.51	0.60	0.63	0.66	0.70
(e)	Machinery Repair and Maintenance	0.35	0.39	0.43	0.47	0.52
(f)	Power and Fuel	0.72	0.85	0.89	0.93	0.98

PROJECTED PROFITABILITY STATEMENT FOR 15 YEARS

PARTICULARS:	(Rs. in millions)														
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
RECEIPTS:															
Sales	115.28	133.01	136.43	139.95	143.56	144.18	144.90	145.62	146.35	147.45	148.56	149.67	150.79	151.92	153.06
Misc. receipts	0.40	0.41	0.42	0.43	0.44	0.44	0.44	0.44	0.44	0.44	0.45	0.45	0.45	0.45	0.45
TOTAL:	115.68	133.42	136.85	140.38	144.00	144.62	145.34	146.06	146.79	147.89	149.01	150.12	151.24	152.37	153.51
PAYMENTS:															
Purchases	102.40	117.71	120.06	122.46	124.91	125.53	126.16	126.79	127.43	128.06	128.70	129.35	129.99	130.64	131.30
Manufacturing Exp.	6.16	7.15	7.42	7.69	8.01	8.17	8.33	8.50	8.67	8.84	9.02	9.20	9.38	9.57	9.76
Admn. Exp.	0.80	0.88	0.97	1.07	1.18	1.24	1.30	1.36	1.43	1.50	1.58	1.66	1.74	1.83	1.92
Marketing Exp.	1.67	1.99	2.09	2.20	2.31	2.37	2.43	2.49	2.55	2.61	2.68	2.75	2.82	2.89	2.96
SUB. TOTAL	111.03	127.73	130.54	133.42	136.41	137.31	138.22	139.14	140.08	141.01	141.98	142.96	143.93	144.93	145.94
Profit before Dep. & Int.	4.65	5.69	6.31	6.96	7.59	7.31	7.12	6.92	6.71	6.88	7.03	7.16	7.31	7.44	7.57
Intt. on T/L	0.76	0.76	0.76	0.70	0.63	0.57	0.51	0.44	0.38	0.31	0.25	0.19	0.12	0.06	-
Intt. on Working Cap.	2.20	2.68	2.59	2.50	2.32	2.22	2.07	1.92	1.77	1.62	1.47	1.31	1.13	0.94	0.74
Depreciation	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
TOTAL:	3.39	3.87	3.78	3.63	3.38	3.22	3.01	2.79	2.58	2.36	2.15	1.93	1.68	1.43	1.17
NET PROFIT:	1.26	1.82	2.53	3.33	4.21	4.09	4.11	4.13	4.13	4.52	4.88	5.23	5.63	6.01	6.40
APPROPRIATION OF PROFITS:															
Reserves & Other Funds(50%)	0.63	0.91	1.27	1.67	2.11	2.05	2.06	2.07	2.07	2.26	2.44	2.62	2.82	3.01	3.20
Price fluctuation funds(20%)	0.24	0.37	0.51	0.67	0.84	0.81	0.82	0.83	0.83	0.64	0.67	0.72	0.80	0.84	0.89
Dividends (10%)	0.13	0.18	0.25	0.33	0.42	0.41	0.41	0.41	0.41	0.54	0.59	0.63	0.67	0.72	0.77
Other Socio Eco. activities (10%)	0.13	0.18	0.25	0.33	0.42	0.41	0.41	0.41	0.41	0.54	0.59	0.63	0.67	0.72	0.77
Patronage rebate (10%)	0.13	0.18	0.25	0.33	0.42	0.41	0.41	0.41	0.41	0.54	0.59	0.63	0.67	0.72	0.77

PROJECTED CASH FLOW STATEMENT FOR 15 YEARS

(Rs. in millions)

Particulars	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
Opening Balance b/f	-	1.69	3.55	5.39	7.82	10.89	13.57	16.30	19.05	21.80	24.94	28.05	31.36	34.95	38.84
RECEIPTS:															
Society's capital	0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Term Loans	6.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sales Receipts	115.28	133.01	136.43	139.95	143.46	144.18	144.90	145.62	146.35	147.45	148.56	149.67	150.79	151.92	153.06
Misc. Receipts	0.40	0.41	0.42	0.43	0.44	0.44	0.44	0.44	0.44	0.44	0.45	0.45	0.45	0.45	0.45
C/o from Bank	40.00	48.70	47.00	45.40	42.20	40.40	37.70	34.90	32.20	29.50	26.70	23.80	20.60	17.10	13.50
TOTAL:	163.28	183.81	187.40	191.17	194.02	195.91	196.61	197.26	198.04	199.19	200.65	201.97	203.20	204.42	205.85
PAYMENTS:															
Fixed Assets	7.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Purchases	102.40	117.71	120.06	122.46	124.91	125.53	126.16	126.79	127.43	128.06	128.70	129.35	129.99	130.64	131.30
Manufacturing Exp.	6.16	7.15	7.42	7.69	8.01	8.17	8.33	8.50	8.67	8.84	9.02	9.20	9.38	9.57	9.76
Admn. Exp.	0.80	0.88	0.97	1.07	1.18	1.24	1.30	1.36	1.43	1.50	1.58	1.66	1.74	1.83	1.92
Marketing Exp.	1.67	1.99	2.09	2.20	2.31	2.37	2.43	2.49	2.55	2.61	2.68	2.75	2.82	2.89	2.96
Interest on T/L	0.76	0.76	0.76	0.70	0.63	0.57	0.51	0.44	0.38	0.31	0.25	0.19	0.12	0.06	-
Interest on C/c	2.20	2.68	2.59	2.50	2.32	2.22	2.07	1.92	1.77	1.62	1.47	1.31	1.13	0.94	0.74
Repayment of T/L	-	-	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.54	-
Repayment of C/c	40.00	48.70	47.00	45.40	42.20	40.40	37.70	34.90	32.20	29.50	26.70	23.80	20.60	17.10	13.50
Patronage rebate	-	0.13	0.18	0.25	0.33	0.42	0.41	0.41	0.41	0.41	0.54	0.59	0.63	0.67	0.72
Socio-Eco. Activities	0.13	0.18	0.25	0.25	0.33	0.42	0.41	0.41	0.41	0.41	0.54	0.59	0.63	0.67	0.72
Dividend Paid	-	0.18	0.25	0.25	0.33	0.42	0.41	0.41	0.41	0.41	0.54	0.59	0.63	0.67	0.72
TOTAL:	161.59	180.26	182.01	183.35	183.13	182.34	180.31	178.21	176.24	174.25	172.60	170.61	168.25	165.58	162.34
Closing Bal. C/f	1.69	3.55	5.39	7.82	10.89	13.57	16.30	19.05	21.80	24.94	28.05	31.36	34.95	38.84	43.51
Add. Dividend cumulative	-	0.13	0.31	0.56	0.89	1.31	1.72	2.13	2.54	2.95	3.40	3.99	4.62	5.29	6.01
Net Cash Intt on cumulative	1.69	3.68	5.70	8.38	11.78	12.26	14.58	16.92	19.26	21.99	24.65	27.37	30.33	33.55	37.50
Net Cash Intt. on p.a.	1.69	1.99	2.02	2.68	3.40	0.48	2.32	2.34	2.34	2.73	2.66	2.72	2.96	3.22	3.95
Assumptions															
Market Exp.															
sales receipts															
Purchase															
Manufacturing Exp.															
Admn. Exp.															

@ 2.5% p.a. from 6th year onwards

@ 0.5% p.a. from 6th to 9th year @ 0.75 from 10th year onwards

@ 0.5% p.a. from 6th year onwards

@ 2% p.a. from 6th year onwards

@ 5% p.a. from 6th year onwards

COMPUTATIONS FOR MEASURES OF INVESTMENT WORTH

Year	Profit	Dep.	Interest on term credit	Profit before Dep. and interest	Discount Factor @ 18%	Present Value @ 18%	Discount Factor @ 25%	Present value @ 25%	Discount Factor @ 30%	Present value @ 30%
	1	2	3	4	5	6	7	8	9	10
1.	1.26	0.43	0.76	2.45	0.8475	2.08	0.80	1.96	0.7692	1.88
2.	1.82	0.43	0.76	3.01	0.7182	2.16	0.64	1.93	0.5917	1.78
3.	2.53	0.43	0.76	3.72	0.6086	2.26	0.512	1.90	0.4552	1.69
4.	3.33	0.43	0.70	4.46	0.5158	2.30	0.4096	1.83	0.3501	1.56
5.	4.21	0.43	0.63	5.27	0.4371	2.30	0.3277	1.73	0.2693	1.42
6.	4.09	0.43	0.57	5.09	0.3704	1.89	0.2622	1.33	0.2072	1.05
7.	4.11	0.43	0.51	5.05	0.3139	1.59	0.2098	1.06	0.1594	0.80
8.	4.13	0.43	0.44	5.00	0.2660	1.30	0.1678	0.84	0.1226	0.61
9.	4.13	0.43	0.38	4.94	0.2255	1.11	0.1342	0.66	0.0943	0.47
10.	4.52	0.43	0.31	5.26	0.1911	1.01	0.1074	0.56	0.0725	0.38
11.	4.88	0.43	0.25	5.56	0.1619	0.94	0.0859	0.48	0.0558	0.31
12.	5.23	0.43	0.19	5.85	0.1372	0.80	0.0687	0.40	0.0429	0.25
13.	5.63	0.43	0.12	6.18	0.1163	0.72	0.0550	0.34	0.0330	0.20
14.	6.01	0.43	0.06	6.50	0.0985	0.64	0.0440	0.29	0.0254	0.17
15.	6.40+5.56*	0.43	0	12.39	0.0835	1.03	0.0352	0.43	0.0195	0.24
Total		6.45				22.13		15.74		12.81
Capital expenditure: New		7.60								
Existing		<u>4.41</u>								
1. Net present value @ 18%						-12.01		-12.01		-12.01
2. Benefit - cost ratio (PV/C) at 18% (22.13/7.60+4.41)						±10.12		+ 3.73		+ 0.90
3. IRR = 30 + 0.81/3.73-0.81/30-25 = 30 + 0.81/0.584						1.84				
4. Pay back period: (2.45+3.01+3.72+4.46 = 13.64 > 12.01)						30.4%				
						4 years				

*Salvage Value

DEBT SERVICE COVERAGE RATIO

(Rs. in millions)

Particulars	YEARS				
	1st year	2nd year	3rd year	4th year	5th year
Net profit	1.26	1.82	2.53	3.33	4.21
Add: Depreciation	0.43	0.43	0.43	0.43	0.43
Add: Interest on Term loan	0.76	0.76	0.76	0.70	0.63
Total:	2.45	3.01	3.72	4.46	5.27
Term loan Instalment	-	-	0.58	0.58	0.58
Interest on term loan	0.76	0.76	0.76	0.70	0.63
Total:	0.76	0.76	1.34	1.28	1.21
Debt Service coverage ratio	3.22	3.96	2.78	3.48	4.36

B.	ADMINISTRATION EXPENSES								
(a)	Administration salaries	0.50	0.55	0.61	0.67	0.74			
(b)	Other Office Expenses	0.30	0.33	0.36	0.40	0.44			
C.	MARKETING EXPENSES								
(a)	Packing expenses	1.20	1.43	1.50	1.58	1.66			
(b)	Selling expenses	0.47	0.56	0.59	0.62	0.65			
	Sub total (b)	111.03	127.73	130.54	133.42	136.41			
8.	Profit before interest and depreciation (c) ((a)-(b))	4.65	5.69	6.31	6.96	7.59			
9. (a)	Interest on Term Loan	0.76	0.76	0.76	0.70	0.63			
(b)	Interest on working capital	2.20	2.68	2.59	2.50	2.32			
(c)	Depreciation	0.43	0.43	0.43	0.43	0.43			
	Sub Total (d)	3.39	3.87	3.78	3.63	3.38			
10	Net Profit (c)-(d))	1.26	1.82	2.53	3.33	4.21			
11.	Appropriation of Profits								
(a)	Reserves & other funds (50%)	0.63	0.91	1.27	1.67	2.11			
(b)	Price fluctuation fund (20%)	0.24	0.37	0.51	0.67	0.84			
(c)	Dividends (10%)	0.13	0.18	0.25	0.33	0.42			
(d)	Other socio-economic activities (10%)	0.13	0.18	0.25	0.33	0.42			
(e)	Patronage rebate (10%)	0.13	0.18	0.25	0.33	0.42			

SENSITIVITY ANALYSIS

LINT COTTON YIELD DECLINES FROM 33% TO 32.5%, COTTON SEED YIELD REMAINS THE SAME AT 65% THUS SHORTAGE INCREASE FROM 2% TO 2.5%

Sl.	Value of Lint cotton	Decrease in the value of cotton lint $\left[(1) \times \frac{1}{66} \right]$	Profit before depreciation and interest term credit	Adjusted Profit before depr. and interest on term credit	Discount Factor @ 18%	Discounted Value @ 18%	Discount Factor @ 20%	Discounted value @ 20%
	1	2	3	4	5	6	7	8
1.	82.00	1.24	2.45	1.23	0.8475	1.04	0.8333	1.02
2.	95.01	1.43	3.01	1.58	0.7182	1.13	0.6944	1.10
3.	97.86	1.48	3.72	2.24	0.6086	1.36	0.5787	1.30
4.	100.80	1.52	4.46	2.90	0.5158	1.52	0.4823	1.42
5.	103.82	1.57	5.27	3.70	0.4371	1.62	0.4019	1.49
6.	104.34	1.58	5.09	3.51	0.3704	1.30	0.3349	1.18
7.	104.86	1.59	5.05	3.46	0.3139	1.09	0.2791	0.97
8.	105.39	1.60	5.00	3.40	0.2660	0.90	0.2326	0.79
9.	105.91	1.61	4.94	3.33	0.2255	0.68	0.1938	0.65
10.	106.70	1.62	5.26	3.64	0.1911	0.70	0.1615	0.59
11.	107.50	1.63	5.56	3.39	0.1619	0.64	0.1346	0.53
12.	108.31	1.64	5.85	4.21	0.1372	0.58	0.1122	0.47
13.	109.12	1.65	6.18	4.53	0.1163	0.53	0.0935	0.42
14.	109.94	1.67	6.50	4.83	0.0985	0.48	0.0779	0.38
15.	110.77	1.68	12.39	10.71	0.0835	0.89	0.0649	0.70
Total						1446		13.01

Capital expenditure

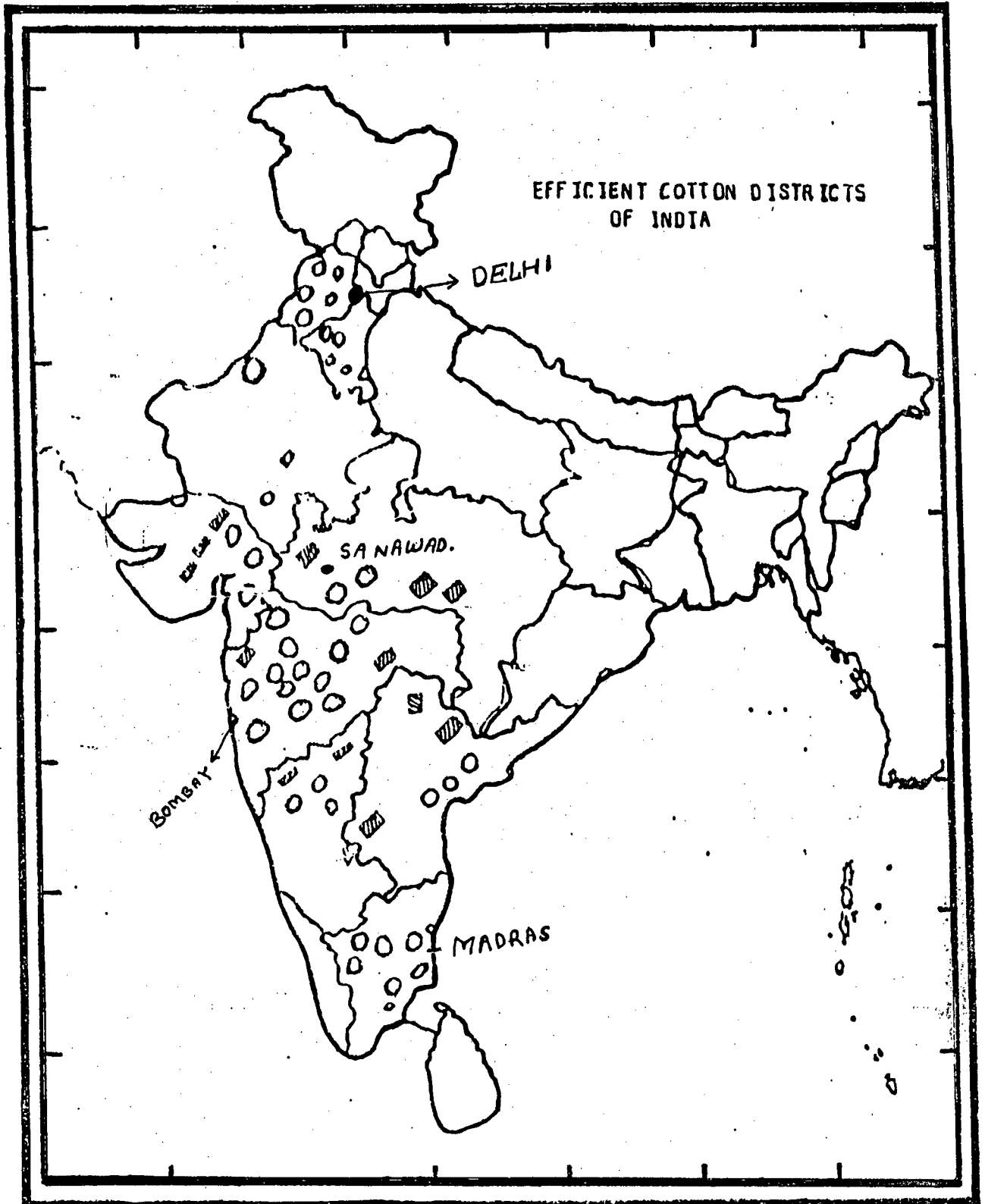
NPV @ 18%

BCR @ 18% $\left[\frac{PV}{C} \right]$

Pay back

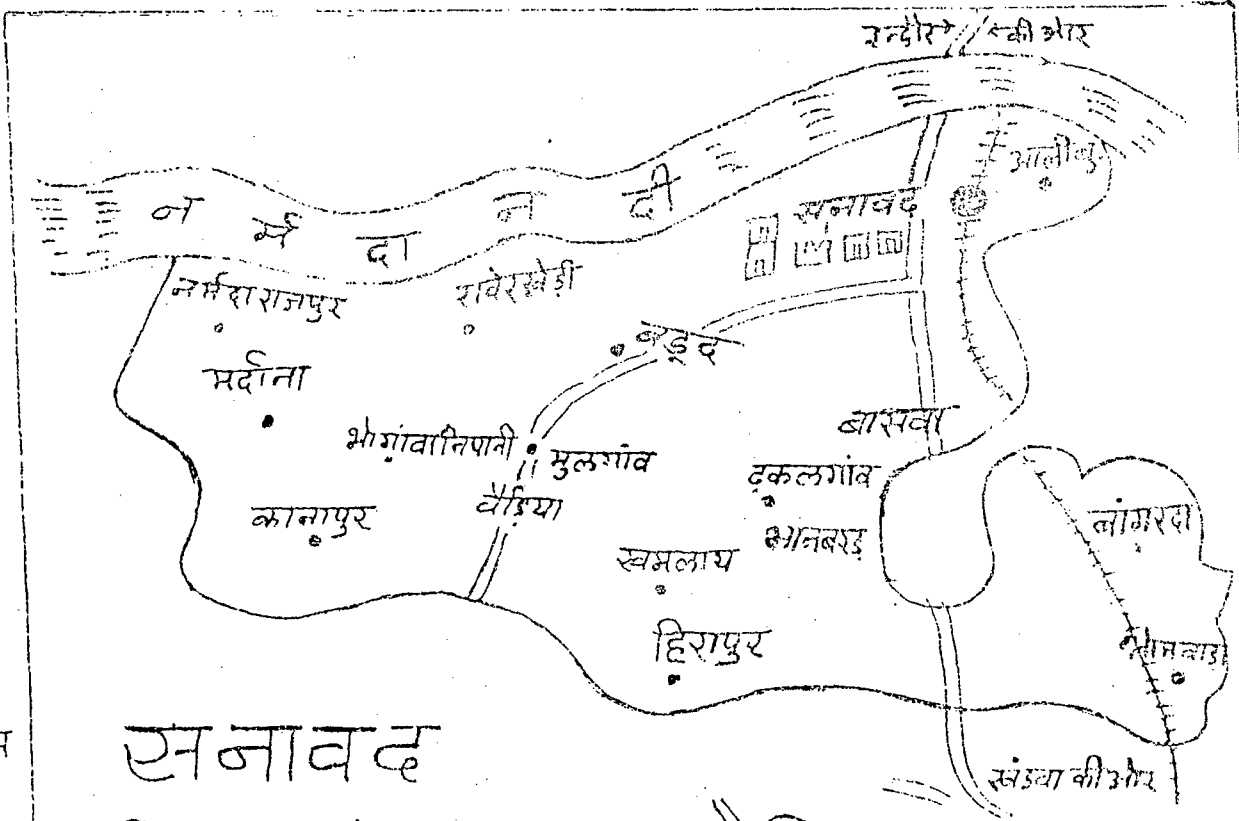
$$IRR = 20 + \left[\frac{1.00}{2.45 - 1.00} \right] \left[\frac{1.00}{0.725} \right] = 20 + \left[\frac{1.00}{0.725} \right] = 21.4\%$$

13.01
-12.01
2.45
1.20
6 years



- Most Efficient Cotton Districts
- ▨ Next Most Efficient Cotton Districts

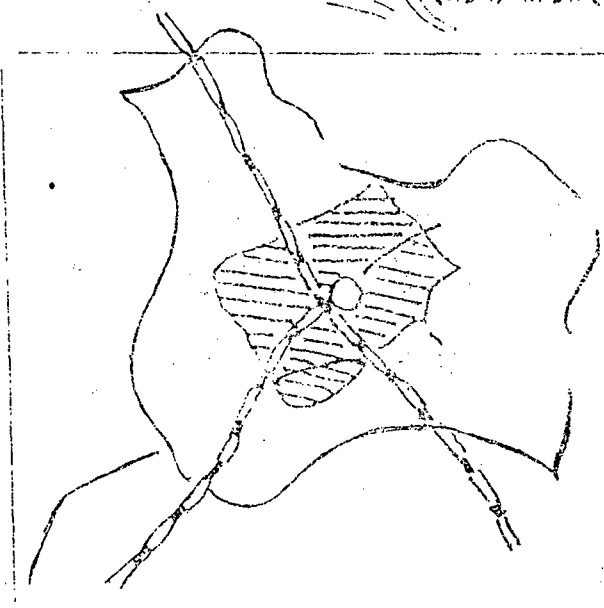
→ उत्तर ←



↓
पश्चिम
↑

↓
पु०
↑

सोनावद
जिला खरगोन
(मध्य-प्रदेश)
... भारत ...



→ दक्षिण ←

**POSITION OF MEMBERSHIP AND OWNED FUNDS OF
SANAWAD COOPERATIVE SOCIETY**

Classification	Membership No.			Funds in Rs.		
	1987-88	1988-89	1989-90	1987-88	1988-89	1988-89
a) Individuals of which						
i) Agriculturists	935	941	952	89990	90740	184880
ii) Non Agriculturists	-	-	-	-	-	-
b) Primary Agricultural Co-op. Societies Including Lamps/PSS	18	18	18	208225	208225	208225
c) Other Societies	-	-	-	-	-	-
d) State Govt.	1	1	1	709675	1094675	927875
e) Nominal Member	29	30	30	801	826	826
f) Other if any	-	-	-	-	-	-
	983	990	1001	1008691	1394466	1321806

ANNEXURE-14**STATEMENT OF VILLAGE LEVEL COOP. SERVICE SOCIETIES
THE SANAWAD COOPERATIVE MARKETING SOCIETY LTD., SANAWAD**

	Name of the society		No. of Members
1.	Cooperative Service Society,	Badud	1031
2.	-do-	Bangrdo	793
3.	-do-	Basaw	1064
4.	-do-	Dhakalgaon	1005
5.	-do-	Aujurg	974
6.	-do-	Khamlay	887
7.	-do-	Bhomaha	494
8.	-do-	Rajpura	563
9.	-do-	Bhanbard	1200
10.	-do-	Mardana	900
11.	-do-	Kanapur	1200
12.	-do-	Baidiya	2260
13.	-do-	Raverkheri	1022
14.	-do-	Bhopal-Nipani	809
15.	-do-	Bhulgaon	1027
16.	-do-	Hirapur	700
TOTAL MEMBER:			15929

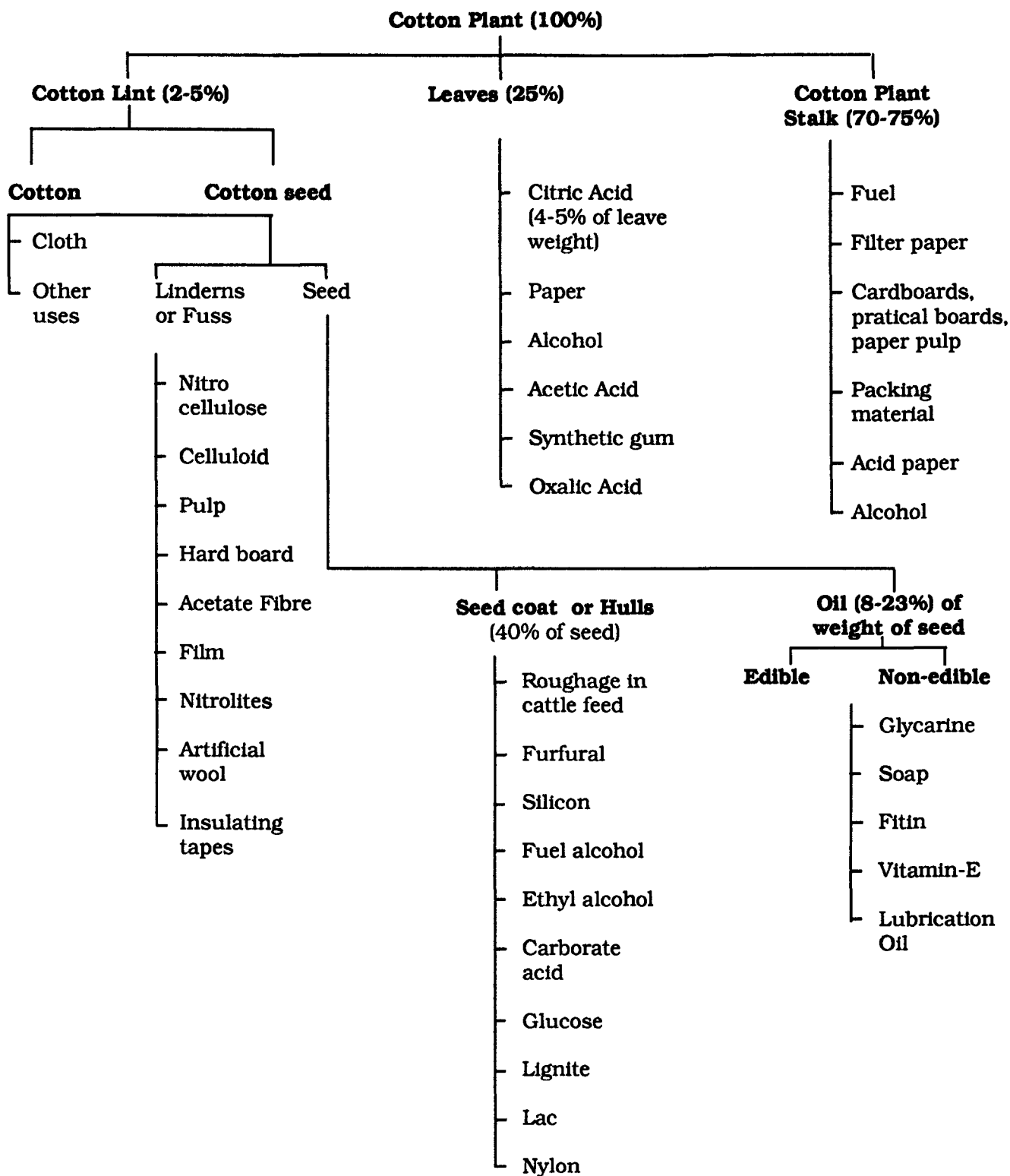
STATEMENT OF GINNING & PRESSING OF THE SANAWAD COOP. MARKETING SOCIETY LIMITED, SANAWAD FOR THE LAST FIVE YEARS.

Year	Working days	Capacity of ginning in Qntls	Ginned Seed cotton	percentage	Pressing capacity	Bales pressed	% of pressing utilisation
1	2	3	4	5	6	7	8
1985-86	120	60000	44138	74%	18000 bales	12701	70.56%
1986-87	120	60000	63806	106%	18000 "	19805	110.02%
1987-88	120	60000	66958	111%	18000 "	23152	128.62%
1988-89	120	77000	55719	72%	25000 "	16210	64.84%
1989-90	120	77000	74330	96%	25000 "	26948	107.92%

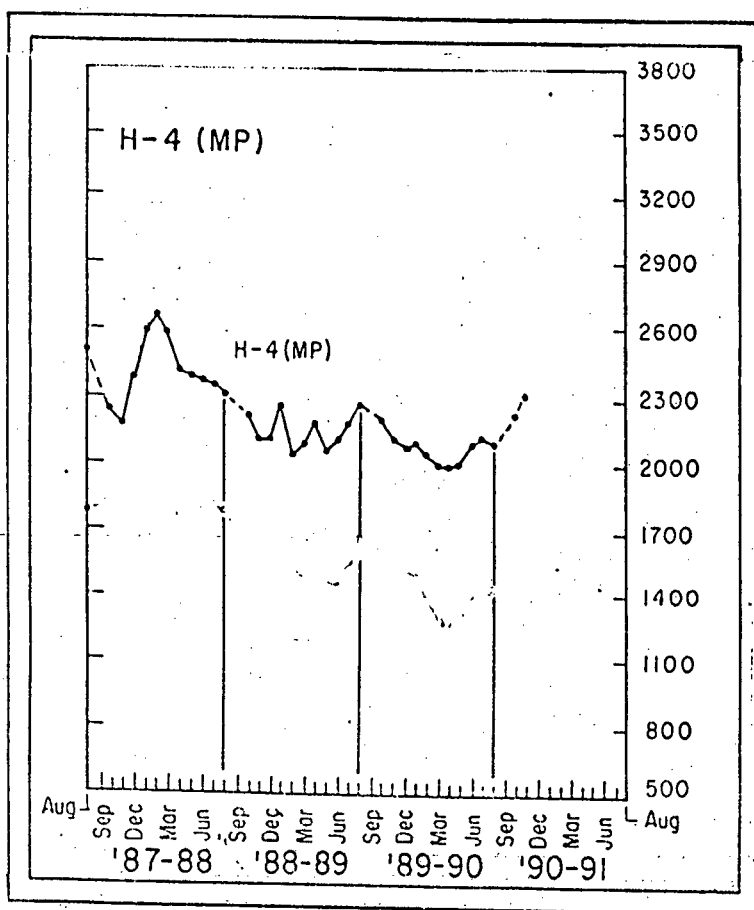
IMPORTANT VARIETIES OF COTTON GROWN IN INDIA

Sl. No.	Variety	Basic Staple length(2.5%) span length	Micronnaire value
1.	Bengal Deshi	-	6.8 - 7.2
2.	Wagad	20 mm	5.5 - 6.0
3.	V-797	22 mm	4.2 - 4.8
4.	Jayadhar	22 - 23 mm	5.0 - 5.6
5.	Laxmi	23 mm	3.6 - 4.0
6.	J-34/Bikaner Narma	23 mm	3.6 - 4.4
7.	G Cot 12	23.5 mm	4.2 - 5.0
8.	AK/Y-1	24 mm	4.8 - 5.2
9.	F-414/H-777/Agetti	24 - 25 mm	3.8 - 4.2
10.	Digvijay 'A' Guj.	25 mm	4.0 - 4.5
11.	A-51/9(Narmada)	24.5-25 mm	3.8 - 4.2
12.	L-147/AHH-468	25 - 26 mm	3.8 - 4.2
13.	1007	27 mm	3.7 - 4.0
14.	LRA - 5166	27 mm	4.0 - 4.5
15.	Varalaxmi (Mah.)	23-34.5 mm	3.0 - 3.5
16.	JKHY - 1	30 mm	3.8 - 4.2
17.	H-4	30 mm	3.6 - 4.2
18.	Sankar - 6 (Sau.)	28-29 mm	3.7 - 4.2
19.	Sankar - 6 (Guj.)	30 mm	3.7 - 4.2
20.	MCU 5 (South)	33 mm	3.0 - 3.5
21.	DHC-32 (M.P.)	33-34.5 mm	3.0 - 3.3
22.	DHC-32 (Mah.)	34.5 mm	3.0 - 3.2
23.	DHC-32 (South)	39 mm	3.0 - 3.5
24.	Suvin	40 mm	3.2 - 3.6

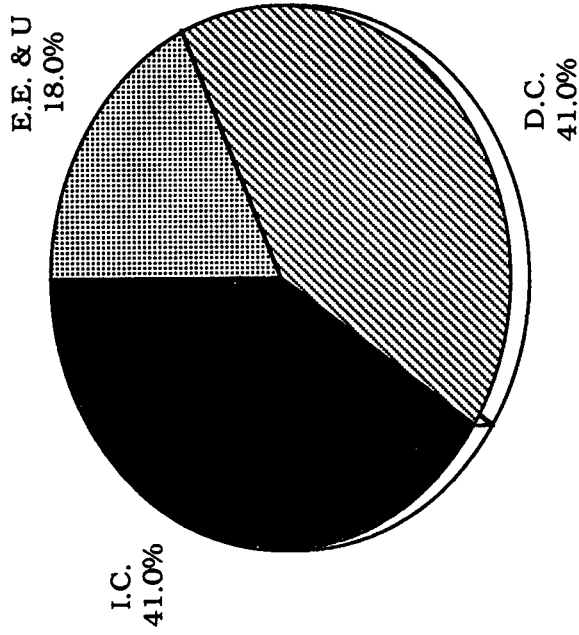
COTTON PRODUCT AND BY-PRODUCT SYSTEM



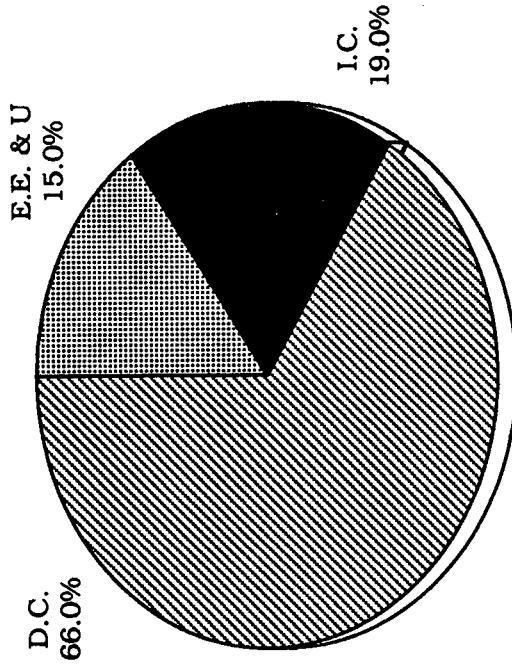
**PRICES OF SELECTED VARIETY OF COTTON H4 (M.P.)
DURING THE FOUR SEASONS (SEP-AUG) • RUPEES PER QUINTAL**



MILL CONSUMPTION OF COTTON



1960



1988

I.C. = INDUSTRIAL COUNTRIES

D.C. = DEVELOPING COUNTRIES

E.E. & U = E. EUROPE & U.S.S.R.

Fifth ICA/Japan Training Course for
Strengthening Management of
Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: Red Pepper Powder Plant Project
<i>COUNTRY</i>	: Republic of Korea
<i>PROJECT PREPARED BY</i>	: Kie-Yup Shin

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

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ACKNOWLEDGEMENTS

The Fifth ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia has provided me with an opportunity to learn the agricultural cooperative movement in South-east Asian countries and integrated management of agricultural cooperatives.

The Red Pepper Powder Plant Project in Eumseong County was prepared under this programme.

I would like to extend my gratitude to Mr.M.V.Madane, Project Director of ICA, other staffs of ICA, and professors of IIMA, who guided and helped me kindly.

Also I am grateful to the staffs of NACF for giving me a chance to participate in this Training Course.

Seoul, Feb. 1991

Kie-Yup Shin

CHAPTER I. SUMMARY

1. The Project is to set up a red pepper powder plant of a yearly capacity of 900 metric tonnes in Eumseong County, aiming at increasing farmers' income in the area.

2. Farmers have suffered from unstable prices of red pepper and wanted the agricultural cooperatives to procure their produce at remunerative and stable prices.

3. The red pepper powder industry in Korea has been underdeveloped and consumers have been eager for reliable and quality products of red pepper powder.

4. The Plant will be established and run as an affiliated company by NACF and PACs in the area. It will procure raw red pepper from farmer members and produce quality products of red pepper powder guaranteed by Korean Industrial Standard.

5. Total capital investment for implementing the Project will amount to 2,625 million Won and be financed by NACF and PACs jointly. It will take one year to construction the Plant.

6. The operating rate of the Plant will increase to 122 percent in fourth operating year step by step from 100 percent in the first operating year.

7. The Project is supposed to have financial viability during the Project period, 9 years inclusive of construction period. Net Present Value, at a discount rate of 13 percent, is estimated to be 3333 million Won, and benefit-cost ratio to be 1.8. Internal rate of returns is enumerated to be about 18 percent, which is much higher than capital cost of investment, 13 percent.

CHAPTER II. BACKGROUND

2.1. OVERALL SITUATION

Red pepper is a kind of spices, indispensable in Korean food. The annual production of red pepper amounts to about 150 thousand metric tonnes on an average. The relative share of red pepper in total agricultural production is more than 5 percent in terms of value.

Per capita consumption of red pepper is estimated to be 2 kilo gram per year. About 80 percent of red pepper is consumed in the form of red pepper powder. But red pepper powder industry has still not been developed in Korea. Only 20 percent of its consumption volume is marketed in the form of powder by small traders and a few of private processing companies.

Furthermore most consumers believe that the products available in the market are not reliable to be genuine. They are willing to buy quality products of red pepper powder even at rather higher prices. And they usually purchase red pepper itself and process it into powder at the traditional small-scale mills.

Therefore an entry to red pepper powder industry with improved and reliable technology will be very perspective.

Though red pepper is one of the main sources of farmers' income, farmers sometimes suffer from its price fluctuation that is caused by the variation of yield and the seasonality of production. To overcome this problem, Agricultural Cooperatives are asked to set up the processing plants of red pepper powder and procure farmers' produce at remunerative and stable prices.

2.2. AREA OF PROJECT

The area of the Project is Eumseong County in Chungbuk Province, which is famous for main producing area and it is located near Seoul City, the largest consuming area.

There are County Office of NACF and 9 Primary Agricultural Cooperative Societies in the Project area.

2.3. PROBLEMS FACED BY FARMERS

Farmers have difficulties in securing stable price of red pepper because the sharp fluctuation of its price occurs frequently year by year.

Most farmers sell almost all of their produce to private traders in harvest season at the price offered by traders because they have not sufficient storage facilities of their own. Usually farmers are not satisfied with the prices received from traders.

2.5. NEEDS AND JUSTIFICATION OF THE PROJECT

Farmers want to sell their produce to the PACs at stable and better prices. Agricultural Cooperatives can contribute to increase farmers' income, when they set up a plant of red pepper powder and procure raw red pepper from their farmer members at a better and stable prices.

Furthermore the procurement will make the marketing volume of red pepper to traders reduce and hence secure the market prices rather stable. Also it is expected that value addition come from processing red pepper will be returned to the farmer members.

CHAPTER III. RED PEPPER POWDER PLANT IN EUMSEONG COUNTY

3.1. OBJECTIVES

The main objective of the Project is to increase farmers' income in the Project area. It can be achieved through

- 1) stabilizing the market prices of red pepper in harvest season by procuring farmers' produce
- 2) guaranteeing better procurement prices to the farmers
- 3) returning value addition from vertical integration to the farmers.

Also it aims at securing market share of Agricultural Cooperatives in the industry of red pepper powder, which will help other agricultural cooperatives with entry in the industry.

3.2. AREA OF OPERATION

The Project will be located in Eumseong County near Seoul City, the main consuming area. There is express way near the area. Thus it is a good location to save transportation cost.

Also the area is one of the main producing area of red pepper and hence it is available to collect raw material easily. The

area is well arranged with electricity facilities and water supply.

3.3. PROJECT COMPONENT

1. Implementation of the Project

The Project will be implemented by NACF in collaboration with Primary Agricultural Cooperatives in the area. It is desirable to establish an affiliated company which is owned jointly by NACF and PACs in the area.

2. Construction of the Plant

It needs one year and 2.6 billion Won to set up a plant of a capacity of 3 metric tonnes of red pepper powder per day. Manufacturing facilities including machinery can be available in the country.

3. Procurement of raw material

Raw red pepper will be procured through PACs in the area. Red pepper is produced at one crop seasonally in a year and most

farmers have no storage facilities of their own. So the Plant should procure most of the raw material requirement during a short period and it requires a large amount of working capital.

Procurement prices will be the average level of previous five years. It will guarantee the farmers to get remunerative prices, because market prices in the harvest season is usually lower than average prices throughout a year.

4. Processing of red pepper powder

The Plant is going to process raw red pepper of 5 metric tonnes per day of 8 working hours. The Plant will be operated overtime during busy season. A new and improved manufacturing technology will be adopted and thus the final products in the Plant will be the best quality products guaranteed by Korean Industrial Standard.

5. Marketing of final products

Supermarkets and chainstores of NACF and PACs will be outlets of final products. Private marketing channels will be also utilized for marketing red pepper powder made from the Plant.

Advertisement is important to extend market share in red pepper powder industry.

Selling prices of final products will be determined on the basis of procurement price of raw material and market situation. It is expected that consumers will prefer quality products even at high prices.

CHAPTER IV. DETAILS OF THE PROJECT

4.1. CAPACITY OF THE PLANT

The capacity of the Plant will be 5 tons of processing raw red pepper per day of 8 working hours. The recovery rate is supposed to be 60-65 percent. Therefore the Plant will produce about 3 tons of red pepper powder. That means the Plant can produce around 900 tons of final product per year of 300 working days.

4.2. QUALITY STANDARD OF THE PRODUCT

The quality standard of red pepper powder product, produced from the Project, will be based on the Korean Industrial Standard stipulated by Korean Government. None of existing 10 private companies producing red pepper powder, have been licensed the quality standard of KIS, because the manufacturing process of them is not modernized.

The Korean Food Development Institution, established by the Government, has been executing the study of the development of processing technology and design of manufacturing process for red pepper powder, sponsored by NACF since 1989. Thus the advanced technology can be exclusively adopted in the Project with help of NACF. Being more sanitary, the new products of the Plant will be expected to easily access to consumers. And two types of final products, 500 gram and 5 kilogram, will be produced in the Plant at the same proportion.

4.3. MANUFACTURING PROCESS

The improved manufacturing process of red pepper powder consists of raw material loading, separation, impurities cleaning, calyx cutting, drying cools, moisture control, sterilizing and packing. These process will be designed to be conducted through factory automation.

Compared with the conventional one, the improved process of manufacturing red pepper powder has several merits such as saving of labor requirement, improvement of operation efficiency and quality standard etc. The manufacturing processes of the conventional and improved one are shown in details in Appendix.

4.4. PROCUREMENT OF RAW RED PEPPER

Raw material is available in the Project area. Requirement of raw red pepper at operation rate of 100 percent is 1500 metric tonnes, while production of red pepper amounts to 3300 metric tonnes in the Project area.

A problem is expected to arise from allotment of procurement quantity among farmers. The reason is that farmers will compete with each other in selling their produce to the Plant at better prices offered by the Plant.

Board of Directors will give guidelines for settling this problem and the PACs will allot the procurement quantity to the farming groups at village level on reasonable basis, such as

CHAPTER V. ORGANIZATION AND MANAGEMENT

5.1. MANAGEMENT POLICY

NACF will implement the Project in collaboration with Primary Agricultural Cooperatives in Eunseong County. The plant will be set up and run as an affiliated company invested and owned jointly by NACF and PACs.

Therefore management policies will be made by Board of Directors which will be composed of representatives from NACF and PACs. The Processing Department of NACF Headquarter will assist the preparation and construction of the Plant.

5.2. CLASSIFICATION OF MANAGEMENT

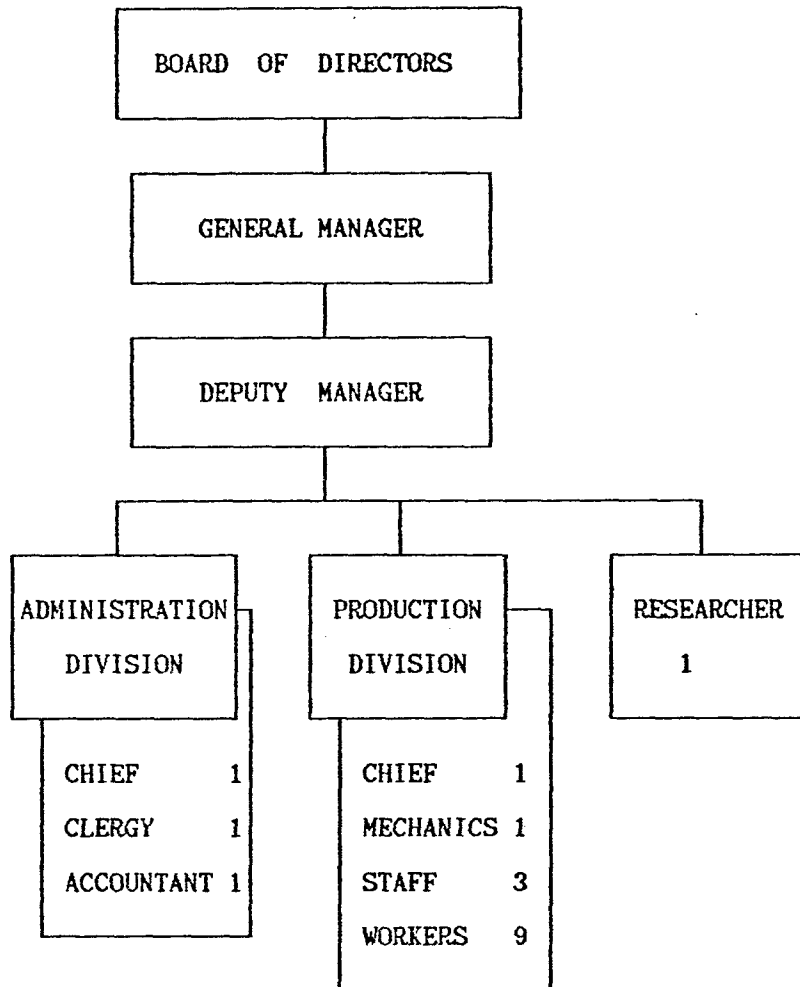
The management of the plant can be classified as follows.

- 1) Administration and General affairs
- 2) Accounting and Financing
- 3) Procurement of raw material
- 4) Production and Marketing of final products
- 5) Maintenance of machinery and equipment

5.3. GENERAL MANAGER

The general manager will be nominated by Board of Directors and vested with all management as per the basic policies given by Board of Directors.

5.4. ORGANIZATIONAL CHART



production capacity. The production situation of red pepper in different society area is given in Appendix 2.

4.5. MARKETING OF THE FINAL PRODUCTS

The final products will be marketed nationwide through various channels. 10 supermarkets of NACF and in the large city area and 1,934 chainstores of PACs in all over rural and urban area will be utilized as the outlets. And they will be sold at private supermarkets and chainstores all over the country.

It is to be emphasized that the superiority of the product quality, guaranteed by the KIS, should be advertised through various mass media such as newspapers, TV etc.

Agricultural Cooperatives has already retained their name value of reliability to the public consumers in Korea. Consumers will prefer quality product of red pepper powder even at rather high prices. Therefore it is expected that there is no problem in marketing of red pepper powder made in the Plant.

4.6. SCHEDULE OF CONSTRUCTION OF THE PLANT

It will take about 1 year to set up the red pepper powder plant. NACF will organize task forces for preparing and executing the construction of the Plant. Their tasks are as follows.

- 1) Purchase of land
- 2) Working-out the detailed plan

- 3) Recruiting of the staffs and wokers
- 4) Ordering and erecting of machinery and equipment
- 5) Civil work for construction
- 6) Test run

4.7. PRODUCTION PLAN FOR 8 YEARS

Production plan, based on the capacity of the Plant and market situation, is supposed to be as follows.

Year	1	2	3	4	5	6	7	8
Procurement	1500	1600	1700	1800	1800	1800	1800	1800
Production (M/T)	975	1040	1105	1170	1170	1170	1170	1170
Operating Rate (%)	100	107	113	120	120	120	120	120
Recovery Rate (%)	65	65	65	65	65	65	65	65

5.5. TASKS OF DIVISIONS

1. PRODUCTION DIVISION

The Chief of production division will be in charge of production of red pepper powder. He will look after process of work, production schedule, utilization of capacity, quality control, maintenance of machinery, procurement of raw material and marketing of final products with help of 4 staffs and 9 workers.

2. ADMINISTRATION DIVISION

The Chief of administration will be in charge of accounting, financing, administration and other general affairs.

5.6. ORGANIZATION OF FARMERS' GROUPS

The horizontal integration of farmers' groups will be needed in order to not only make quality control of raw material, but also allotment of procurement quantity.

The quality of red pepper is essential for enhancing the quality of red pepper powder. Also the fair allotment of procurement is required for the better participation of farmers to their primary societies.

Fortunately there have been organized 254 farming groups at

village level in the Project area. The guidance staffs of County Office of NACF and PACs will give assistance to make the horizontal integration effective for the Project implementation.

CHAPTER VI. FINANCIAL ANALYSIS

6.1. BASIC ASSUMPTIONS

1) Project period is 9 years, including 1 year of construction.

2) Depreciation is conducted by straight line method. Salvage value is assumed to be 10 percent of cost. Service life of various fixed assets are 40 years for buildings, 8 years for machineries, 20 years for structions, 5 years for vehcles and 4 years for other fixed assets respectively.

3) Recovery rate is assumed to be 65 percent throughout Project period.

4) Procurement prices of raw material are supposed to be 3077 Won per kilogram, which is the average farmgate prices during the period from 1986 to 1990.

Year	1986	1987	1988	1989	1990	Average
Price	3263	3932	3298	1672	3218	3077

(Won/kg)

5) Selling prices of final products, red pepper powder, will be at a prices of 6500 Won per kilogram, which is as high as those of private company products at the wholesale market prices.

6) Corporation tax will be imposed at a rate of 10.75 percent of gross profit of the Plant.

6.2. CAPITAL INVESTMENT OF THE PROJECT

The capital investment of the Project is estimated to be 2,625 million Won, on the basis of 1990 current prices.

Item	Land	Building	Machinery	Others	Total
Cost	1,064	780	630	150	2,625

The amount of investment cost required for the Project will be financed by NACF and PACs, and term loan from Government. The capital cost of the total investment, which will be used as the discount rate in the financial analysis, is assumed to be 13 percent per annum, which covers the weighted average cost of the three sources of capital investment.

Sources of Funds	Amount in thou. Won	Interest Rate
NACF	1,200,000	12.5 percent
PACs	1,075,000	14.0 percent
Gov't Term Loan	350,000	8.0 percent
Total	2,625,000	12.5 percent

6.3. WORKING CAPITAL

Total amount of working capital requirement will amount to 2,818,987 thousand Won for the first year at an operating rate of 100 percent. It will increase annually as the operating rate goes up as follows. The details of annual working capital requirement is shown in Appendix 10 .

The working capital will be financed by NACF at an interest rate of 12.5 percent per annum and by PACs at 14.0 percent in the same proportion respectively. Working capital requirement and its interest payment are estimated in the Project period as follows.

(in million Won)

Year	1	2	3	4	5	6	7	8
Working capital	2819	3002	3185	3368	3368	3368	3368	3368
Interest on W.C.	338	360	383	404	404	404	404	404

6.4. PRODUCTION COST

Production cost, the sum of fixed cost and variable cost, is calculated annually as belows. The details of those are shown in Appendix 7 , 8 and 9 .

(in million Won)

Year	1	2	3	4 onward
Fixed cost	444	444	444	444
Variable cost	5,269	5,620	5,970	6,321
Total cost	5,713	6,064	6,414	6,765

6.5. CASH FLOW

The annual cash flow from the Project is estimated as follows. The details is given in Appendix 11 and 12 .

(in million Won)

Year	0	1	2	3	4
Cash inflow	0	6388	6760	7183	7605
Cash outflow	2625	5570	5921	6271	6622
Net cash inflow	- 2625	768	839	912	983
Present Value	- 2625	620	598	575	548

Year	5	6	7	8
Cash inflow	7605	7605	7605	8240
Cash outflow	6622	6622	6622	6622
Net cash inflow	983	983	983	1618
Present Value	485	429	380	575

* NPV = 1,585 million Won

* BCR = 1.6

* Discounted Payback Period = 4 Years

6.6. IRR (Internal rate of returns)

IRR in the Project is calculated to be approximately 18 percent, which is much higher than the capital cost of initial investment, that is 13 percent.

NPV at 13 % of discount rate : 1,585

NPV at 30 % of discount rate : 189

$$\begin{aligned} \text{IRR} &= 13.0 + 17.0 * (1585 + 189) / 1585 \\ &= 28.2 \% \end{aligned}$$

6.7. BREAK EVEN ANALYSYS

$$\begin{aligned} \text{B.E.Q.} &= \frac{\text{Total fixed cost}}{\text{Unit price} - \text{Average variable cost}} \\ &= 405 \text{ M/T} \end{aligned}$$

6.8. SENSITIVITY ANALYSIS

Assumptions	NPV
Changes in raw material price	
10 % increase	- 811
5 % increase	447
Changes in final products price	
10 % decrease	-1450
5 % decrease	47
Changes in recovery rate	
5 % decrease	- 747
1 % decrease	1134

6.9. FINANCIAL VIABILITY

On the basis of the above financial analysis , the Project is to be said to be financially viable.

CHAPTER VI. BUDGET

The budget for first five operating years is estimated as belows.

(in million Won)

Item	Operating Year				
	1	2	3	4	5
1. Revenue	6338	6760	7183	7605	7605
2. Expense	5570	5921	6271	6622	6622
3. Gross Income	768	839	912	983	983
4. Interest on Term Loan	280	280	240	200	160
5. Tax	67	75	83	90	90
6. Net Income	421	484	589	693	733

CHAPTER VI. BENIFITS OF THE PROJECT AND RECOMMENDATIONS

8.1. BENIFITS OF THE PROJECT

Member farmers can get more income through selling red pepper to the Plant at higher prices than those offerd by private traders.

The indirect benifits are that the market prices of red pepper will go up , because the procurement of red pepper of the plant will reduce marketing volume of red pepper in the area , especially in the harvest season.

The value addition from the vertical integration will be returned to the farmer members.

8.2. RECOMMENDATIONS

The financial viability is sensitive to the change in prices of red pepper. Therefore the selling prices of red pepper powder are to be determined in the relation to the prices of raw red pepper.

Quality control of raw material is to be checked carefully , because it is closely related to the recovery rate , which gives serious impact on financial viability. Horizontal integration between the farming groups in the village level will contribute to the improvement of quality of raw red pepper.

The red pepper powder industry is underdeveloped and thus the quality product of the Plant will contribute to increase market share of agricultural cooperatives in the industry. And it can be suggested that agricultural cooperatives in other region will enter in the red pepper powder industry.

Appendix 1. Production of Red Pepper in Korea

Year	Cultivated Area (hectare)	Yield (kg / ha)	Production (M / T)
1980	132,703	940	125,056
1981	151,037	910	137,575
1982	113,368	1,150	130,465
1983	122,188	1,590	194,184
1984	99,796	1,170	116,910
1985	117,877	1,400	165,277
1986	128,963	1,530	197,804
1987	88,975	1,550	137,924
1988	97,406	2,150	208,973
1989	71,672	2,070	148,683

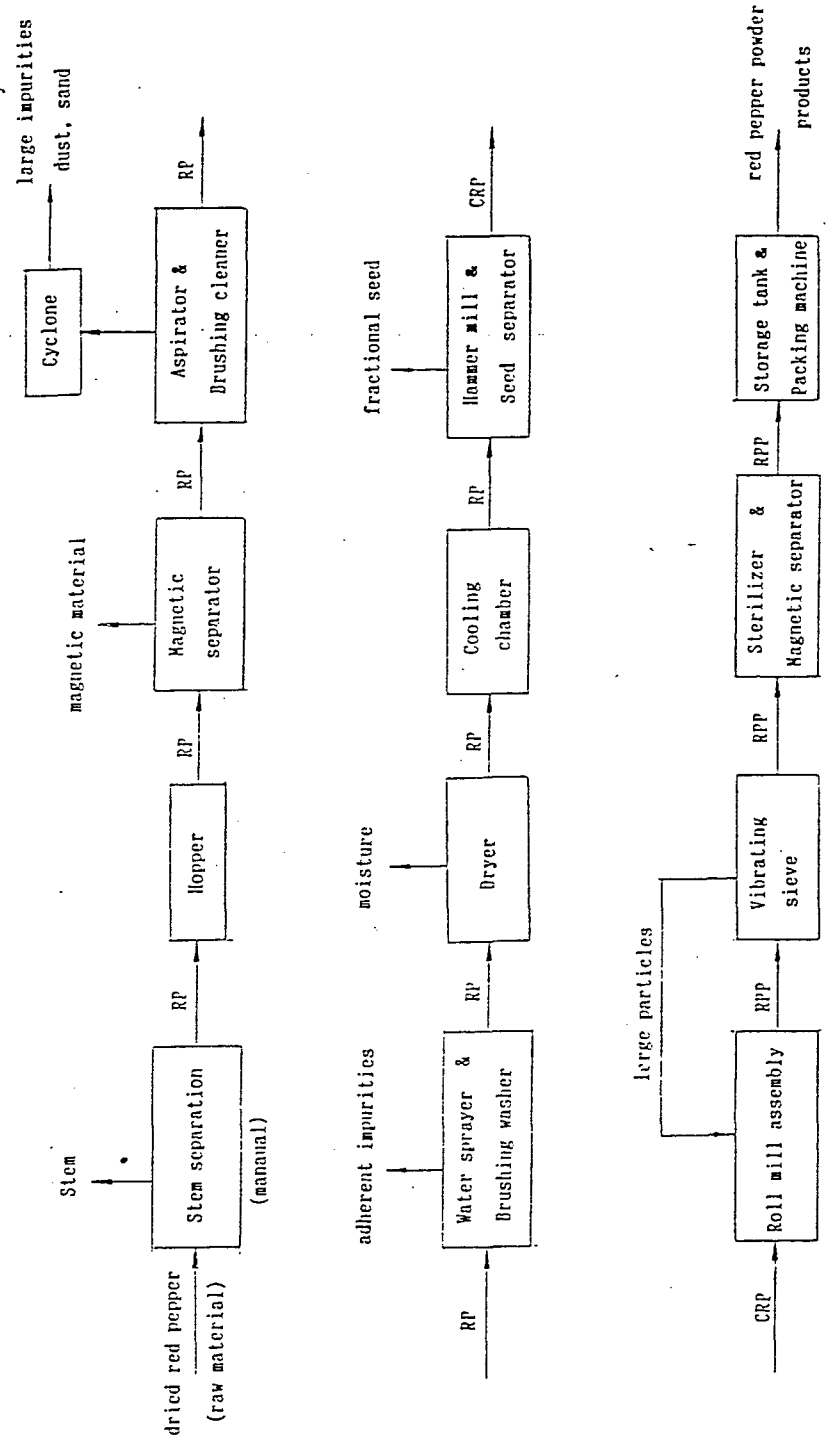
Source : MAFF, Yearbook of Agriculture, Forestry and Fishery

Appendix 2. General Situation of Project Area, Eumseong County, 1989

Township	Red Pepper Harvest Area (ha)	Red Pepper Production (M/T)	Number of Farmhousehold (No.)	Number of Red Pepper Farmers (No.)
Eumseong	232	453	1,998	1,702
Kumwang	319	624	2,115	1,961
Soi	106	208	1,335	1,122
Wonnae	186	364	1,443	1,366
Mangdong	156	305	879	849
Daeso	236	461	1,537	1,431
Samseong	294	574	1,651	1,584
Sangkuk	110	215	1,229	1,083
Kangok	58	114	1,578	1,047
Total	1,697	3,318	13,765	12,145

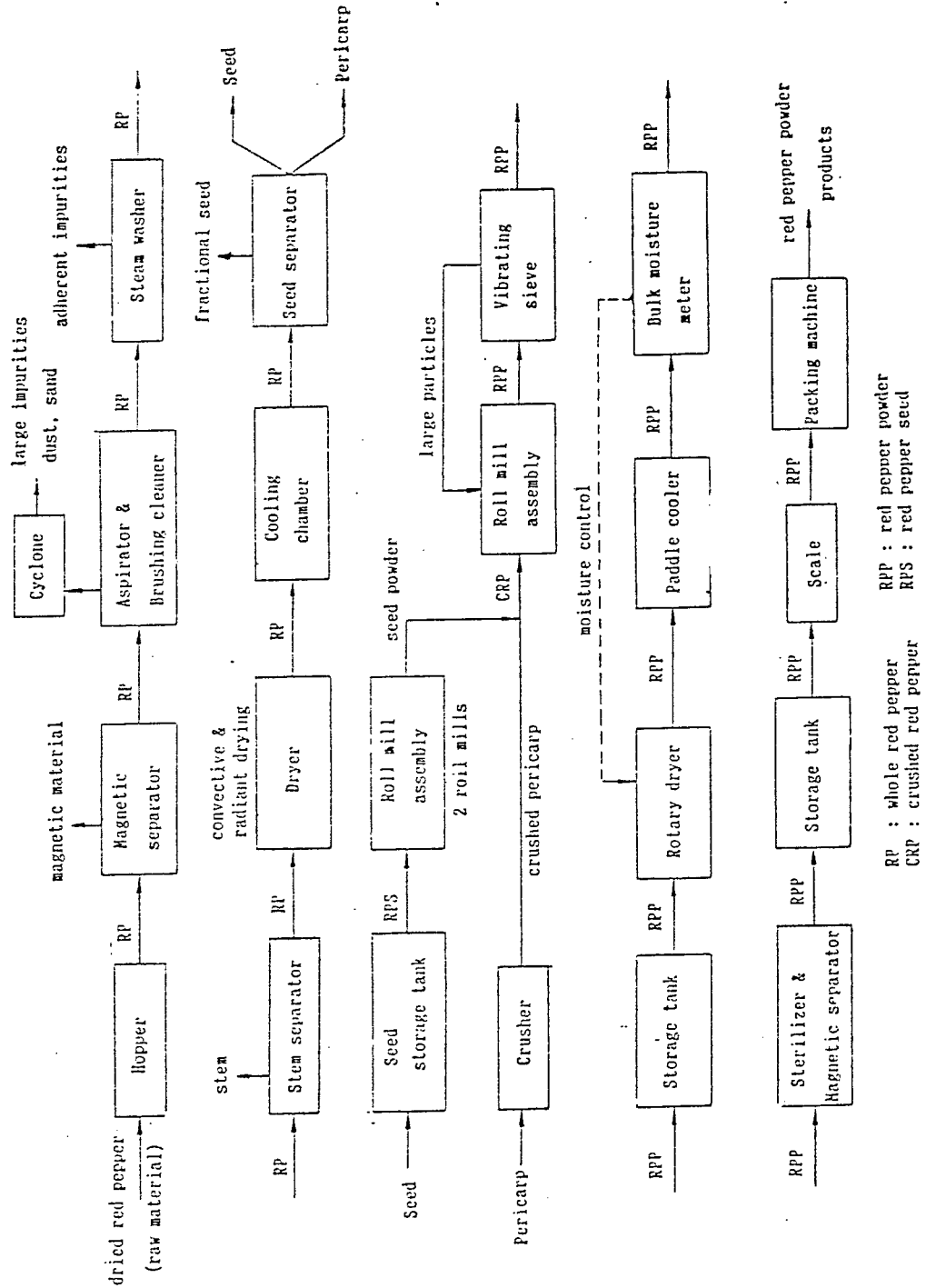
Source : Eumseong County Office of NACF

Appendix 3. Manufacturing Process of Conventional Red Pepper Powder Plant

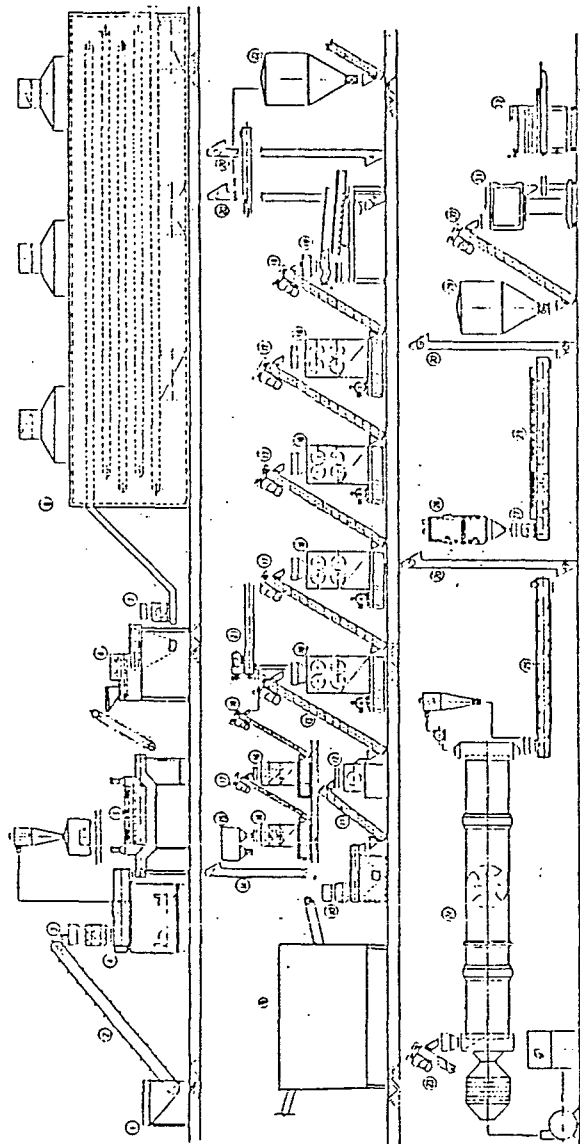


RP : whole red pepper
 CRP : crushed red pepper
 RPP : red pepper powder

Appendix 4. Manufacturing Process of Improved Red Pepper Powder Plant



Appendix 5. Machine Layout of Improved
Red Pepper Powder Plant



- | | | |
|---------------------|-------------------------|-----------------------------|
| 1. Hopper | 2. Belt conveyor | 3. Magnetic separator |
| 4. Brushing cleaner | 5. steam washer | 6. Automatic stem separator |
| 7. Slicer | 8. Band dryer | 9. Cooling chamber |
| 10. Seed separator | 11. Screw conveyor | 12. Crusher |
| 13. Screw conveyor | 14. Bucket elevator | 15. Seed storage tank |
| 16. Roll mill | 17. Screw conveyor | 18. Screw conveyor |
| 19. Vibrating sieve | 20. Bucket elevator | 21. Screw conveyor |
| 22. Storage tank | 23. Screw conveyor | 24. Rotary dryer |
| 25. Paddle cooler | 26. Bulk moisture meter | 27. Magnetic separator |
| 28. Sterilizer | 29. Storage tank | 30. Screw conveyor |
| 31. Automatic scale | 32. Packing machine | |

Appendix 6. Depreciation

(in thousand Won, year)

Item	Investment Cost	Service Life	Salvage Value	Annual Depreciation
Buildings	780,000	40	78,000	17,550
Machineries	630,000	8	63,000	70,875
Construction	30,000	20	3,000	1,350
Vehicles	25,000	5	2,500	4,500
Others	95,020	4	9,502	21,380
Total	1,560,020		156,002	115,655

Appendix 7. Fixed Cost

(in thousand Won)

Item	Amount	Remarks
Salary	137,972	General Manager 23,855
		Deputy Manager 19,845
		Manager (3) 29,634
		Researcher 9,057
		Clergy 8,082
		Marketing 8,082
		Mechanics (3) 32,376
		Accountant 7,041
Depreciation	115,655	
Interest on Term Loan	28,000	350,000 * 12 %
Basic Charge of Electricity	17,100	500 Kw * 2,850 * 12 months
Telephone Charge	4,800	2 * 200 * 12 months
Mailing Charges	1,800	150 * 12 months
Maintenance	3,600	300 * 12 months
Repairs	15,600	1 % of capital investment
Insurance	5,928	0.38 % of capital investment
Advertisement	100,000	
Others	13,800	
Total	444,255	

Appendix 8. Variable Cost at operating rate of 100 %

(in thousand Won)

Item	Amount	Remarks
Raw Material	4,615,500	1,500 M/T * 3,077 Won/kg
Electricity	51,000	500 kWh * 8 hrs * 300 days * 42.5 Won/kwh
Fuels	100,800	0.3 kl * 8 hrs * 300 days * 140 thou.Won/kl
Wages	40,893	male worker 5,877 female workers (8) 35,016
Packing	122,724	< 500 gram package > p.e.film : 70 Won*2000*487M/T box : 300 Won* 50 * 487 M/T sticker : 10 Won*2000*487 M/T sub-total : 85,225 < 5 kilogram package > p.e.film : 300 Won*200*487M/T box : 300 Won *50 * 487 M/T sticker : 10 Won *200*487 M/T sub-total : 37,499
Interest on Working Capital	338,278	working capital requirement : 2,818,987 thou.Won weighted average rate of interest : 12 % per annum _ NACF : 10 % _ PACs : 14 %
Total	5,269,195	

Appendix 9. Variable Cost for Project Period

(in million Won)

Item	Variable Cost by Year			
	1 year	2 year	3 year	4 year onwards
Raw Material	4,615	4,923	5,231	5,539
Electricity	51	54	58	61
Fuels	101	108	114	121
Wages	41	44	46	49
Packing	123	131	139	147
Interest on Working Capital	338	360	382	404
Total	5,269	5,620	5,970	6,321

Appendix 10. Working Capital Requirement
at operating rate of 100 %

(in thousand Won)

Item	Amount	Remarks
Raw Red Pepper Inventory	1,923,125	Duration : 5 months raw red pepper : 1,500 M/T * 3,077 Won/kg * 5/12
Finished Good Inventory	447,931	Duration : 1 month fixed cost : 444,255 * 1/12 variable cost : 4,930,917 * 1/12
Accounts Receivable	447,931	the same as finished good inventory
Total	2,818,987	

* Working Capital Requirement from 2nd year onwards

2 year : 3,001,983

3 year : 3,184,980

4 year : 3,367,976
onwards

Appendix 11. Cash Flow (continued)

(in million Won)

Year	0	1	2	3	4
Cash Inflow	0	6,338	6,760	7,183	7,605
1. Sale Revenue	0	6,338	6,760	7,183	7,605
2. Salvage Value	0	0	0	0	0
Cash Outflow	2,625	5,570	5,921	6,271	6,622
1. Capital Investment	2,625	0	0	0	0
2. Fixed Cost	301	301	301	301	301
3. Variable Cost	0	5,269	5,620	5,970	6,321
Net Cash Inflow	-2,625	768	839	912	983
Corporation Tax	0	67	75	83	90
NCI after tax	-2,625	701	764	829	893
(Discount Factor)	1.0000	0.8850	0.7831	0.6931	0.6133
Present Value of NCI after tax	-2,625	620	598	575	548

- Note 1) Fixed cost does not include depreciation and interest on term loan.
- 2) Corporation tax is imposed on gross profit at a rate of 10.75 percent. In this case, fixed cost include depreciation and interest on term loan.
- 3) Discount factor here is based on a discount rate of 13 %.

Appendix 12. Cash Flow

(in million Won)

Year	5	6	7	8
Cash Inflow	7,605	7,605	7,605	8,240
1. Sale Revenue	7,605	7,605	7,605	7,605
2. Salvage Value	0	0	0	635
Cash Outflow	6,622	6,622	6,622	6,622
1. Capital Investment	0	0	0	0
2. Fixed Cost	301	301	301	301
3. Variable Cost	6,321	6,321	6,321	6,321
Net Cash Inflow	983	983	983	1,618
Corporation Tax	90	90	90	90
NCI after tax	893	893	893	1,528
(Discount Factor)	0.5428	0.4803	0.4251	0.3762
Present Value of NCI after tax	485	429	380	575

- Note 1) Fixed cost does not include depreciation and interest on term loan.
- 2) Corporation tax is imposed on gross profit at a rate of 10.75 percent. In this case, fixed cost include depreciation and interest on term loan.
- 3) Discount factor here is based on a discount rate of 13 %.

Fifth ICA/Japan Training Course for
Strengthening Management of
Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: MEAT PROCESSING MILL
<i>COUNTRY</i>	: KOREA
<i>PROJECT PREPARED BY</i>	: KYU-HYUN, LEE

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

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ACKNOWLEDGEMENTS

The fifth ICA/Japan training course for strengthening management of agricultural cooperatives in Asia (October 22, 1990–May 10, 1991) was a very good opportunity to understand the concept of the integrated cooperatives and the management for me.

Also it has given me a good chance to understand various aspects of agricultural cooperatives of south–east Asia countries and have more interested in the ways of increasing the farmers' income as well as the agricultural situations and the management problems.

Under this programme, the project for meat processing mill was prepared to increase the income of the small farmers.

For giving me this valuable opportunity, I would like to express my gratitude to the staff members of I.C.A. regional office in New Delhi and the professors of I.I.M. in Amedabad, and specially to project director of I.C.A., Mr.M.V. Madane.

I am also grateful to the chairman and the staffs of NLCF who gave me a chance to participate in this course.

Feb. 1991

KYU HYUN, LEE

CHAPTER 1. Summary

1-1. Due to recent increase in average per capita income, the demand for meat and livestock products has increased substantially.

This increasing demand has been met both through more production and imports that cover domestic shortfalls. The expanding market demand for livestock products has made livestock production relatively more profitable than food crops cultivation.

1-2. The type of Korean livestock industry is being changed into specialized business from traditional farming.

1-3. To increase the income of livestock farmers, this project deals with the meat processing mill.

1-4. Hong Sung Gun will be selected as site.

This district belongs to Choong Nam province, located in west district of Korea, and well connected with expressway and train.

1-5. Main raw material is hogs.

1-6. Production Capacity

Classification	Carcass	Processing			Remark
		First	Second	Total	
Quantity(Head)	600	700	700	1,400	* Slaught ability 2000Head/day
Fresh meat product ratio(%)	65	38	38	—	* Hog : 90kg
Raw meat conversion quantity(M/T)	31.10	23.94	23.94	47.88	

1-7. Finish goods product

Unit : M/T(8 hours/day)

Item		Quantity required of raw meat	finish goods production	Ratio (%)	Remarks
First processing	Partial meat	10.05	10.05	20	
	Prepackage meat	13.89	13.89	28	
	Sub total	23.94	23.94	48	
Second processing	Ham	10	9	18	
	Sausage	5.94	8.91	18	
	Bacon	5	4.25	8	
	Can	3	4.20	8	
	Sub total	23.94	26.36	52	
Total		47.88	50.30	100	

1-8. The construction of meat processing mill needs 2years period and 21,500 million won of capital investment. Out of this, 17,000 million won would be financed by foreign loan, 2,000 million won would be financed by government livestock development fund, 2,500 million won is supplied by the self-capital.

1-9. This project life is assumed to be 9years, and 2years will be required in construction of this meat processing mill.

1-10. In financial analysis, NPV is calculated as 3,570 million won on the basis of 15% discount rate. IRR 17.71%, BEP(Fourth year) : 12,570M/T, B.C.R : 1.17 (at 15%)
Pay back period : 7years

Increase income to livestock farmers : 308,152 won/M/T

CHAPTER 2. BACK GROUND

2.1 Overall Situation

2.1-1 The present situation of domestic meat processing industry

Recently 11 enterprises are leading to domestic meat processing industry. Among them, 3 enterprises (Jeil Jedang, Lotte Ham, Jinjoo Ham) account for 80% of total domestic meat processing product.

2.1-2 Livestock Products and Meat Processing Products

- 1) The supply of livestock and meat processing product is increasing every year.
- 2) So livestock farmers want to raise more livestock to increase their income.

Table 1. Livestock Production Consumed Per Capita.

(Unit : kg)

Year	Meat			Total	Egg	Milk
	Beef	Pork	Chicken			
1970	1.2	2.6	1.4	5.2	4.29	1.4
1975	2.0	2.8	1.6	6.4	4.56	4.6
1980	2.6	6.3	2.4	11.3	6.54	11.0
1983	2.9	7.4	3.0	13.3	6.80	18.2
1987	3.6	8.9	3.3	15.8	8.59	32.1
1989	3.4	11.1	3.7	18.2	9.00	38.9

2.1-3 Demand prospect of meat processing products

- 1) Due to recent increase in average per capita income, the demand for meat processing products has increased substantially.
- 2) With this demand, livestock production has been increased considerably.

Table 2. Meat Production & Meat Processing Production

(Unit : M/T)

Classification	Pork			Beef			Chicken		
	Production	Processing Product	Ratio (%)	Production	Processing Product	Ratio (%)	Production	Processing Product	Ratio (%)
'78	171,612	3,956	2.3	74,287	—	—	82,189	—	—
'80	235,181	5,779	2.5	93,250	—	—	90,456	—	—
'85	345,298	12,695	3.7	116,859	982	0.8	126,246	30	0.0
'86	321,197	13,759	4.3	150,761	840	0.6	129,388	800	0.6
'87	376,654	18,669	5.0	149,217	512	0.3	140,690	1,743	1.3
'88	432,498	31,732	7.3	126,582	927	0.7	148,992	—	—

Source : MAFF

2.1-4 Fostering of livestock products and meat processing by the Government

- 1) In Korea, the stable supply of livestock products and meat processing products and the maintenance of the reasonable price of the meat processing products are very significant not only for the income enhancement of livestock farmers but for the national economy.
- 2) Specially the price of livestock products is unstable for the reason of the change in the quantity of production.
To abolish such problem, the government is endeavoring to bring up meat processing industry.
- 3) The Government has to permit to establish meat processing technical college of NLCF to develop of livestock industry.

2.2 Area of Project

2.2-1 Location

Area of project, Hong-Sung Gun Choong-Nam Province, is located in western area of Korea.

Cho^{ng}g Nam Province covers the area of 8,317km² and its population is 2 million as of the end of 1989.

The general conditions of Choong-Nam Province are as follows. (appendix 1.2.3.4.5)

Area of Jurisdiction

It has 5 cities and 15 gun and there are 15 local livestock cooperatives.

2.2-2 Population

The total household of this area 468 thousand with a population of 2,003 thousand.

The farm households are 223,393 around 48% and farmers are 887,613 about 44%.

Table 3 : Population(in 1989)

(Unit : thousand)

Classification	Farm	Non-farm	Total
Nation	6,786	35,594	42,380
Province	888	1,115	2,003
Rate(%)	13.1	3.1	4.7

2.2-3 Major Production

The major products of the area are rice, barley, apple, hogs etc.

Table 4.

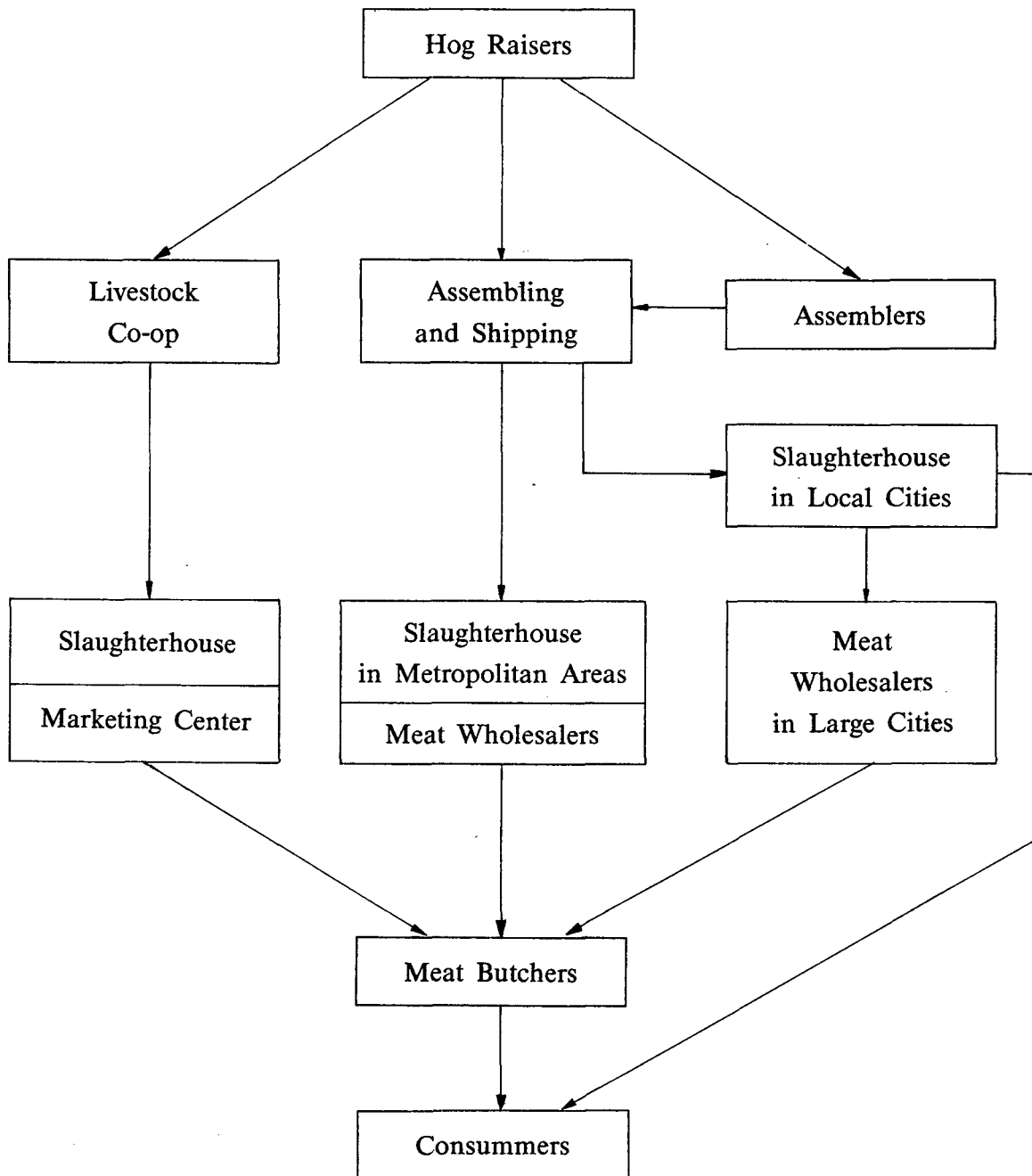
(Unit : thousand M/T)

Classification	Rice	Barley	Apple	Hogs
'87	838	12	78	29,923
'88	971	11	80	30,846
'89	905	7	81	26,981

2.2-4 Marketing System

- 1) Most of the major products of this area are marketed through cooperative marketing channel, and the cooperatives are striving to increase the prices received by farmers through marketing information development.
- 2) Products are marketed mostly to Seoul, Daejun, Kwang-Joo, Pusan and military service.
- 3) Livestock promotion guide officers at the meat processing mill help farmers to better understand the relation between meat processing mill and the raising of livestock.
- 4) To provide free medical treatment and technical education on management and feeding for the livestock farmer, veterinary team of NLCF travel around remote areas where veterinarians are not available.

Table 5. Marketing channel of hog



2.3 Problems faced by farmers

2.3-1 Present marketing

- 1) Traditional farms raise hogs as a side-line business to supplement their cropping enterprises, and thus they often market only one or two hogs or several piglets per year.
- 2) Most of the farmers sell their hogs through cooperative marketing channel.
- 3) Sometimes small quantity of the hogs are marketed through brokers due to the shortage of co-op's man power.

2.3-2 Reason for low marketing share

- 1) Hogs are sometimes sold to hog assembling dealers at the farm gate. Using this marketing service, it is not necessary for the sellers to pay transaction fees at livestock market.
- 2) Recently some commercial enterprises have been raising a large number of hogs. These type of firms reap benefits from mass transactions entered into directly with central assemblers or wholesalers. In such transactions, some marketing processes and agents are eliminated.

2.4 Needs and Justification for the project

2.4-1 Increase the farmers' income

- 1) NLCF will establish the meat processing mill in Hong Sung which capacity is 50M/T of meat processing per day.
- 2) It is expected that the income increase of agriculture and the expansion of employment in this area would be effected.

2.4-2 Accommodation of livestock farmers' desires

The construction of meat processing mill which use hogs as raw material would accommodate farmers' desire & would protect farmers from possible losses caused by trickery of middle merchants' transaction.

2.4-3 Prospecting of meat processing Industry

1) Due to increase the per capita income, the demand of meat processing products increase.

So meat processing industry will be growing due to the change of living environment and food patterns.

2) To stabilize price of hogs, Government have to support meat processing industry. And NLCF plans to expand for more services for livestock farmers.

Table 6. Prospecting of demand of meat processing products

Unit : M/T

YEAR \ Item	HAM	SAUSAGE	BACON	CAN	Total
1991	67,789	72,317	15,819	70,085	225,983
1995	193,636	206,545	45,182	200,090	645,453
2000	389,470	415,435	90,876	402,453	1,298,234

Source : KRE1

CHAPTER 3. PROJECT

3.1 Objectives

The main object of this project lies in the enhancement of member farmers' income and service expansion.

The detailed objectives are as follows.

- 3.1-1 To increase the income of livestock farmers.
- 1-2 To protect the hog farmers by processing hogs produced by those who are members of livestock co-ops.
- 1-3 To maintain the stability of hog price.
- 1-4 To enhance the co-op's activities to support farmers.
- 1-5 To contribute to the national economy by developing of meat processing industry.
- 1-6 To return of profits to members earned through operation.

3.2 Area of operation

This project will be operated in the area of Hong Sung and raw material will be provided in this area and from adjacent areas.

Also in this area, the mill is well arranged with convenient uses of all energy facilities such as electricity and water.

3.3 Project components

3.3-1 Mill construction

- 1) The mill, with the daily capacity 50M/T of packing meat & meat processing products, will require two years in construction for the cost of about 21,500 million won.
- 2) Construction site will be determined in the project area taking into consideration transportation and the collection of raw materials.

3.3-2 Procurement

- 1) The raw materials of meat processing products will be procured in this area linked with Integrated Hog Production Program of NLCF.
- 2) Integrated Hog Production Program is conducted to stabilize the domestic hog production through planned production and marketing and also to improve the quality of pork by producing triple hybrid hogs.
As of the end of 1990, 34 cooperatives are listed and their activities contribute a lot to friendly relations between members as well as raising farmers' income.
- 3) And some hogs will be provided by the livestock farmer according to the supplying contract.

3.3-3 Processing

- 1) Processing products are divided by six products such as partial meat, prepackage meat, ham, sausage, bacon, can.
- 2) Each meat processing products such as ham, bacon, sausage, etc has a different progress of work.
And high skilled techniques are needed for processing.

3.3-4 Marketing

- 1) The products will be sold through the agents, NLCF chain store, supermarkets, department store, cooperative's chainstore, etc.
- 2) The partial meat will be exported by the NLCF to foreign country.
- 3) NLCF will advertise the meat processing products they produced through TV, radio, newspapers for the promotion of marketing.

3.3-5 Extention

- 1) Livestock promotion guide officers at the meat processing mill provide raising techniques to the farmers.
- 2) NLCF will make efforts not only to increase of marketing activities for the farmers' income but to induce more participation of farmers through return of profit and other services.

CHAPTER 4. DETAILS OF OPERATION

4.1 Capacity of the mill

The mill will produce 50M/T of processed meat products (first product 24M/T, second product 26M/T) per a day (8 working hours).

4.2 Main products

- First processing : Partial meat, Prepackage meat
- Second processing : Ham, Sausage, Bacon, Can

4.3-1 Machineries and Equipments.

The machineries and equipments are showed as follows.

Item	Unit	Scale	Remarks
Land	Pyung	20,000	1m ² = 0.325pyung
Slaughter house	◇	2,080	
Meat processing mill	◇	2,030	
Dormitory	◇	230	
Chilled Vehicle/ Transport			chilled vehicle : 20 bus : 3 car : 6

4.3-2 Capital cost of the project

The capital cost of this project is estimated as below.

Unit : million won

Item	Cost	Life	Remarks
Land	4,300		20,000pyung×215,000won
Building and other civil construction work <div style="margin-left: 20px;"> [slaughterhouse meat processing mill dormitory </div> contingencies(10%)	5,009 501	40	
Machineries & Electricity <div style="margin-left: 20px;"> [meat processing machinery sausage processing machinery bacon processing machinery can processing machinery </div> contingencies(10%)	9,945 995	9	
Chilled Vehicle	400	5	20×20,000,000
Bus	90	5	3×30,000,000
Car	60	5	6×10,000,000
Miscellaneous fixed asset	80	5	furniture & office equipments
Pre-operative and other expenses	120		
Total	21,500		

4.3-3 Working capital requirement (at 50% capacity)

In the first year the working capital is needed as below.

Unit : million won

Item	Cost	Remarks
Raw materials(hog)	252	700 HEAD×3 days×120,000won
Other materials(spices)	46	24M/T×10 days×191won/kg
Packing materials	138	24M/T×25 days×230won/kg
Wage	87	150labor×580,000won×1 month
Salary	97	95 officers×1 month
Fuel & Power	15	
Repair & maintenance	10	
Advertisement	8	
Administrative expenses	15	
Receivables	977	24M/T×4070won/kg×10 days
Total	1,645	

4.4 Sources of funds for capital Investment

- 1) Borrowing from government : 2,000million won at an interest rate of 3% per annum for a term of 15 years inclusive of a grace period of 5 years.
- 2) 17,000 million won would be available as a long term loan from foreign country at an interest rate of 5% per annum for a term of 25 years inclusive of a grace period of 10 years.
- 3) 2,500 million won is NLCF own capital.

Source of funds

(Unit : million won)

foreign loan	government loan (Livestock Development Fund)	NLCF's own capital	Total
17,000	2,000	2,500	21,500

4.5 Production

(Unit : M/T)

Classification	1 Year	2	3	4	5	...	9
Carcass	5,265	7,371	9,477	10,530	12,110	...	12,110
Partial meat	1,507	2,110	2,713	3,015	3,467	...	3,467
Pre-packaged meat	2,083	2,916	3,750	4,167	4,792	...	4,792
Ham	1,350	1,890	2,430	2,700	3,105	...	3,105
Sausage	1,336	1,871	2,405	2,673	3,074	...	3,074
Bacon	637	892	1,147	1,275	1,466	...	1,466
Can	630	882	1,134	1,260	1,499	...	1,499
Sub total	7,543	10,561	13,579	15,090	17,353	...	17,353
By-Products	4,620	6,468	8,316	9,240	10,626	...	10,626
Total	17,428	24,400	31,372	34,860	40,089	...	40,089
Capacity	15,000	15,000	15,000	15,000	15,000	...	15,000
Utility Ratio	50%	70%	90%	100%	115%	...	115%

4.6 Procurement of Raw materials

- 1) The raw materials of meat processing products will be procured linked with Integrated Hog Production Program of NLCF.
- 2) The members of co-operatives supply hogs to the mill according to contract.

4.7 Processing procedure (appendix 11)

4.8 Marketing

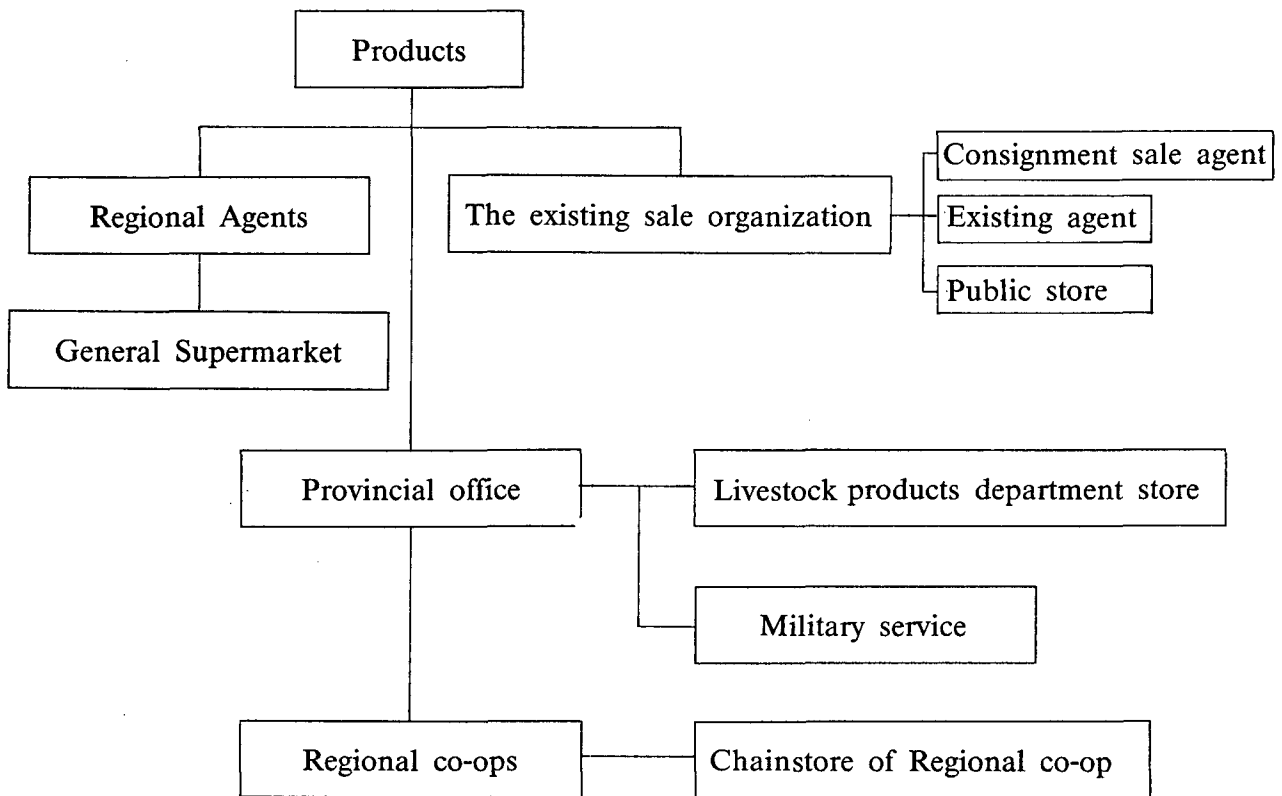
4.8-1 Price of Products

(Unit : won/kg)

Item	Selling Price	Weight of products
Partial meat	3,400	20%
Pre-packaged meat	3,000	28%
Ham	5,500	18%
Sausage	4,000	18%
Bacon	5,500	8%
Can	5,000	8%

- 4.8-2 Packing will be made in the form of vacuum packing & can packing of 0.2kg, 0.5kg, 1kg, 3kg etc, using P.P. film & aluminium with the NLCF's brand.

4.8-3 Marketing channel



4.8-4 Advertisement

To accelerate the sale of products, NLCF will advertise through mass communication media such as TV, magazine & newspaper, radio.

And free taste corners will be opened in the sales shops.

4.9 Progress of work

Item \ Period	1 2 3 4 5 6						7 8 9 10 11 12						1 2 3 4 5 6						7 8 9 10 11 12							
	1. Purchase of Land	←→																								
2. Land development & Survey			←→																							
3. Basic layout				←→																						
4. Details of draft					←→																					
5. Ordering & purchasing of machinery						←→																				
6. Construction & facilities							←→																			
- building								←→																		
- machineries									←→																	
- electricity										←→																
- water purify											←→															
7. Test working																								←→		

CHAPTER 5. ORGANIZATION AND MANAGEMENT

5.1 Management

The meat processing mill will be operated by the NLCF.

So NLCF will regulate all management of the meat processing mill.

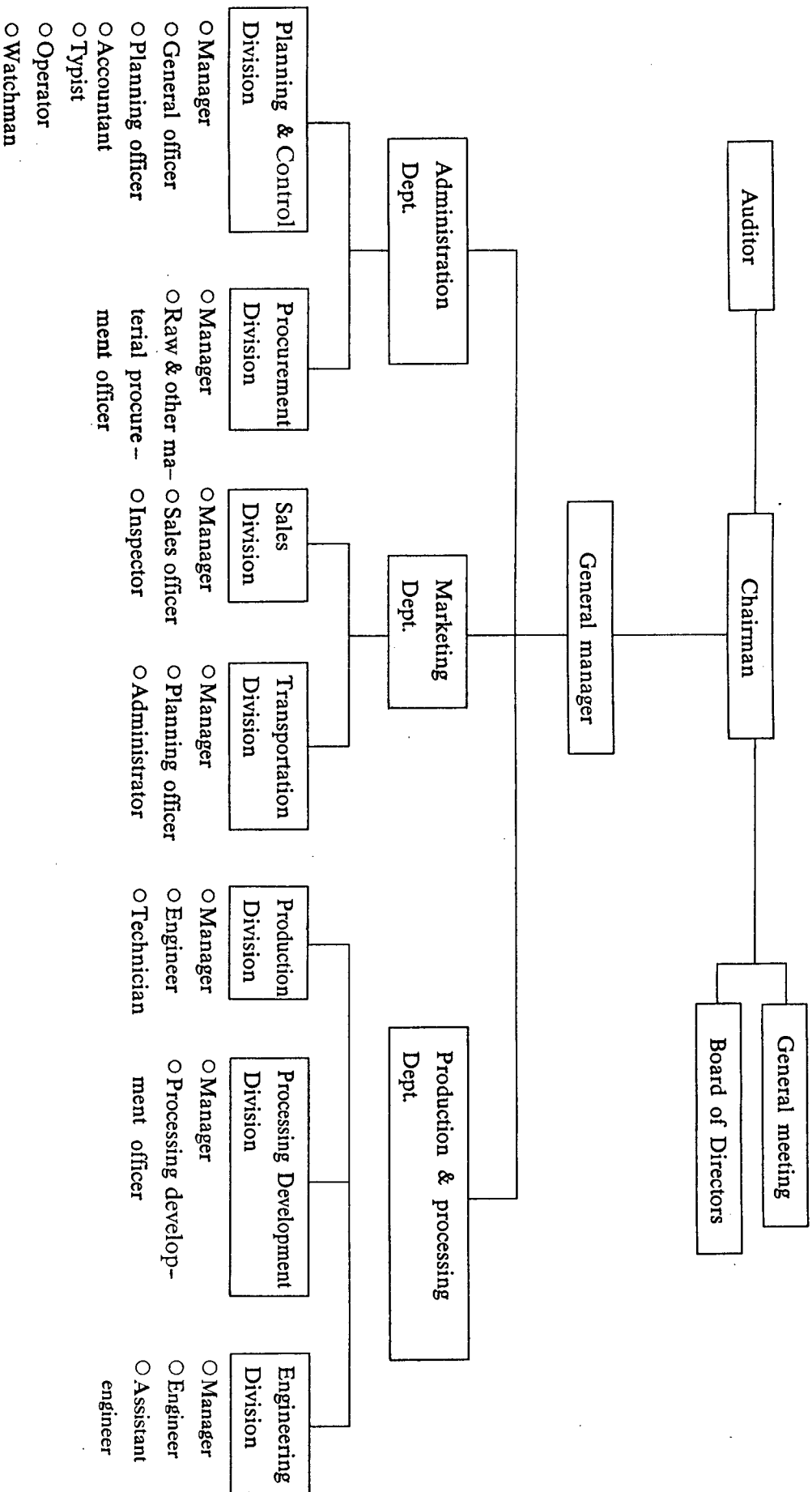
5.2 Contents of management

A separate organization will be set up for this project operation and the manager will be appointed by the chairman of the NLCF.

Summarized management activities are as follows.

- Administration and general management
- Planning & accounting
- Procurement of Raw materials
- Production
- Marketing
- Processing Development
- Engineering

5.3 Organization chart



5.4 Task of Division

5.4-1 Administration Department

Administration department is in charge of accounting, financing, administration and other affair concerned.

This department has timely to purchase raw materials for producing the products.

5.4-2 Marketing Department

Marketing dept. is in charge of marketing promotion such as advertisement, collecting market information in order to increase the market share of the products.

And this dept. controls transportation vehicle to supply the products.

5.4-3 Production & Processing Department

Production & Processing dept. is in charge of production schedule, utilization of capacity maintenance and development of new products.

In order to produce a high quality products, this dept. control as follow.

- Machinery maintenance and repair
- Workers control
- Supervision
- Quality control

CHAPTER 6. FINANCIAL ANALYSIS

6.1 Financial analysis has been set forth under basic assumption as follows.

6.1-1 Project life is 11 years including the construction period of 2 years, and the life of building, machinery, cars is 40 years, 9 years, 5 years respectively.

6.1-2 Depreciation cost would be calculated as follows.

(Unit : million won)

Classification	Cost	Life	Depreciation cost	Salvage value	Remark
Building	5,510	40 years	124	4,394	Investment cost × (1 - 10%) ÷ Life year
Machinery & Electricity	10,940	9 years	1,094	1,094	
Equipment Cars	200 550	5 years 5 years	36 99		
Total	17,200		1,353		

6.1-3 Selling price & selling ratio are supposed to be as follows.

Item	Price(won/kg)	selling ratio(%)
partial meat	3,400	20
prepackaged meat	3,000	28
Ham	5,500	18
Sausage	4,000	18
Bacon	5,500	8
Can	5,000	8

6.1-4 Slaughter commission : 3,000 won/HEAD
Income of by-product : 2,320 won/HEAD

6.2 Production cost

6.2-1 Fixed cost

(Unit : million won)

classification	1 year	2	3	4	5	6	7	8	9
salary	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169
repair & maintenance	50	50	50	50	50	50	50	50	50
advertising	100	100	100	100	100	100	100	100	100
administrative expenses	180	180	180	180	180	180	180	180	180
Total	1,499	1,499	1,499	1,499	1,499	1,499	1,499	1,499	1,499
interest of investment	910	910	910	910	910	910	910	910	910
depreciation	1,353	1,353	1,353	1,353	1,353	1,218	1,218	1,218	1,218

6.2-2 Variable cost

(Unit : million won)

classification	1 year	2	3	4	5	6	7	8	9
raw material	25,200	35,280	45,360	50,400	57,960	57,960	57,960	57,960	57,960
other material	1,375	1,925	2,476	2,751	3,163	3,258	3,356	3,457	3,561
packing material	1,662	2,327	2,992	3,324	3,823	3,938	4,056	4,178	4,303
transportation	75	106	136	151	174	179	184	189	195
wages	1,050	1,103	1,158	1,216	1,277	1,315	1,354	1,395	1,437
interest on working capital(10%)	165	231	297	330	380	391	403	415	427
fuel & power	180	198	218	240	264	272	280	288	297
Total	29,707	41,170	52,637	58,412	67,041	67,313	67,593	67,882	68,180

6.2-3 Interests of the Investment

(Unit : million won)

classification	1 year	2	3	4	5	6	7	8	9
Total Investment	21,500	21,500	21,500	21,500	21,500	21,500	21,500	21,500	21,500
NLCF Own Capital	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Government loan	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Foreign loan	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000
Government loan interest	60	60	60	60	60	60	60	60	60
Foreign loan interest	850	850	850	850	850	850	850	850	850
Total Interest	910	910	910	910	910	910	910	910	910

※ Interest rate

Government loan : 3% P.A. for a term of 15 years inclusive of a grace period of 5 years

Foreign loan : 5% P.A. for a term of 25 years inclusive of a grace period of 10 years

6.3-1 FINANCIAL ANALYSIS

Unit : (M/T : million won)

Classification	0 Year	1	2	3	4	5	6	7	8	9
Investment	21,500									
Capacity		15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090
Production		7,543	10,561	13,579	15,090	15,090	17,353	17,353	17,353	17,353
Revenue(A)		30,700	42,983	55,266	61,416	70,627	74,158	77,866	81,759	85,847
Revenue(B)		757	1,060	1,363	1,514	1,742	1,829	1,920	1,998	2,098
Total revenue		31,457	44,043	56,629	62,930	72,369	75,987	79,786	83,757	87,945
V. cost		29,707	41,170	52,637	58,412	67,041	67,313	67,593	67,882	68,180
Contribution		1,750	2,873	3,992	4,518	5,328	8,674	12,193	15,875	19,765
F. cost		1,499	1,499	1,499	1,499	1,499	1,499	1,499	1,499	1,499
Cash inflow		31,457	44,043	56,629	62,930	72,369	75,987	79,786	83,757	93,433
Cash outflow		31,206	42,669	54,136	59,911	68,540	68,812	69,092	69,381	69,679
Net cash flow	-21,500	251	1,374	2,493	3,019	3,829	7,175	10,694	14,376	23,754
Cumulative cash flow	-21,500	-21,249	-19,875	-17,382	-14,363	-10,534	-3,359	7,335	21,711	45,465

* F.Cost : Exclude depreciation and longterm loan interest

6.3-2 Pay Back Period : 7 years

6.3-3 Break Even Capacity

$$\frac{\text{Total fixed cost(+ Depreciation + interest of long term loan)}}{\text{Total revenue - Total variable cost}}$$
$$= \frac{1,499 + 1,353 + 910}{62,930 - 58,412} = \frac{3,762}{4,518} = 83.3\%$$

$$* \text{ BEQ : } 15,090\text{M/T} \times 83.3\% = 12,570\text{M/T}$$

6.3-4 Net Present Value

1) NPV : dicount rate 15% : 3,601 million won

2) NPV : dicount rate 17% : 868 million won

3) NPV : dicount rate 18% : -358 million won

6.3-5 Internal rate of return

NPV(17%) = +868 million won

NPV(18%) = -358 million won

$$\text{IRR} = 17\% + \left| \frac{18 - 17}{-358 - (868)} \right| \times 868 = 17.71\%$$

6.3-6 Benefit cost ratio

$$\text{BCR} = \frac{25,070}{21,500} = 1.17(\text{at } 15\%)$$

6.3-4 Net Present Value

	NET CASH FLOW	i = 15%		i = 17%		i = 18%	
		D.C RATE	NPV	D.C RATE	NPV	D.C RATE	NPV
0	-21,500						
1	251	.8696	218	.8547	214	.8475	213
2	1,374	.7561	1,039	.7305	1,004	.7182	987
3	2,493	.6575	1,639	.6244	1,557	.6086	1,517
4	3,019	.5718	1,726	.5337	1,611	.5158	1,557
5	3,829	.4972	1,904	.4561	1,746	.4371	1,674
6	7,175	.4323	3,102	.3898	2,797	.3704	2,658
7	10,694	.3759	4,020	.3332	3,563	.3139	3,357
8	14,376	.3269	4,700	.2848	4,094	.2660	3,824
9	23,754	.2843	6,753	.2434	5,782	.2255	5,357
TOTAL			25,101		22,368		21,142
NPV			3,601		868		-358

6.3-7 Increasing Income to Livestock Farmers(for 9 years)

1) Total Profit to the Society=Total contribution–Total fixed expenses

$$74,968 - 33,818 = 41,150 \text{ million won}$$

2) Total raw materials for 9 years=133,538M/T

3) Extra income per ton=41,150 million won ÷ 133,538M/T=308,152 won

6.3-8 Sensitive Analysis

If the selling price and slaught commission increase 3%, IRR is 23.0% and BCR is 1.49 at 15% of D.C rate.

6.3-9 Financial Viability

17.71% of IRR is high rate compare with general bank deposit rate(11.5%).

So this project will viable financially.

CHAPTER 7. BUDGET

Unit : million won

Item	Operating year				
	1	2	3	4	5
1. Sales revenue	31,457	44,043	56,629	62,930	72,369
2. Production cost	31,206	42,669	54,136	59,911	68,540
3. EBIT	251	1,374	2,493	3,019	3,829
4. Interest	910	910	910	910	910
5. E B T	- 659	464	1,583	2,109	2,919
6. Tax(5×10%)		46	158	211	292
7. E A T	- 659	418	1,425	1,898	2,627
8. Depreciation	1,353	1,353	1,353	1,353	1,353
9. NET PROFIT	-2,012	-935	72	545	1,274

CHAPTER 8. RECOMMENDATION

- 8-1.** This Project will increase the income of livestock farmers and generate added value of 41,150 million won for 9 year.
- 8-2.** This Project can accelerate industrialize of rural area.
- 8-3.** The NLCF should provide financial support and technical guidance to the member farmers.
- 8-4.** The NLCF has to make positive investment in meat processing mill to increase income of livestock farmers.
- 8-5.** The Government has to permit to establish meat processing technical college of NLCF to develop of livestock industry.
- 8-6.** The Government should have keen interests in the development of meat processing industry for the livestock farmers and rural area economy.
- 8-7.** The Government should support the finance to the NLCF & the farmers with low interest rate.
- 8-8.** The Government has to exempt from taxation in co-operative business.

APPENDICES

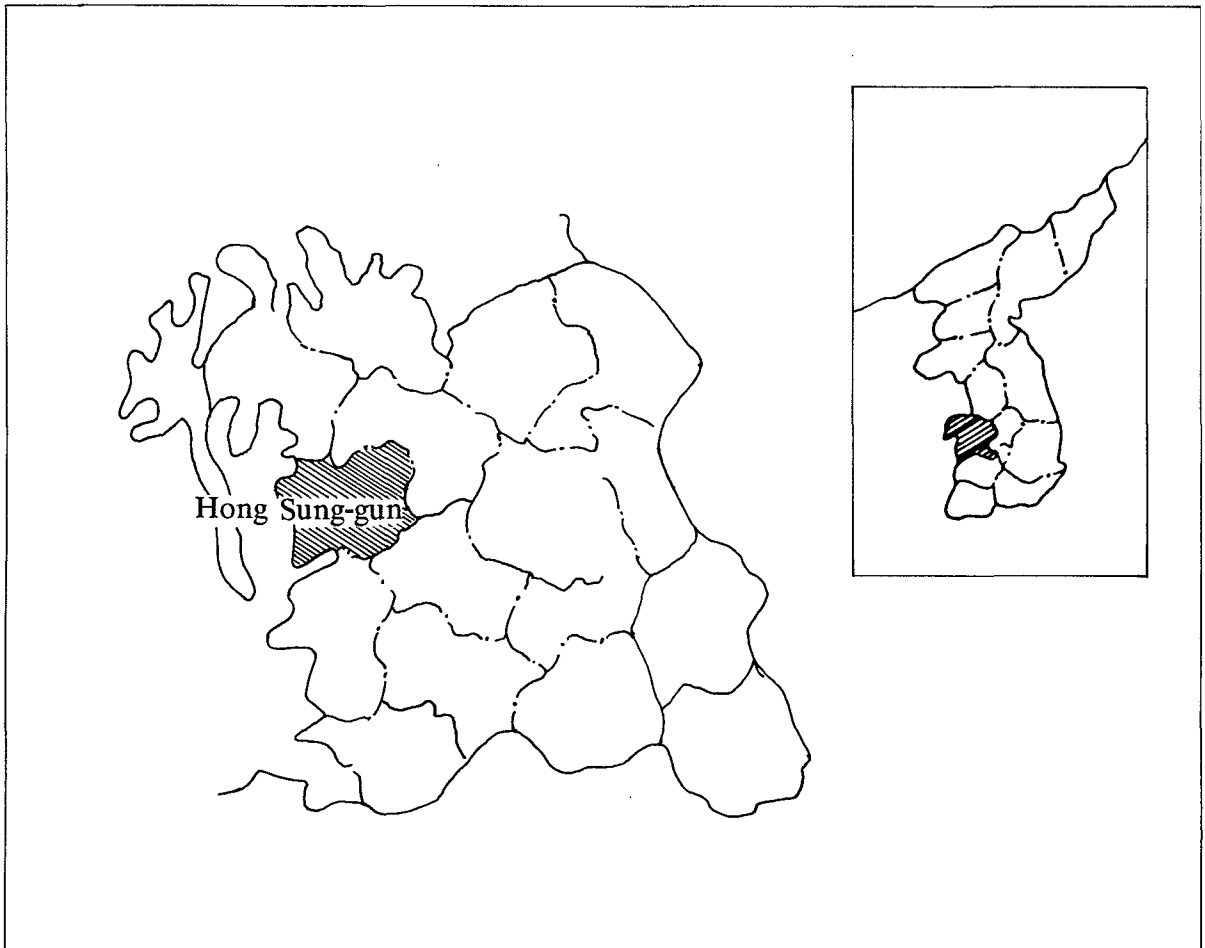
1. Project area
2. Climate of project area
3. Status of land area by type
4. Food crop production
5. Farming population and households
6. Income of farm household
7. Number of livestock and households
8. Number of raising household by breeding size(pig)
9. Number of head by breeding size(pig)
10. Farm price of hog
11. Processing procedure
12. Salaries

1. Project area

- Area

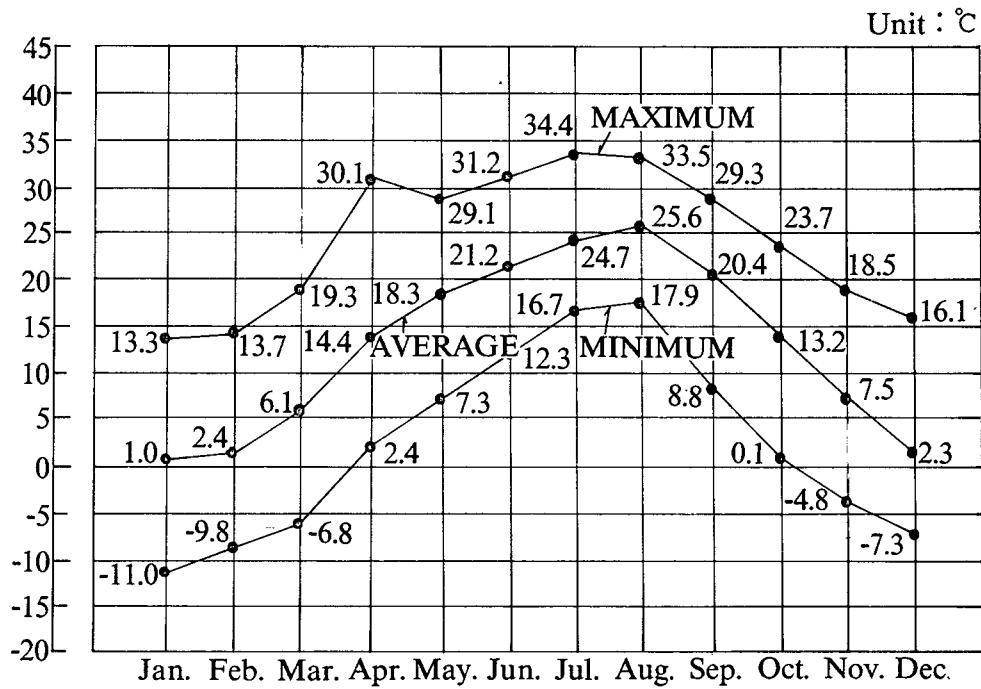
Nation	Choong Nam	Rate
99,236.58km ²	8,316.7km ²	8.38%

- Location

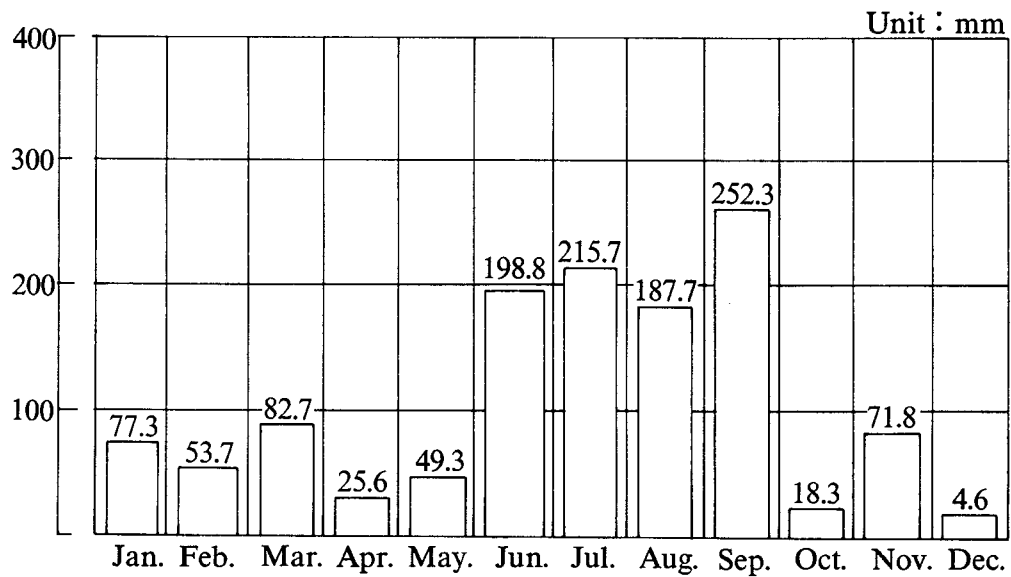


2. Climate of project area

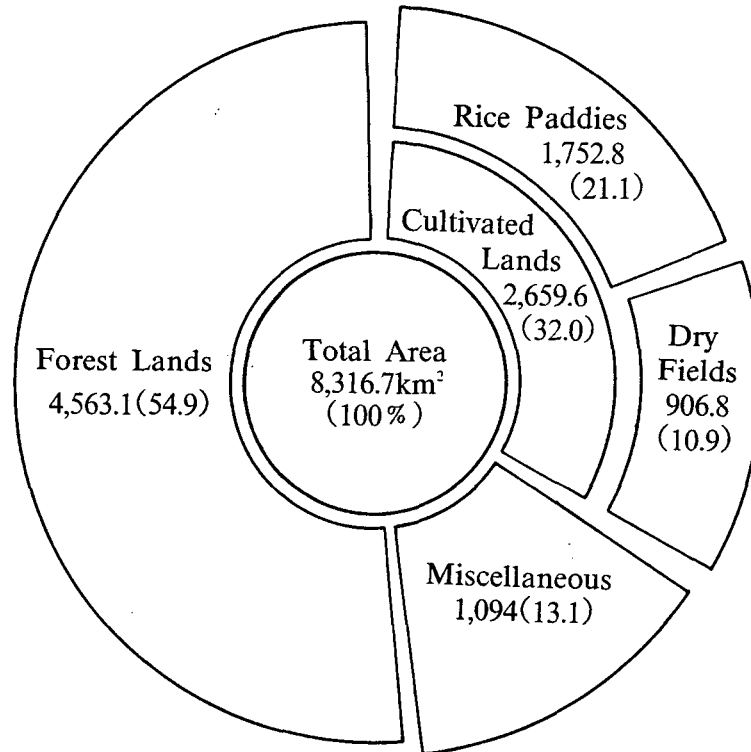
Temperature by Month



Precipitation by Month

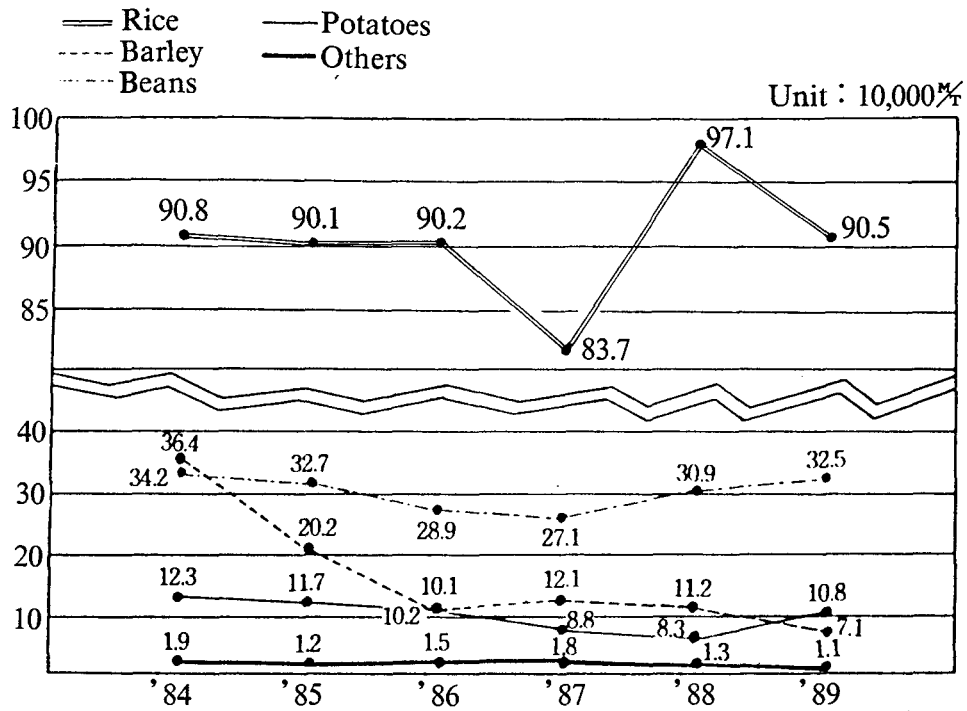


3. Status of land area by type

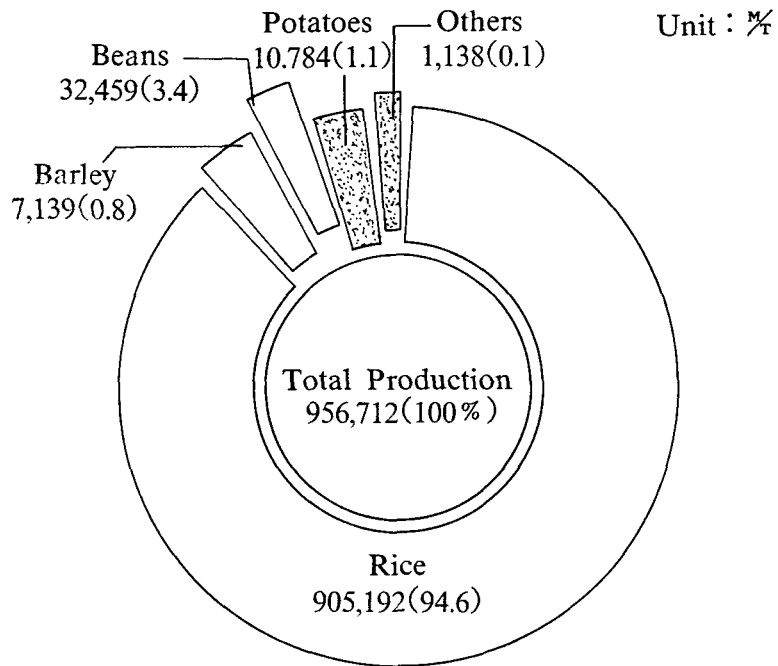


Stream 281.9(25.8)
Drain 178.6(16.3)
Building Sites 172.9(15.8)
Roads 154.8(14.1)
Pool & Reservoir 87.4(8.0)
Others 218.4(20.0)

4. Food crop production

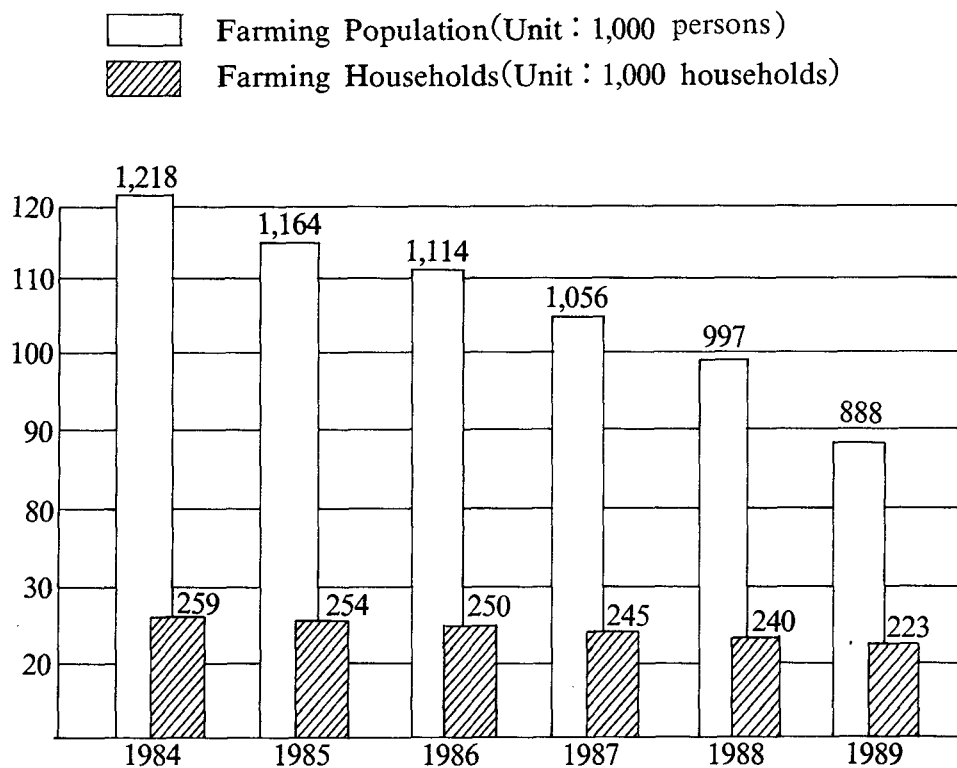


● '89 Food Crop Production



5. Farming population and households

● Farming Population and Households



6. Income of farm Household

(Unit : 1,000 Won)

Year	Income on farm household	Agricultural income			Non-agricultural income	
		Amount	Gross income	Management expenses	Amount	Composition of non-agri income(%)
1971	356	292	357	65	64	18.1
1972	429	353	428	75	76	17.7
1973	481	390	480	90	91	18.8
1974	674	542	664	122	132	19.6
1975	873	715	891	176	158	18.1
1976	1,156	921	1,166	245	236	20.3
1977	1,433	1,036	1,334	298	397	17.7
1978	1,884	1,356	1,769	413	529	28.0
1979	2,227	1,531	2,027	496	696	31.2
1980	2,693	1,755	2,342	587	938	34.8
1981	3,688	2,476	3,269	793	1,211	32.8
1982	4,465	3,031	3,998	967	1,434	32.1
1983	5,128	3,331	4,702	1,371	1,797	35.0
1984	5,549	3,699	5,276	1,577	1,850	33.3
1985	5,736	3,699	5,477	1,778	2,037	35.5
1986	5,995	3,677	5,619	1,942	2,318	38.7
1987	6,535	4,016	5,984	1,968	2,519	38.5
1988	8,130	4,912	7,226	2,314	3,218	39.6

Source : MAFF, Agriculture, Forest and Fishery Statistics

7. Number of Livestock and Households

(Unit : 1,000 Head, Households)

Year	Beef cattle		Dairy cattle		Pig		Chicken	
	No.of cattle	Household raising	No.of cattle	Household raising	No.of pig	Household raising	No.of chicken	Household raising
1971	1,250	1,049	30	3	1,333	925	25,903	1,110
1972	1,338	1,107	36	4	1,248	861	24,537	1,045
1973	1,493	1,191	52	5	1,595	817	23,701	1,004
1974	1,785	1,359	73	7	1,818	890	18,814	1,002
1975	1,556	1,277	86	9	1,247	654	20,939	1,094
1976	1,463	1,196	90	10	1,953	910	26,325	1,237
1977	1,508	1,173	109	14	1,482	689	30,224	1,179
1978	1,651	1,176	136	16	1,719	658	40,753	1,172
1979	1,599	1,092	163	17	2,843	758	41,120	923
1980	1,361	948	180	18	1,784	503	40,130	692
1981	1,312	858	194	28	1,832	425	42,999	628
1982	1,526	896	228	23	2,183	444	46,592	618
1983	1,940	971	275	30	3,649	539	49,239	538
1984	2,318	1,037	334	38	2,958	362	46,483	367
1985	2,553	1,048	390	44	2,853	251	51,081	303
1986	2,370	991	437	43	3,347	262	56,095	282
1987	1,923	854	463	38	4,281	303	59,324	269
1988	1,559	701	480	36	4,852	261	58,467	194
1989	1,536	654	515	36	4,801	198	61,689	145

Source : MAFF, Agriculture, Forest and Fishery Statistics

8. Number of Raising Household by

Class Year & Month	Head	1~4 Head	5~9	10~19	20~29	30~49
Sep. 1982	479,925	411,360	29,590	26,960	2,547	3,439
Dec.	443,852	386,919	24,500	20,340	2,733	3,677
Mar. 1983	427,972	345,690	34,230	34,750	2,903	3,745
June.	529,487	420,820	47,460	44,770	3,720	4,615
Sep.	560,312	436,850	51,360	51,840	4,128	5,689
Dec.	539,403	426,230	47,380	44,450	4,439	5,783
Mar. 1984	472,871	364,950	47,810	40,470	4,519	5,736
June.	447,610	355,870	36,900	35,500	4,019	5,421
Sep.	398,239	316,690	29,050	33,510	3,383	4,925
Dec.	362,474	297,130	22,990	24,370	3,212	4,602
Mar. 1985	316,765	253,110	22,340	24,900	2,845	4,173
June.	298,502	239,910	19,960	22,260	2,914	4,111
Sep.	291,192	232,590	18,630	23,100	2,660	4,092
Dec.	251,196	205,105	13,747	13,924	4,322	4,436
Mar. 1986	225,501	171,150	16,792	18,123	5,454	4,728
June.	238,360	184,425	16,257	18,484	5,061	4,829
Sep.	245,005	182,179	16,742	22,453	6,609	5,843
Dec.	262,403	202,497	18,579	19,186	6,090	5,454
Mar. 1987	261,513	194,013	20,647	22,477	6,601	6,217
June.	286,148	206,746	23,455	26,973	8,386	7,643
Sep.	299,721	206,622	26,753	32,277	10,228	8,791
Dec.	302,891	219,329	26,220	25,856	8,909	8,435
Mar. 1988	281,458	196,381	25,766	27,906	9,162	8,201
June.	268,666	179,855	23,902	30,391	9,891	8,958
Sep.	262,044	170,800	22,896	30,866	10,722	9,249
Dec.	260,760	179,035	21,715	25,397	9,164	8,454
Mar. 1989	241,171	158,030	21,050	27,794	9,164	8,533
June.	232,041	142,666	22,365	28,336	10,413	9,535
Sep.	219,923	131,300	22,012	27,935	9,849	9,750
Dec.	197,933	128,970	19,093	18,510	7,077	7,546
Mar. 1990	165,378	108,844	14,515	15,962	5,786	5,825
June.	138,760	90,015	10,582	14,695	4,308	5,051
Sep.	131,482	80,171	11,083	15,015	4,833	5,339
Seoul	39	18	0	1	0	0
Pusan	377	203	21	68	13	16
Taegu	389	62	71	103	29	20
Inchon	295	54	51	44	9	21
Kwangju	271	143	20	16	28	3
Taejeon	329	159	13	31	19	19
Kyônggi	20,345	8,490	1,892	3,010	1,099	1,369
Kangwon	2,812	891	362	337	186	290
Choongbuk	3,616	1,732	377	422	141	194
Choongnam	30,624	18,745	2,830	4,300	1,149	1,050
Chõnbuk	14,354	9,311	1,396	1,496	447	562
Chõnnam	28,808	24,227	1,610	1,376	352	332
Kyõngbuk	9,853	3,431	1,117	1,947	651	757
Kyongnam	17,559	11,430	1,270	1,808	699	637
Cheju	1,811	1,275	53	56	11	69

Source : M.A.F.F

Breeding Size(pig)

(Unit : Households)

50~99	100~499	500~999	1000~4999	5000~9999	10000 and Over
3,544	2,241	164	64	10	6
3,309	2,152	146	70	11	4
3,926	2,475	154	81	10	8
4,895	2,919	179	87	15	7
6,120	3,973	225	103	17	7
6,614	4,126	258	99	18	6
5,594	3,482	204	86	14	6
5,751	3,802	232	95	13	7
5,920	4,341	280	104	19	7
5,514	4,256	255	119	19	7
5,154	4,039	253	123	21	7
4,902	4,021	254	139	23	8
5,142	4,479	309	157	25	8
4,918	4,206	343	159	27	9
4,748	4,006	311	156	25	7
4,747	4,046	309	167	25	10
6,051	4,540	369	180	28	11
5,474	4,528	366	190	28	11
6,364	4,608	360	187	28	11
6,960	5,337	400	208	28	12
8,516	5,846	432	216	28	12
7,918	5,528	448	208	27	13
7,706	5,558	528	208	29	13
8,729	6,084	581	236	28	13
9,785	6,764	659	259	34	10
8,846	6,802	730	265	32	9
8,619	6,914	735	282	38	12
9,895	7,627	839	316	36	13
9,792	8,075	833	329	36	12
8,033	7,580	776	309	29	11
6,485	6,819	800	306	26	10
6,160	6,714	883	314	29	9
6,631	7,011	1,003	358	29	9
12	7	1	0	0	0
12	40	2	2	0	0
38	60	6	0	0	0
40	68	4	3	1	0
25	31	5	0	0	0
31	52	5	0	0	0
1,619	2,338	378	137	10	3
397	299	24	25	1	0
377	325	38	9	0	1
1,315	1,029	147	51	7	1
636	434	53	16	1	2
473	353	59	20	4	2
866	935	102	45	2	0
707	827	134	44	3	0
83	213	45	6	0	0

9. Number of Head by

Year & Month	Head	1~4 Head	5~9	10~19	20~29	30~49
Sep. 1982	2,384,595	559,000	205,480	341,480	61,288	131,013
Dec.	2,183,159	524,560	164,850	260,970	65,412	139,588
Mar. 1983	2,570,556	480,620	238,000	445,930	70,104	143,456
June.	3,182,706	620,520	328,800	576,260	89,782	176,911
Sep.	3,720,584	648,770	356,450	674,400	99,459	217,909
Dec.	3,648,965	621,930	325,520	581,740	106,822	222,124
Mar. 1984	3,259,001	521,740	333,060	526,070	108,609	217,679
June.	3,181,182	503,950	255,680	459,830	96,665	207,938
Sep.	3,176,544	430,550	203,570	431,130	81,653	190,124
Dec.	2,958,089	397,830	158,780	314,030	77,042	176,874
Mar. 1985	2,841,078	334,530	158,080	319,300	68,566	160,380
June.	2,825,212	318,070	140,730	287,020	69,903	158,413
Sep.	3,041,482	308,500	131,240	295,680	63,904	158,206
Dec.	2,852,799	270,003	93,062	177,839	100,994	164,824
Mar. 1986	2,873,229	230,668	118,018	231,828	129,550	178,275
June.	2,932,299	253,594	112,712	234,433	120,272	182,725
Sep.	3,397,327	250,630	117,252	288,859	115,438	220,241
Dec.	3,347,350	288,612	126,816	247,046	142,816	205,799
Mar. 1987	3,516,241	278,570	143,441	289,798	155,696	235,502
June.	4,020,867	299,594	163,479	347,972	199,537	290,337
Sep.	4,532,265	307,246	188,052	417,509	243,056	334,450
Dec.	4,250,345	328,501	180,018	336,290	210,696	318,841
Mar. 1988	4,273,775	291,505	180,460	364,043	216,561	315,864
June.	4,607,100	265,854	167,712	391,858	235,853	339,944
Sep.	4,993,540	251,051	161,272	403,469	254,301	353,239
Dec.	4,852,041	264,883	150,298	335,186	222,730	322,121
Mar. 1989	4,931,709	233,000	146,261	363,376	217,094	326,257
June.	5,371,978	212,023	158,751	367,361	246,880	362,881
Sep.	5,466,847	194,465	155,974	361,504	234,547	369,286
Dec.	4,801,104	190,781	131,219	240,597	168,614	287,807
Mar. 1990	4,303,352	157,234	101,200	209,867	138,037	222,976
June.	4,251,336	126,374	74,710	290,166	101,705	192,223
Sep.	4,566,125	113,386	79,820	194,375	114,311	203,500
Seoul	2,519	36	0	10	0	0
Pusan	17,994	360	182	888	263	652
Taegu	22,385	138	453	428	706	819
Inchon	35,947	120	358	804	187	887
Kwangju	13,187	221	124	254	716	118
Taejeon	18,715	346	79	420	420	601
Kyônggi	1,448,317	14,342	13,631	40,011	26,196	52,567
Kangwon	189,098	1,593	2,532	4,542	4,324	11,524
Choongbuk	181,753	2,548	2,548	5,142	3,207	7,156
Choongnam	767,088	26,787	20,849	56,043	27,605	40,279
Chõnbuk	344,750	13,124	9,733	18,973	10,546	20,340
Chõnnam	350,664	30,670	11,882	16,905	8,278	12,724
Kyõngbuk	537,693	5,829	7,934	26,045	15,240	29,450
Kyongnam	524,803	15,764	9,149	22,167	16,389	23,675
Cheju	111,212	1,508	430	743	234	2,708

Source : M.A.F.F

Breeding Size

(Unit : Heads ())

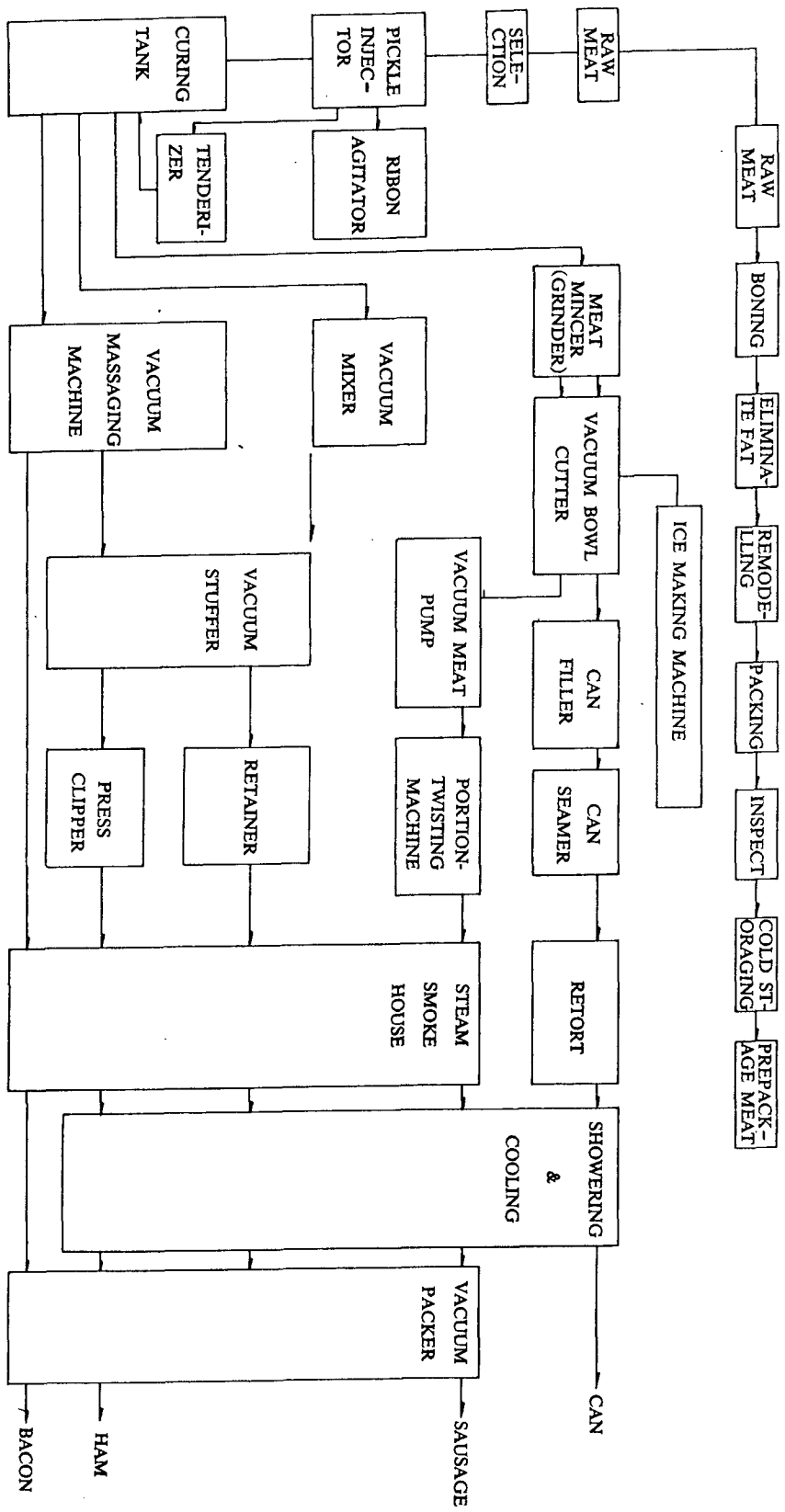
50~99	100~499	500~999	1000~4999	5000~9999	10000 and Over
242,511	408,937	111,661	153,417	63,432	106,576
227,013	395,502	102,272	156,742	70,118	76,126
271,007	449,017	104,931	186,053	60,263	121,175
338,206	527,472	123,181	188,954	91,586	121,034
423,175	705,970	153,024	210,495	107,279	123,653
455,653	726,705	175,080	205,768	119,107	108,516
384,208	623,132	138,606	195,214	96,410	108,273
399,956	680,047	158,064	213,119	88,659	117,276
415,937	776,576	188,267	213,202	121,532	124,003
384,801	779,051	172,160	238,309	128,059	131,153
358,875	747,494	170,474	246,732	149,290	127,357
341,487	756,207	172,953	270,996	157,231	152,202
361,358	847,268	208,986	312,166	172,641	154,533
337,122	812,217	235,408	319,117	180,647	161,506
325,695	791,630	217,117	321,934	171,889	155,604
322,926	807,169	216,917	333,135	165,721	182,495
423,868	931,554	261,033	357,480	184,441	206,531
376,347	934,772	257,553	375,090	185,909	206,590
436,973	958,196	251,790	377,871	186,008	202,396
490,293	1,136,955	280,156	414,031	186,465	212,048
603,060	1,277,879	303,385	436,596	193,847	227,285
555,049	1,201,921	309,326	424,666	176,070	237,937
357,406	1,184,240	355,803	414,215	188,887	224,791
609,670	1,324,827	388,692	470,241	190,701	221,748
690,197	1,490,934	441,489	503,364	239,071	204,153
622,407	1,501,664	481,029	526,090	231,439	194,194
606,016	1,547,869	485,001	534,312	254,178	218,345
692,677	1,714,565	550,303	590,353	244,493	231,691
693,723	1,827,817	553,166	618,340	244,487	208,538
561,171	1,712,030	523,163	603,725	200,487	181,510
446,507	1,535,907	543,285	607,709	184,568	156,062
434,660	1,562,192	600,728	614,575	201,212	152,791
476,660	1,669,268	671,631	685,968	200,174	156,932
786	1,077	610	0	0	0
589	9,030	1,159	4,871	0	0
2,785	12,285	3,771	0	0	0
2,535	14,444	3,017	6,456	7,139	0
1,663	6,191	3,900	0	0	0
2,517	11,095	3,237	0	0	0
119,869	571,316	252,373	245,314	65,818	46,880
28,065	67,272	16,160	47,277	5,809	0
26,958	79,160	24,770	18,230	0	11,998
92,871	240,264	98,697	91,704	56,535	15,454
44,380	101,148	35,236	34,619	5,274	51,377
34,836	87,972	41,127	44,237	30,810	31,223
61,859	213,537	69,807	96,469	11,530	0
51,259	198,548	87,506	83,087	17,259	0
5,695	55,929	30,261	13,704	0	0

10. Farm price of hog

Unit : won/HEAD

classification	Young Pig	Pig(90kg)
1984	21,250	102,410
1985	34,330	130,598
1986	44,000	140,900
1987	34,000	110,000
1988	30,000	108,450
1989	24,000	93,780
1990	41,000	148,000

11. Processing Procedure



12. Salaries

Unit : thousand won

Position	No.of Staff	Amount	Remarks
General manager	1	28,795	28,795×1
Deputy general manager	3	70,605	23,535×3
Manager	7	147,672	21,096×7
Assistant manager	16	264,416	16,526×16
Engineer, Officer	32	348,800	10,900×32
Assistant engineer, Junior officer	6	65,400	10,900×6
Other officer	30	243,570	8,119×30
Total	95	1,169,000	—

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: Intergrated Sheep Rearing And Marketing Project As An Economic Venture.
<i>COUNTRY</i>	: Malaysia
<i>PROJECT PREPARED BY</i>	: Ku Mohamad Rodzi Felcra

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

Headquarters:
Route des Morillons 15
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INTEGRATED SHEEP REARING AND MARKETING PROJECT
AS AN ECONOMIC VENTURE UNDERTAKEN BY
FELCRA SEBERANG PERAK SETTLERS'
COOPERATIVE SOCIETY LIMITED

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Acknowledgements

The fifth ICA Japan Training Course For Strengthening Management Of Agricultural Cooperative in Asia (October 22, 1990 - May 10, 1991) provides a very good opportunity for me to understand better the concept of integrated cooperatives and their management.

It has allowed me an opportunity to understand various aspects of Agricultural Cooperatives prepared under this course-programme.

I would like to express my gratitude to staff of Felcra elcra Settlers' Cooperative Society Limited of Seberang Perak, Perak; staff of I.C.A., R.A.O. in New Delhi, the professors of Indian Institute of Management (IIMA), in Ahmadabad, and specially to Project Director of ICA/Japan Management Training Project, Mr. M.V. Madane; to ANKASA and FELCRA which allow me to participate in this course. My thanks also go to Professor A.H. Kairo for providing me valuable information and comments for this project.

January 1991

Ku Mohamad Rodzi
Felcra
Kuala Lumpur.

Chapter 1: Summary

- 1.1 Name of Project : The proposed project is to established an integrated sheep rearing and marketing project as an economic venture
- 1.2 Name and address of the Cooperative : Felcra Seberang Perak Settlers' Cooperative Society Limited
- 1.3 Office address for correspondence : Felcra Seberang Perak
36800 Kampong Gajah
Perak
- 1.4 Name of the Promotor : Felcra Seberang Perak Settlers' Cooperative Society Limited
- 1.5 Constitution : Multipurpose Primary Cooperative Society

1.6 Annually rearing and marketing capacity

	Year 1	Year 2	Year 3	Year 4	---> Year 10
Sheep rearing	2000	1800	2000	2000	2000
Annual Lambing (after mortality)	1836	1846	2052	2052	2052
Marketing (annually)	-	1546	1746	1952	1952

1.7 Manpower requirement is one manager and 8 casual labour.

1.8 Project Cost

(a) Setting up of pens	\$ 67,200.00
(b) Purchasing of female (hwees)	\$460,000.00
(c) Purchasing of male	\$ 24,000.00
(d) Misc. (Pens equipment and initial expenditure)	<u>£ 1,400.00</u>
	<u>\$552,500.00</u>

1.9 Working capital needed : \$ 83,049.00

1.10 Sources of fund

Total Expenditure : \$ 635,649.00

(Capital Investment
+ working capital)

Loan 80% : \$508,919.20

Owner Equity 20% : \$127,129.80

1.11 Profitability : Repayment on loan after one year grace
period, to be paid in 7 years.

1.12 Pay back period 6 years

1.13 Break Even Quantity 6,192 heads

1.14 IRR 14%

1.15 BCR 2.61

Chapter 2 Background

2.1 Overall Situation

2.1.1 Fulcrum Seberang Perak Integrated Development Project aims to:

2.1.1.1 increase the income of farmers in the rural area especially those involved in agriculture;

2.1.1.2 upgrade and maximise utilisation of land and provide stable income through diversification of activities;

2.1.1.3 create employment opportunities and restructure society according to the objectives of the New Economic Policy;

2.1.1.4 provide social, technical and economic infrastructure for the local community; and

2.1.1.5 develop agriculture in the surrounding areas through rehabilitation and consolidation of land.

2.1.2 The ultimate aim of the Felora Seberang Perak Integrated Development Project is to consolidate the various land schemes in the area under one project management. It is the nation's objective that the project would assist in increasing, rice as well as tree crops production such as oil palm and cocoa. It provides 6,000 employment opportunities increase settlers' income and simultaneously modernise the rural sector.

2.2 Area of Project

2.2.1 Felora Seberang Perak Integrated Development Project covers an area of 13,147 hectares located towards the right bank of Perak River between Southern Straits of Malacca in the West and Ipoh-Baruas Road in the North. The area which developed consist of :

- 2.2.1.1 Development of 6,547 hectares of oilpalm.
- 2.2.1.2 Developments of 1,296 hectares of cocoa.
- 2.2.1.3 Developments of 4,462 hectares of paddy.

2.2.2 Of the above area about 822 hectares have been allocated for the establishment of settlement area at Sungai Dadap and a town centre which is known as Bandar Baru Seberang Perak. The area is for establishment of settlement for 4,000 settlers family. A map showing the above area is as in Annexure 16.

2.3 Problems Faced by Farmers

2.3.1 At the early stage of development, there was problem of erratic funding for the project which dampen the pace of development of the project. There was slow development of technical, social and economic infrastructure as a result of the above negative development. However this problem was gradually solved with the establishment of Project Coordination Office in 1981. There was also gradual flow of fund from the Federal Government and also the World Bank.

2.3.2 Other than the above problem, the project is also under constant threat from wild boars, elephants and other pests and diseases. Occasional attacks from these pests and diseases caused much damage to the crops especially padi, cocoa and oil palm.

These problems have been able to be alleviated with measures taken by Wild Life Department, Forest Rangers and also the Department of Agriculture (DOA). However attacks from these pests and diseases have not been able to be fully eliminated.

2.3.3 Other than the above, the settlers' economy is also a dependant upon fluctuations of world commodity prices which inversely affect the economy of the settlers. A drop in commodity prices of the crops would mean a drop in settlers' income. It is with the aim of alleviating the problem caused by fluctuation in world commodity prices that the following income generating project is proposed.

2.4 Need and Justification for the Project

2.4.1 The settlers' population in Felera Seberang Perak is totally dependant on commodities such as padi, cocoa and oil palm. The development of these commodities are influenced by fluctuations in world commodity prices.

2.4.2 At the same time, the crops are susceptible to attack by pest and diseases. Any serious attacks by pests and diseases upon the crops will determine the yield of the crops and also the income of the settlers. Poor crop yield would mean less income to the settlers for any particular season. Introduction of income generating and valued added activities would assist as a buffer to reduce the negative effect of bad crop yield or low price on the settlers' economy. Sheep rearing project has been identified as one of these income generating activities.

2.4.3 Efforts are needed to increase livestock productivity such as sheep rearing as integrated approach, without affecting the crop production. Currently the sheep has great potential to be integrated with such plantation crops.

2.4.4 In the maintenance of the tree crop plantation, one of the major field operations is the control of weeds. The use of herbicides to control weeds are expensive and most herbicides currently available pose some danger to workers and the environment. The use of sheep as a 'biological weed control' agent has been shown to be effective, economical and safe.

2.4.5 At the same time this project can joint and share the market high price meat demand. The total demand of mutton (sheep and goat meat) is estimated at 6,740 metrik tones a year. About 93% of the total requirements are imported as froozen sheep meat.

Chapter 3 The Project

3.1 The Project Benefit

3.1.1 The project involves an integrated approach : rearing of sheeps as an economic venture to supplement livestock requirement of the community . This activity will be managed by Felcra Seberang Perak Settlers' Cooperative Society Limited.

3.1.2 Implementation of the above projects has given both direct and indirect benefits to settlers and the estates concerned. The benefits are as follows:

3.1.2.1 Provision of Extra Income to the settlers.

The income depends on the total number of sheep reared. Cooperative whom undertake the sheep rearing project will be able to reap the income.

3.1.2.2 Reduction in the Cost of Weeding

This is a direct benefit to the estate concerned. For those estates that undertake the above project, a reduction between 15-30% in the cost of weeding can be attained.

3.1.2.3 Creation of Employment Opportunities

This project is able to create employment opportunities for members of the co-operative. Member of the cooperative or youths can work as casual labourers. Farmers who are involved in these projects other than getting dividends and wages will also benefit from the technical knowledge from involvement in the projects.

3.1.2.4 Provision of cheap source of organic fertilizer to the estates

As they graze, the sheeps will provide organic fertilizer to the crops, especially oil palm. Other than this the droppings can be processed into fertilizer pellets which benefit the project as supplementary source of income.

3.2 Objectives

The main objectives in the above project would be:

3.2.1 To breed prime sheep stock

3.2.2 To increase for the breeding and fattening

3.2.3 To market selected lamb breed for local and overseas market wherever possible.

3.3 Area of Operation

3.3.1 Kelora Seberang Perak project has a planted area of 6547 hectares of oil palm.

This area will be able to accommodate around 19,641 heads of sheep in the ratio of three (3) heads per hectare of pasture land. Eventhough the area is more than enough in term of grazing land available, only ± 2,000 heads of sheep will be reared at any one time.

3.3.2 The Thai Long Tail variety has been chosen because of its bigger frame and adaptability to the area. The price as a revenue as an Annexure 4.

FIGURE 1. PROPOSED NUMBER OF SHEEPS IN
HELORA SEBERANG PERAK

<u>YEAR 1991</u>	<u>NO. OF SHEEPS (HEADS)</u>	<u>DI (50%)</u>
June	500	20
August	500	20
October	500	20
December	<u>500</u>	<u>20</u>
Total	<u>2,000</u>	<u>80</u>

3.4 Project Components

3.4.1 Procurement

Procurement of the stock either for breeding or fattening will be done by Heliga (Malaysia) Sdn. Bhd. with the assistance of Helora Seberang Perak Cooperative Society Limited. The Cooperative will buy for breed at the price \$ 230/head ex-Seberang Perak Project.

3.4.2 Breeding and Fattening

The main stock for breeding programme will be from the Thai Long Tail breed or a combination of Thai Long Tail and local Malim breed. The Thai Long Tail breed has been selected because of their bigger frame and adaptability to the local pastoral and climatic conditions.

The sheeps will graze on the available pasture in the project under close and constant supervision by the project manager and the sheperds. Prime male lambs reserved for 'fattening' will be carefully selected from the available stock. These lives stock will getting their nutrients feed from the available pasture area. The female will be keep for bread and the reminder to be sold off.

3.4.3 Marketing

Feicra Seberang Perak Settlers' Cooperative Society Limited will market the products locally either as mutton or 'live heads' at Local Farmers' Market or through arrangement with interested entrepreneurs. In the first stage, Maitge Malaysia Sendirian Bernad will buy all available stock in the project.

Whatever stock which is not able to be disposed off the project level will be undertaken by Halige (Malaysia) Sdn. Berhad at an agreed price with Felora Seberang Perak Settlers' Cooperative Society Limited.

3.4.4 Extension and training

Extension and technical services as backward linkages will be provided by Felora, and the Department of Veterinary Service. The objective is to instill technical knowledge about sheep breeding to those who undertake the project. This is to ensure they have sufficient technical knowledge to undertake successful management of the project. Sheep breeding is comparatively new venture for this Cooperative and so there should be sufficient technical inputs to the 'stockmen' and 'sheperds'.

3.4.5 By-products Processing

Cooperative with assistance from Rubber Research Institute of Malaysia (RRIM) in future will set up a Fertilizer Pellet mill to process by-products from the sheeps. This is another project proposed by Seberang Perak Settlers' Cooperative Society to be set up in the future.

Chapter 4 Details of Operation

4.1 Stock Breeding

4.1.1 Proposed Melaka Seberang Perak Settlers' Cooperative with regard to marketing and fattening of sheep shall involve:-

- a. Contract in the form of "buy-back" of all rams produced as a result of the above breeding project;
- b. Fattening scheme of lambs for purpose of meeting the demands of both local and export market; and
- c. Giving technical extension and forward linkages to Co-operation staff with regards to stock under the feed lot project.

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4.1.2 The emphasis of the above project is

- a. to prepare and arrange market linkage for the disposal of products arising from the projects either those stock arising from small scale activities of settlers of those population outside the project (non-settlers); and
- b. establishment of livestock to export market.

4.1.3 Breeding of livestock shall include:-

- a. Rearing of sheep on available pasture;
- b. Establishment of "storing" and "rehabilitating" centres for stock which are imported so that they are acceptable to the local conditions;

- c. establishment of a "stock centre" of selected sheep shall be stock for future development or breeding of sheeps; and

The ultimate aim is to establish a commercial and viable feedlot project utilising a combination of 'agricultural by-product' technology.

- 4.1.4 Cooperative will employ an experienced stockmen as manager. Cooperative will monitor the development of the project and shall report to the management of the cooperative and the Project Development Committee.

4.2 Stock Fattening

- 4.2.1 Stock for fattening shall fulfill the following characteristics and conditions:
 - a. the total number of stock for fattening shall be in the capacity of 1000 rams (lambs) per year.
 - b. Selected lambs for breeding shall be of 25-30 kilograms in weight or about 8 months in age. For male lambs, the minimum age requirement or condition is 8 months.
 - c. The lambs shall be of cross-breed type (short-tail) or (long-tail) or lambs with docked tails.

- d. The price will be as agreed upon by Halige (K) Sdn. Berhad and Seberang Perak Cooperative Society. The price should be Ex-Halige Farm or ex-Export Holding Station.
- e. The stock shall be sent direct by Cooperative to Halige (Malaysia) Sdn. Berhad Farm as stated.

4.2.2 Selection of stock for fattening shall fulfill three (3) categories:

- a. Lambs for feed lot scheme shall be categorized and separated according to age. This is to ensure uniformity in the livestock to be fattened.
- b. Male lambs for 'conditioning' programme and for local market shall be separated according to weight and age. This is again to ensure uniformity.
- c. Male lambs for 'conditioning' and 'feedlotting' and also for export market shall be separated according to weight and 'live weight'. This is again to ensure uniformity.

4.2.3 The ultimate aim of lamb fattening project or separation to another pens is to produce within 6 months sheeps which attain weight of 35 kilograms. Lambs for this project will have a selected starting weight of 10-12 kilograms. This programme will also receive livestock which fulfill the above age and weight requirement for slaughter at the Abattoir.

Chapter 5: Organization and Management

5.1 The project will be managed and owned by FELCRA Settlers' Cooperative Society Limited of Seberang Perak and out of 80 % funding of the project is through Economic Project Revolving Fund and another 20 % will be beared by owner equity. A total of eight (8) motivated settlers will be selected and trained as supervisors and workforce for the project.

5.2 FELCRA Seberang Perak Settlers' Cooperative Society Limited has its own Rules and Regulations as stipulated in its by-laws. The cooperative is managed by ten (10) members who act as Board of Directors. The members shall include:

5.2.1 Six (6) board members elected during the Annual General Meeting of the Cooperative;

5.2.2 Two (2) representatives from FELCRA; and

5.2.3 Two (2) board members appointed by the Board of Directors.

5.3 Since its establishment, the management of the cooperative has appointed twenty seven (27) employees among the Settlers' community comprising mostly of settlers' children to see to the daily management of the cooperative and its activities. Selected employees have been given adequate training.

5.4 'Backward' and 'Forward' integration activities undertaken since then are as follows:

5.4.1 All types of activities in padi areas.

5.4.2 All types of activities in oil palm and cocoa areas.

5.4.3 Transportation of Fresh Fruit Bunches (FFB) from the field site to the mills.

5.4.4 Management of Mini-market.

5.4.5 Management of Insurance Activities.

5.5 A new activity undertaken by the cooperative is rearing of sheeps. A cooperative staff shall be appointed to be a manager of this project. Eight (8) sheperds shall also be recruited to manage the daily activities of the project. The organisation structure of the project is as in Annexure 14.

5.6 The task of the manager of the project is to supervise the project and be responsible for the breeding, fattening, marketing and other activities related to the management of the project.

5.7 The main task of the sheperds is to assure that the flock is released in the morning and berded back into the pens in the evenings. The sheperds must ensure that the sheeps are free from diseases and pests, and also safe from predators (wild animals).

5.8 At administrative level, as a means of backward linkages integration, Felcra has formed a committee among Felcra officers to see to the proper management of the project. The Project Implementation Committee comprises the following:

- a. Deputy Director Settlers' Economic Development Division - Chairman
- b. Agricultural Officer, Felcra Seberang Perak - Member
- c. Settler Development Officer, Felcra Seberang Perak - Member
- d. Asst. Settler Development Officer, Felcra Seberang Perak - Member
- e. Representative, KRIN - Member
- f. Representative, MARDI - Member
- g. Agricultural Officer, Technical Services (HQ) - Member
- h. Agricultural Officer, Planning Services (HQ) - Member
- i. Head, Livestock Development Unit (HQ) - Secretary

5.9 The above committee will convene monthly to discuss the performance of the project and initiate whatever action deemed necessary for its continued success.

5.10 The functions of the committee is to coordinate and solve whatever problems arising and provide the necessary inputs for the well-being of the project. Matters regarding the selection of stock for breeding, marketing and training programmes necessary for the project participants will be regularly discussed by the project managers and supervisors in order to familiarise themselves with the project.

5.11 The Project Implementation Committee will liaise closely with the Board of Pelera Seberang Perak Settlers' Cooperative Society. This is to ensure there is continual rapport between the management of the cooperative and the above project.

Chapter 6: Financial Analysis

6.1 Assumption in financial analysis:

Financial analysis has been set forth under main assumption as follows:

6.1.1 Project Life : 10 years

6.1.2 Investment are completed on first year

6.1.3 Pre operative expenditure is consisted, cost and the variable cost is changing accounting to the quantity of product.

6.1.4 Depreciation cost will be as follows:

Classification	Cost	Life	Depreciation
_____	<u>(₹)</u>	_____	<u>Cost (₹)</u>
a) Pens	67,200	10 years	6,720
b) Equipments	1,400	10 years	140

			6,860

6.2 Grazing Area : Palm oil estate (Pasture land)

6.3 Pens - The detail of various civil Construction Work like pens have been shown in the layout and plan and detail in annexure 15.

6.4 Measures of investment worth

- a) The present value at 10 % the NPV = \$ 75,871 (Annexure 9)
- b) BCR = 2.61
- c) IRR = 14 % (Annexure 11)
- d) Pay back period = 6 years (Annexure 8)
- e) Break even quantity = 6,152 heads (Annexure 13)

6. Assumption on 10 % decrease in total revenue, the measure of investment worth would be

NPV = 36,901

BCR = 1.81

IRR = 11.84 %

Pay back period = more than 6 years

Chapter 7: Budget

7.1 The budget for the first 10 years as an annexture \$.

a) Capital Investment	\$ 552,600.00
b) Working Capital	\$ 83,049.00

	\$ 635,649.00

Out of budget proposing 20 % on owner equity and 80 % from the loan.

7.2 Other items to be tabled out are as below

Years	Revenue	Recurring Cost	Surplus	Loan Repayment	Other Reserve
1	5,149	88,468	(83,049)	-	13,763
2	225,792	93,864	131,928	75,206	1,205
3	214,818	95,548	129,270	75,206	19,990
4	233,703	95,548	129,270	75,206	19,990

Years	Revenue	Recurring Cost	Surplus	Loan Repayment	Other Reserve
5	233,703	95,548	129,270	75,206	19,990
6	233,703	95,548	129,270	75,206	19,990
7	233,703	95,548	129,270	75,206	19,990
8	233,703	95,548	129,270	75,206	19,990
9	233,703	95,548	129,270	-	131,295
10	233,703	95,548	129,270	-	131,295

Chapter 8: Recommendations

8.1 Since the implementation of the project, a few problems have arisen but with the continual scrutiny from the project managers and labours, the problems are able to be alleviated.

8.2 The problems can be divided into Technical and Social:

8.2.1 Technical

Although funding has not been a major issue, the flow of fund to manage the project is erratic because Cooperative assumes that this project is priority compared to the overall activity of the organisation.

Since the project has been approved by Felcra's management and the Board of Directors of the cooperative concerned, I suggest that the allocation for the project be decentralized and managed by Project Implementation Committee, the body that is going to be in rapport with Felcra's management and also the management of the co-operative with regard to the project. This move will ensure better flow of fund to manage the project.

8.2.2 Social

Sheep rearing and breeding is a relatively new industry for this Cooperative. Being new, it is not surprising that some are sceptical about the success of the project whether at Felcra's management or at co-operative level. More information should be extended to both officers and settlers alike so that they can be really aware of the benefits derived from the project.

The above problem can be reduced by sending Felcra's officers and settlers to be attached to successful sheep rearing projects locally or overseas. At the same time the extension arm of Settlers Development Division in Felcra should be beefed up and their activities intensified. They should be aware of the profitability of the above venture.

8.3 The sheep rearing industry will be the mainstay of Felcra's Agricultural Diversification policy especially those of settlers' development. Backward and forward intergration activities related to the industry will be developed and intensified. If all levels of Felcra's management and the cooperative work together, I feel the project will be a success.

Fixed Capital Investment

Activities	M \$
1. Setting up of Pens (140' x 40' x 4.00 x 3 pens)	67,200.00
2. Purchasing Female (Ewes) (2000 x \$ 230.00)	460,000.00
3. Purchasing Males (DH 50%) (80 Head x \$300.00)	24,000.00
4. Misc (Pens Equipments and Initial Expenditure	1,400.00
	552,600.00

Fixed Cost

Activities	K \$
1. Maintainance	500.00
2. Labour (Wages) (\$ 300.00 x 8 labour x 12 months)	28,800.00
3. Officer Salary (Manager) (\$ 500.00 x 12 months)	6,000.00
4. Miscellaneous	1,200.00
	36,500.00

Variable Cost

First Year (3,712 heads)	
Activities	Rs
1. Additional Food (₹ 10 / head / year)	37,120.00
2. Medicine/Treatment (₹ 3 / head / year)	11,136.00
3. Pens Equipment / Misc (₹ 0.50 / head / year)	1,856.00
	50,112.00
=====	
Second Year (3,926 heads)	
Activities	Rs
1. Additional Food (₹ 10/head/year)	39,260.00
2. Medicine/Treatment (₹ 3 / head / year)	11,778.00
3. Pens Equipment / Misc (₹ 0.50 / head / year)	1,963.00
	53,001.00
=====	
Third Year (4,132 heads)	
Activities	Rs
1. Additional Food (₹ 10/head/year)	41,320.00
2. Medicine/Treatment (₹ 3 / head / year)	12,396.00
3. Pens Equipaent / Misc (₹ 0.50 / head / year)	2,066.00
	55,782.00
=====	

XX assumption until for 10 years the variable cost continue same

TECHNICAL PARAMETER

SUBJECTS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
1. Mortality (Lwes)	10 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %
2. Mortality (ON 50%)	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %
3. Mortality (Offspring)	15 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %
4. Lambing Rate	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

REVENUE

- 1. Female (Rejection): 20 kg / head @ \$3 / kg
- 2. Male (ON 50%) 35 kg / head @ \$4 / kg
- 3. Rams 30 kg / head @ \$4 / kg 8 months
- 4. Female 25 kg / head @ \$7 / kg 8 months

Salvage Value at The End
of 10 Years

a) Salvage Value of Sheep

SUBJECT	REVENUE	NOS OF HEAD	TOTAL (Rs)
Females (Ewes)	20 kg/head @ 60/kg	2,000	120,000
Males (DR 50 %)	35 kg/head @ 32/kg	60	11,200
Rams	30 kg/head @ 44/kg	1,025	133,120
Female	25 kg/head @ 71/kg	1,025	179,550
			443,870

b) Salvage Value of Pens And Equipments
Assumption On Calculation =

$$= \frac{67,200 + 1,400}{10 \text{ years}}$$

$$= \text{Rs } 6,860.00$$

c) Total Salvage Value At The End Of 10 Years

$$= \text{Rs } 440,730.00$$

CASH INFLOW

SALES	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
1. Females (Rejection)	-	-	24,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
2. Male (BN 50%)	-	-	-	-	-	-	-	-	-	-
3. Rams	-	110,160	110,760	123,120	123,120	123,120	123,120	123,120	123,120	123,120
4. Females	-	109,900	74,025	74,550	74,550	74,550	74,550	74,550	74,550	74,550
5. X Dropping	5,419	5,732	6,033	6,033	6,033	6,033	6,033	6,033	6,033	6,033
6. Salvage Value 10 years	-	-	-	-	-	-	-	-	-	440,730
	5,419	225,792	214,818	233,703	233,703	233,703	233,703	233,703	233,703	674,443

X For dropping : An average sheep produce
 (ex - pens price) 100 gm x 365 day x 10.04 / kg
 = \$ 3.46 / head / yearly

CASH FLOW

SALES	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
1. Fixed Capital Investment (552,600)	-	-	-	-	-	-	-	-	-	-	-
2. Cash Inflow	-	5,419	225,792	214,818	233,703	233,703	233,703	233,703	233,703	233,703	233,703
Silvage Value											440,730
3. Cash Outflow											
a) Fixed Cost	-	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500	36,500
b) Variable Cost	-	51,968	54,964	57,848	57,848	57,848	57,848	57,848	57,848	57,848	57,848
c) Purchasing Of Male (DH 50%)			2,400	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
	0	88,468	93,864	95,548	95,548	95,548	95,548	95,548	95,548	95,548	95,548
4. Nett Cash Flow	(552,600)	(83,049)	131,928	119,270	138,155	138,155	138,155	138,155	138,155	138,155	578,885

Pay back period = 6 years

Benefit = \$ 1,659,013.00

Cost = (\$635,649.00)

 Computing Of NPV (DF = 10 %)

Year	Profit	Discount Factor 10 %	Present Value At 10 %
0	(552,600)	1.0000	(552,600)
1	(83,049)	0.9090	(75,492)
2	131,928	0.8264	109,025
3	119,270	0.7513	89,608
4	138,155	0.6830	94,360
5	138,155	0.6209	85,760
6	138,155	0.5645	77,988
7	138,155	0.5132	70,901
8	138,155	0.4665	64,449
9	138,155	0.4241	58,592
10	138,155	0.3855	53,259
NPV =			75,871

 Computing Of NPV (DF = 18 %)

Year	Profit	Discount Factor 18 %	Present Value At 18 %
0	(552,600)	1.0000	(552,600)
1	(83,049)	0.8475	(70,384)
2	131,928	0.7181	94,737
3	119,270	0.6086	72,588
4	138,155	0.5158	71,260
5	138,155	0.4371	60,388
6	138,155	0.3704	51,173
7	138,155	0.3139	43,367
8	138,155	0.2660	36,749
9	138,155	0.2255	31,154
10	138,155	0.1911	26,401
NPV =			(135,167)

Computing Of NPV (DF = 10 %)

Year	Profit	Discount Factor 10 %	Present Value At 10 %
0	(552,600)	1.0000	(552,600)
1	(87,201)	0.9090	(79,266)
2	125,332	0.8264	103,574
3	113,305	0.7513	85,126
4	131,248	0.6830	89,642
5	131,248	0.6209	81,492
6	131,248	0.5645	74,089
7	131,248	0.5132	67,356
8	131,248	0.4665	61,227
9	131,248	0.4241	55,662
10	131,248	0.3855	50,596

NPV = 36,901

Assumption on the decreasing of 5 % total revenue

Computing Of NPV (DF = 18 %)

Year	Profit	Discount Factor 18 %	Present Value At 18 %
0	(552,600)	1.0000	(552,600)
1	(87,201)	0.8475	(73,903)
2	125,332	0.7181	90,001
3	113,305	0.6086	68,957
4	131,248	0.5158	67,698
5	131,248	0.4371	57,369
6	131,248	0.3704	48,614
7	131,248	0.3139	41,199
8	131,248	0.2660	34,912
9	131,248	0.2255	29,596
10	131,248	0.1911	25,081

NPV = (163,075)

Annexure 11

Financial Analysis

$$\begin{aligned} \text{IRR} &= 10 + \left(\frac{75,871}{75,871 + 135,167} \right)^{10} \\ &= 10 + \left(\frac{75,871}{211,038} \right)^{10} \\ &= 10 + (0.359)^{10} \\ &= 10 + (3.59) \\ &= \underline{\underline{14\%}} \end{aligned}$$

PROFIT AND LOSS ACCOUNT

SALES / EXPENDITURE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Revenue	5,413	225,792	214,818	233,703	233,703	233,703	233,703	233,703	233,703	233,703
Expenditure	98,468	95,854	95,548	95,548	95,548	95,548	95,548	95,548	95,548	95,548
Profit / (Loss) before Depreciation	(83,045)	131,938	119,270	138,155	138,155	138,155	138,155	138,155	138,155	138,155
Depreciation (of 10 years)	6,860	6,860	6,860	6,860	6,860	6,860	6,860	6,860	6,860	6,860
Profit / (Loss) after Depreciation	(89,909)	125,068	112,410	131,295	131,295	131,295	131,295	131,295	131,295	131,295
Interest on loan (Rate 6 %)	-	36,099	36,099	36,099	36,099	36,099	36,099	36,099		
Loss Repayment	-	75,206	75,206	75,206	75,206	75,206	75,206	75,206		
Nett Profit Before Tax	-	13,763	1,105	19,990	19,990	19,990	19,990	19,990	131,295	131,295
Conclusive Nett Profit Before Tax	(89,909)	(75,146)	(75,641)	(55,051)	(35,061)	(15,071)	4,919	24,909	156,204	287,491

Year	Fixed Cost	Wisc Pens	Depreciation	Interest	Total Fix Cost	Variable Cost	Purchasing Or Panels and Mals (OH 50%)	Total (Variable) Cost
1	36500	60500	6060		111960	50112	404000	534112
2	36500		6060	36099	79459	50001		59001
3	36500		6060	36099	79459	55782		55782
4	36500		6060	36099	79459	55782		55782
5	36500		6060	36099	79459	55782		55782
6	36500		6060	36099	79459	55782		55782
7	36500		6060	36099	79459	55782		55782
8	36500		6060	36099	79459	55782		55782
9	36500		6060		49360	55782		55782
10	36500		6060		49360	55782		55782
					754893	549369	404000	1433369

$$BEQ = \frac{FC}{P - TVC}$$

$$P - TVC$$

754893

$$= \frac{754893}{123.75 - (\frac{10033369}{47694})}$$

$$123.75 - (\frac{10033369}{47694})$$

47694

$$= \frac{755,493}{123.75 - (246.56)}$$

$$123.75 - (246.56)$$

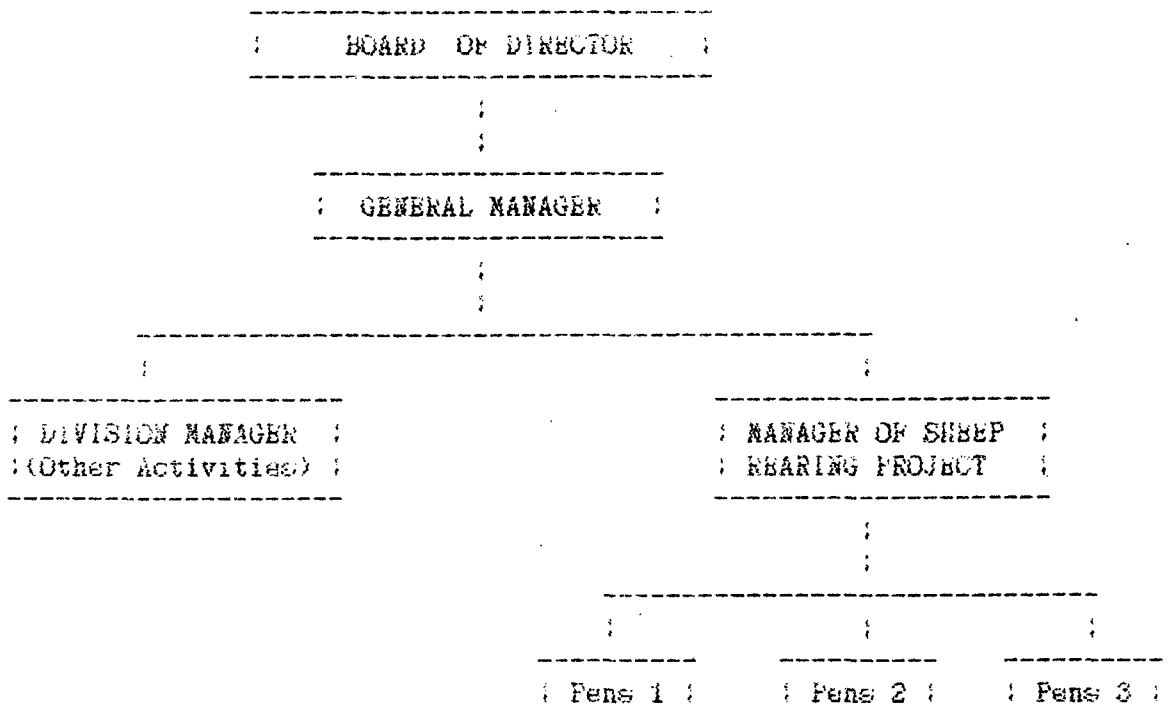
$$= \frac{755,493}{122.81}$$

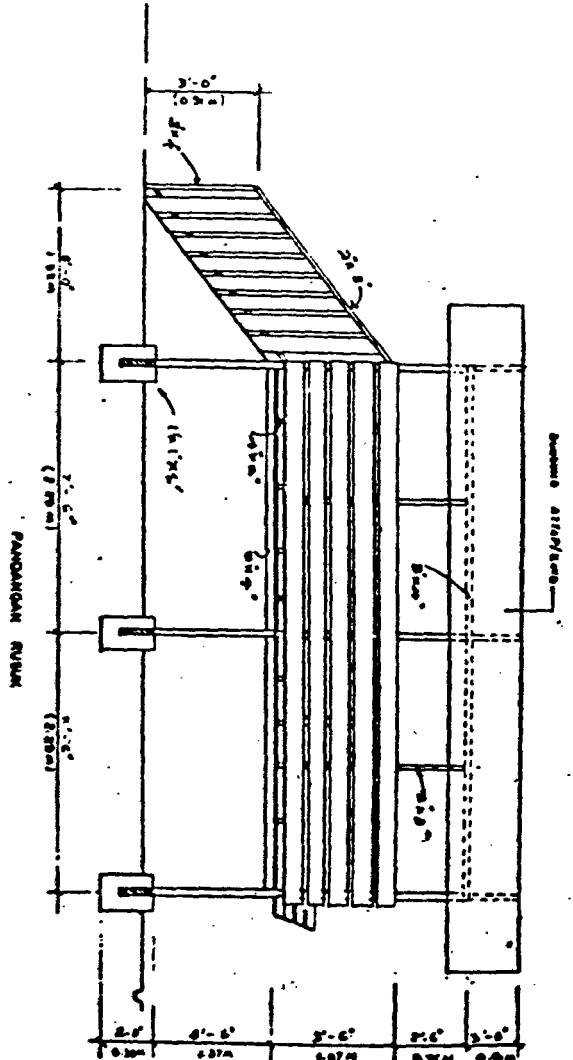
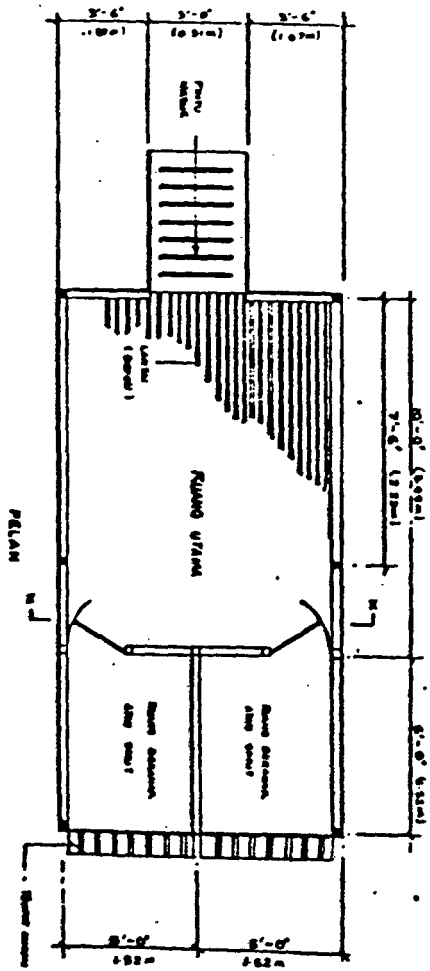
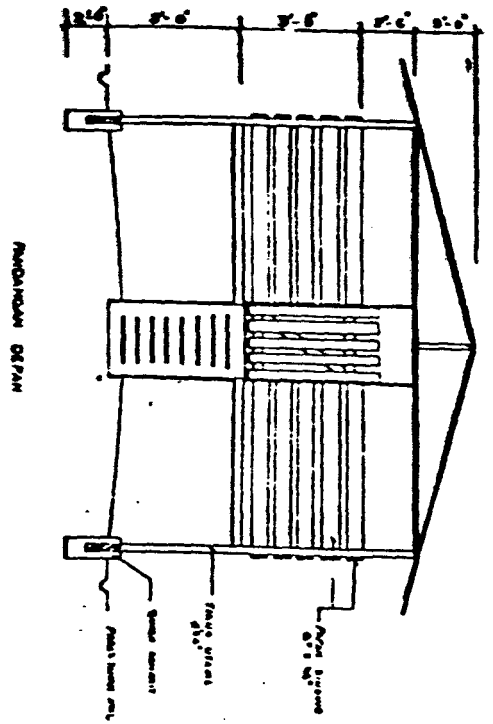
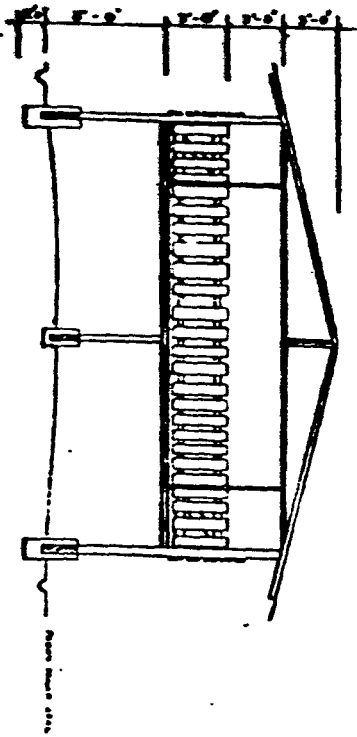
122.81

$$= 6,152 \text{ units}$$

=====

ORGANISATION CHART OF BOARD DIRECTOR
AND PROJECT MANAGEMENT





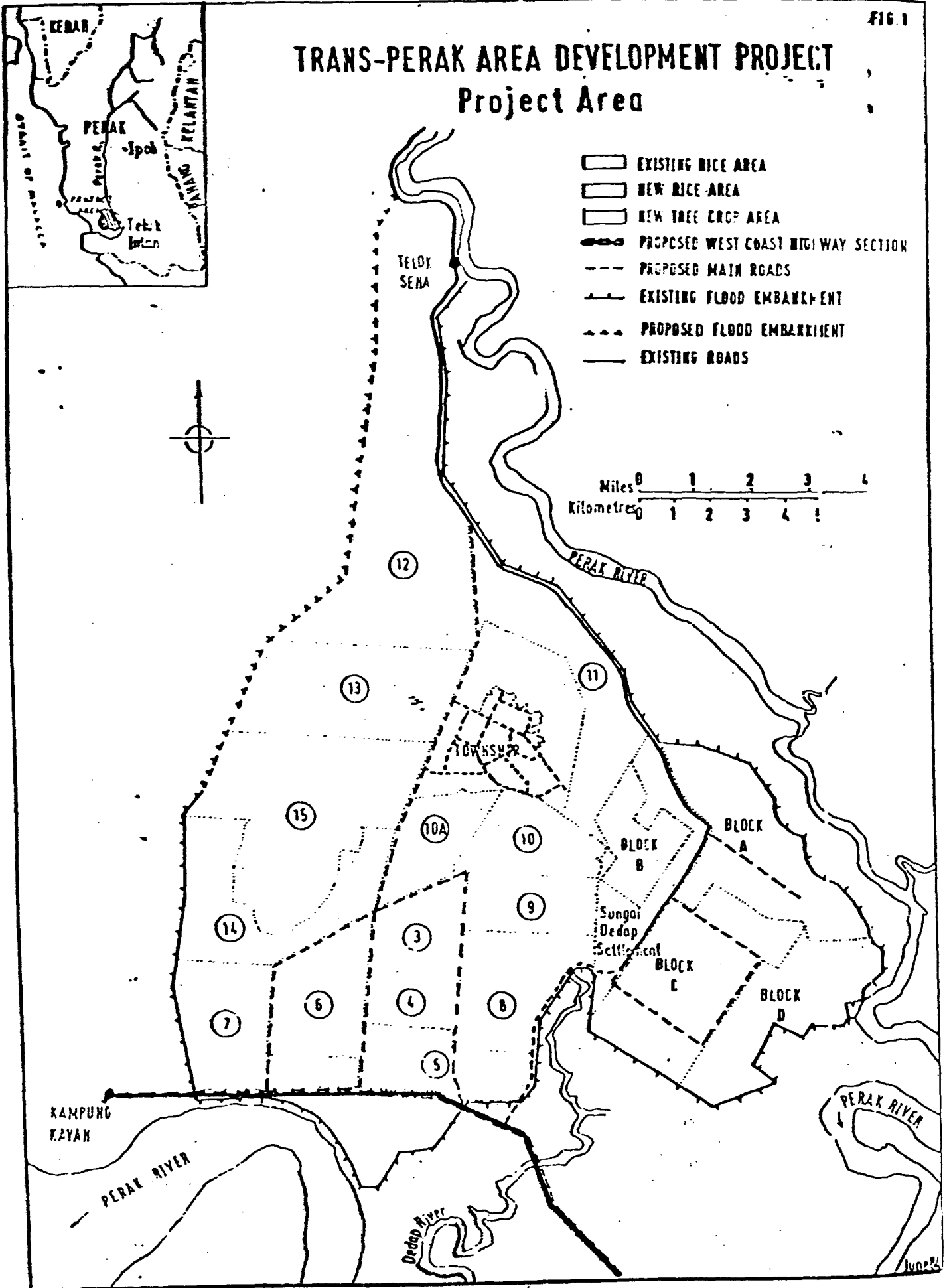
Salah seorang ahli tenaga
KESEKUTERAAN
 dan tenaga ahli tenaga.

INSTITUT PENYELIDIKAN SAINS MALAYSIA	PELAN KANDANG BUN BUN
ALAM, tanah/bangunan	

FIG. 1

TRANS-PERAK AREA DEVELOPMENT PROJECT

Project Area



Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: COTTON GINN-PRESS AND OIL EXTRACTION MILL
<i>COUNTRY</i>	: PAKISTAN
<i>PROJECT PREPARED BY</i>	: ISLAM MADNI

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

Headquarters:

Route des Morillons 15
CH-1218, Le Grand Saconnex
Geneva, Switzerland

Regional Office for Asia & the Pacific

'Bonow House'
43 Friends Colony (East)
New Delhi 110 065, India

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ACKNOWLEDGEMENT

- i) The fifth ICA/Japan course for strengthening management of agricultural Co-operatives in Asia was a very good opportunity in understanding the concept of integrated co-operatives and the management for me.
- ii) It has given me a good chance to understand various aspects of agricultural co-operatives of South East Asian countries. The course is more interested in the ways of increasing farmer's income through value addition by using time, place and form factors.
- iii) The cotton ginn - press & oil mill project of national co-operative supply corporation was prepared under this course programme.
- iv) For giving me this valuable opportunity, I would like to express my gratitude to the staff members of I.C.A.R.O. in New Delhi and the professors of I.I.M. Ahmadabad and specially to project director Mr. M.V. Madane.
- v) I am also thankful to the management of NCSC who gave me a chance to participate in this course specially Vice President Ch. Mohammad Sarwar Khan.

ISLAM MADNI

January, 1991.

1. SUMMARY

1.1

This project deals in cotton Ginn-Press & Oil Mill to be constructed at Sheikh Fazal a village about 250 Km Southern area of Lahore the second largest city of Pakistan.

1.2 OBJECT

To increase the small farmers income through integrated co-operative management which is not existing in the area proposed for the project.

1.3 PROMOTOR

National co-operative supply corporation (NCSC) will act as promotor of project and later on cotton growers co-operative society will be formed to take over the project.

1.4 LOCTION

Sheikh Fazil a village situated about 250 Km in southern area of Lahore.

1.5 RAWMATERIAL

COTTON (Kappas)

1.6 OUTPUT

- i) Cotton lint
- ii) Refined cotton seed oil
- iii) Oil Cake
- iv) By product Oil Dirt

1.7 . OPERATION PERIOD

Days : 125 (Seasonal activity)

1.8 CAPACITY OF PLANT

- 1) Cotton Ginning Pressing 27000 M/T
- 2) Cotton Seed Crushing 17000 M/T

1.9 CAPITAL COST (Rs. 000)

- 1) Land Rs. 1000
- 2) Building Rs. 3650
- 3) Machinery Rs. 7400
- 4) Others Rs. 7427

1.10 FINANCING

- 1) NCSC Share 30% 5843 (Thousand) Interest Rate 15%
- 2) Banks Loan 70% 13634 (") " 12%

1.11 PROJECT LIFE

The project life is assumed to be ten years and one year will be required for construction of project.

1.12 PRODUCTION PLANNING

YEAR	1	2	3	4	5
Capacity Utilisation	70%	80%	90%	100%	100%

1.13 OBJECTIVES OF PROJECT

The main object of the project is to increase the income of small farmers through integrated co-operative system and to create the source of income for landless persons living in the country side. These objectives will be achieved in the following ways :-

1) Backward Linkages

To increase per acre yield which is not higher presently and reduce the cost of production.

2) Forward Linkages

- i) To procure the production of all members for value addition after processing
- ii) Better marketing to earn maximum profit by using organisational structure of co-operative and management.

- iii) To eliminate the middleman who is involved in cotton trade at the cost of growers.

3) HORIZONTAL LINKAGES.

To come into export of cotton lint through NCSC to earn the maximum profit for the benefit of members.

1.14 FINANCIAL ANALYSIS

1. Pay Back period : 3years
2. Break even point(First year) 13350 M/T
3. NPV Rs. 24557 (Thousand)
4. I.R.R. 36.25 %
5. B.C.R. 2.26
6. Increase Income to growers : Rs. 240 per M/T

II. BACK GROUND

2.1.1 COTTON AND PAKISTAN :

Cotton crop is now back bone of country's economy as export of lint, cotton yarn, cotton cloth and cotton garments is main source of foreign exchange earnings. The textile industry is developing sector which is providing employment opportunities to maximum labour of the country in addition to source of foreign exchange earnings. The production of cotton is increasing every year as under :

Year	Production in Bales
1985 - 86	7059910
1986 - 87	7631976
1987 - 88	8262910
1988 - 89	8203175
1989 - 90	8439393

2.1.2 TEXTILE INDUSTRY DEVELOPMENT

Basically Pakistan is an agricultural country and Government policies favour to develop such industries which are oriented to local raw material consumption. So, under the policies of Govt. textile industry has expanded to a large extent during the recent years. The following data show progress of textile sector :-

Year	No. of Units	Spindles (000)	Rotors (000)	Looms (000)
1985 - 86	160	4422	37	19

1986 - 87	187	4292	48	17
1987 - 88	197	4330	55	16
1989 - 90	262	5110	71	16
WORKING CAPACITY:		4304	65	9

2.1.3 FUTURE DEMAND

The stable prices of cotton crop and regular supply of cotton lint is very important for the Govt. to increase the cotton production to boost up the textile industry as well as export of cotton yarn and lint to earn the foreign exchange. Due to expansion of textile industry and increase of international demand, the demand of cotton lint is increasing year to year as under :

Year	Local Industry, CEC Purchase Purchase (in bales)	Exporters Purchase (Bales)	(Bales)
1985 - 86	2664498	4100135	209196
1986 - 87	3828834	3539708	25601
1987 - 88	4424504	"	3624504
1988 - 89	4731150	1645315	1697605
1989 - 90	6543409	442758	833713

2.2 AREA OF PROJECT

2.2.1 LOCATION :

The project area is located in district Vehari about 250 Km in the south of Lahore and Faisalabad cities which are the main centres of textile industry. The project will be established at village "Sheik Fazil" situated at a distance of

20 K.M. from the main high way road of the country.

2.2.2 AREA OF OPERATION

The area proposed for operation is consisting of 150 villages within the radius of ten miles from anchor activity.

2.2.3 POPULATION

The households of this area are 18750 with a population of 112500. The farmer households are 13125 about 70% and farmers are 30070.

2.2.4 LAND PATTERN

The area is plain, land is fertile, well irrigated and climate is suitable for cotton growing. The total area is 2.5 lakh acres of which approximately 10% is waste land and remaining 2.25 lakh acres are available for cultivation of various crops.

2.2.5 CLIMATE

- i) Lowest Temperature 10C
- ii) Highest Temperature 47 C
- iii) Rainfall Occasional

2.2.6 MAJOR CROPS

- i) Winter Crops : Sugarcane, paddy, maize and cotton
- ii) Summer Crops : Wheat, barley.

2.2.7 COTTON VARIETIES GROWN

Only one crop is harvested in a year which is sown in the month of May and June and harvesting is started in October and completed in January. The following varieties are sown in the area :-

- i) Nayab - 78 (early variety)
- ii) B - 557 (late variety)
- iii) MNH - 93 (late variety)

2.2.8 MAJOR PRODUCTION (IN M/T)

Year	Wheat	Paddy	Maize	Sugarcane	Cotton
1985 - 86	83500	23150	19200	560000	65500
1986 - 87	87900	19170	17500	465000	69700
1987 - 88	93250	25450	21500	479000	75800
1988 - 89	92700	31190	20100	435000	85200
1989 - 90	84000	32000	25650	427000	90280

2.2.9 LAND HOLDING PATTERN

The farmers of proposed area have small holding and pattern is as under :

Size of Holding in Acres %	No. of Farmers
3 - 5	20% 6000
6 - 8	50% 15000
9 - 10	27% 8000

2.2.10 EXISTING MARKETING SYSTEM

The surplus are marketed through commission shops in the nearest market or crops are purchased at the farm gate by the private traders. A reasonable amount is going in the pocket of commission agents and traders as co-operative marketing system is not existing in the area.

2.2.11 PROCESSING FACTORIES

1) The area of operation is without cotton ginning factory and total production of cotton is shifted either to nearest markets or ginning factories which are located at a distance of 20 K.M.

2) Ginning factories operating near the project area are owned by the individuals and no co-operative ginning factory is working within the area of 150 K.M. from the anchor place.

2.2.12 PROBLEMS OF FARMERS

1) Need of backward linkage for supply of agricultural inputs to reduce the cost of production and to increase the per acre yield of cotton.

2) To eradicate the middlemen who are involved in the marketing of cotton crop and supply of inputs.

3) To ensure the remunerative prices of cotton crop during the crises period.

4) Prompt payment and benefit of value addition through forward linkages after processing. ird

2.2.13 JUSTIFICATION FOR PROJECT

The main objective of project is to increase the income of members who are suffering due to small land holding, limited resources, individual bargaining and lack of informations regarding new techniques and research to increase the yield. The project will achieve the following successes :-

1) Through backward linkages per acre yield of cotton can be increased upto 30 maunds which is only 20 maund presently and income of farmer would be increased to a large extent.

2) Cost of production can be reduced to a reasonable extent by supply of all inputs at reduced prices which is now higher due to involvement of middle men.

3) A reasonable portion of farmers income which is taken away by the commission agents and traders will be saved and passed on to members as purchase price of raw material.

4) Financial benefits of integrated marketing and value addition of processing will be passed on to member farmers which they are not availing at present.

5) Employment opportunities will be provided to persons living in the village side.

- 6) Other social welfare activities will be started by the society.

111 PROJECT OF COTTON GINNING - PRESSING & OIL MILL

3.1 OBJECTIVES

The main object this project is to increase the income of member farmers and service expansion. The detailed objectives are as follows :

1) To establish backward linkages for supply of all sort of agricultural inputs, financial support and provision of scientific farming skill to increase the per acre yield.

2) To reduce the cost of production by supply of agricultural inputs through integrated co-operative supply system.

3) To establish forward linkages for planned production and marketing of raw material produced by the members to get the maximum return after value addition for members.

4) To reduce the marketing costs such as middlemen commission, transportation and other hidden losses.

5) To return of profits to members earned through new system of processing and marketing.

6) To provide job opportunities to idle labour for creation of non farm income in the country side.

3.2 AREA OF OPERATION

The project will be constructed at village SHEIKH FAZIL and raw material will be procured within the radius of ten miles from member farmers.

3.3 PROJECT COMPONENTS

1. Project Construction

The factory, with the daily capacity 216 M/T of cotton ginning pressing and 136 M/T of cotton seed crushing will be constructed within a period of one year with cost of Rs. 19477 thousand.

2. Procurement of Raw material

In the earlier two or three years, raw material will be procured from the farmers of the area who are producing at present 91000 M/T cotton against our requirement of 18900 and 21600 M/T in the first and second year of operation.

Later on cotton growers co-operative society will be formed in the area and raw material will be purchased from the members only. Out of 30000 farmers existing in the area, membership of 7500 farmers is proposed who can allocate 34000 acres of land for cotton cultivation to be supplied to society under the terms and conditions of by laws. The average yield per acre of the area is 20 maund cotton.

3. Processing

The cotton ginning-pressing and oil expelling is a simple process and specially high skilled techniques are not necessary for this process. The required machinery is manufactured locally except one component "LINT

CLEANER" which will be imported from U.S.A. The skilled seasonal labour is also available to run the machinery.

4. Marketing

- i) Due to increase in the local as well as international demand, marketing of cotton lint will not face any problem. At present, three main agencies, textile mills, cotton export corporation of Pakistan, private exporters, are purchaser of cotton lint which is purchased at factory gate at prevailing rates.
- ii) In fact, export price of lint normally remains 40% higher as compared to local price and society will establish its horizontal linkages with NCSC to export its production to increase the member income.
- iii) Cotton seed oil will be sold to vegetable Ghee industry which is depending for raw material requirement upon the production of cotton seed oil. The country is producing only 25% of total consumption and remaining 75% raw material for industry has to be imported.
- iv) Oil cake is the most popular and rich fodder for milch animals and sale will be made to traders who are in this business.
- v) By product, oil dirt will be sold to soap industry to be used for preparation of soap.

5. EXTENSION SERVICES

The society will establish member services department to achieve the objectives through integrated co-operative system.

IV. DETAILS OF OPERATION

4.1 CAPACITY OF THE PROJECT

The project will produce the following products daily :

- 1) Cotton Lint 400 (Bales) (70 M/T)
- 2) Cotton seed Oil 13 M/T
- 3) Oil Cake 117 M/T

4.2 LOCATION

The project will be constructed at village SHEIKH FAZIL about 250 K.M. in the South of Lahore situated at melted road and away 20 K.M. from the national Highway. The other necessary infrastructure is also available for erection of project.

4.3 MAIN PRODUCT.

- 1) Cotton lint.
- 2) Refined cotton seed oil
- 3) Oil Cake.

BY PRODUCT

- 1) Cotton lint (inferior quality)
- 2) Oil Dirt

4.4 PROCESSING GINNING FACTORY

1. COTTON PRE-CLEANING:

Cotton is sucked from heaps lying in the compound of factory by the separator machine and passes through opener machine to remove leaves, cotton pods, sticks and small stones etc.

2. GINNING CLEANING :

After first process of cleaning, cotton is sucked by the SAW GINNING machine and passes through second cleaner machine to remove the remains of first process.

3. SAW GINNING OF COTTON.:

After second process of cleaning cotton is ginned by saw ginning machine and cotton lint and cotton seed is separated in this process.

4. LINT CLEANING :

Before pressing cotton lint is passed through lint cleaning machine, a new technology, at its final stage to clean it from all sort of foreign matter whatsoever.

5. PRESSING :

After final process of cleaning lint passes to automatic Hydraulic press where it is pressed and packed in hussein cloth and baling hoops in shape of bale of 175 K.G. approximately.

OIL MILLS :

1. EXPELLER MACHINE ;

After ginning process, cotton seed is transfered to oil mill automatically through conveyor system where it is weighed with electronic scale before passing into expeller machine. The cotton seed is crushed in this machine and crude oil and oil cake is produced. Crude oil is stored in tanks for refining and oil cake is shifted to stores for sale.

2. REFINING OF CRUDE OIL ;

Crude oil is shifted to refinery and refined with chemical and heating process. Crude oil produces oil dirt in process of refining as by product.

4.5 CONSTRUCTION PERIOD (APPENDIX-3)

Construction of the project will be completed within one year and the steps will be land purchase, placing order for supply of machinery, layout, building construction, installation of machinery electric fitting and test operation.

4.5 MACHINERY AND EQUIPMENTS

Cotton Ginning - Pressing and Oil expelling is a simple process and labour consuming also. The machinery and equipments are locally manufactured and available easily on order except lint cleaning machine which is imported

S. No	Item	Unit	Remarks
1.	Land	6	Acres
2.	Building Office	2184	Covered area Square Feet
	Building Parts Store	672	"
	Production Hall Ginning	4800	"
	Production Hall Oil Mill	4375	"
	Storage Oil cake	8750	"
	Labour Quarters	4000	"
3.	Machinery		
	Saw ginning	8	Machines
	Press	1	Automatic Hydraulic
	Lint Cleaner	1	Imported Machine
	Expellers	20	for Crushing Cotton seeds
	Refinary	2	For Oil Refining
	Storage Tanks	7	Crude & Refind Oil Storage
	Staff Jeep and Truck	2	

150
 110
 1500 \$
 1900
 2250
 2250

4.6 INVESTMENT

4.6.1 Capital Cost of the Project

The Capital Cost of this project is estimated on the basis of prices of 1991 year as under:-

S. No.	Item	Cost (Rs. 000)	Remarks
1.	Land	1000	
2.	Building	3650	
3.	Ginning Machinery	3750	
4.	Oil Mill Machinery	1650	
5.	Oil Mill Machinery		
6.	Electrification	2000	
7.	Equipments	220	
8.	Vehicles	700	
9.	Cost of Layout	245	(2% of 1 to 6)
10.	Pre Operating Exp.	1067	(As per 4.6.2)
11.	Contingencies	428	(3% of 1 to 9)
12.	Margin Money	4767	(As per 4.6.3)
	Total	19477	

4.6.2. PRE-OPERATING EXP.

S. No	Item	Cost (Rs. 000)	Calculations
1.	Project Manager Salary	96	Rs. 8000 PM x 12
2.	Interest on land	129	Rs. 1000 x 12.9%
3.	Interest	742	Rs. 11515 x 12.9 x ¹ / ₂
	i) Building		
	ii) Machinery		
	iii) Electrification		
	iv) Equipments		
	v) Layout		
4.	Admm Exp.	100	Misc. expenses during construction
	Total	1067	

4.6.3 WORKING CAPITAL

The working capital for the first year has been calculated as follows on the basis of data and informations collected from the existing units operating in 1991 and future demand.

S.No.	Item	Cost (Rs. 000)	Calculations	Remarks
1.	Raw Material Ginning Factory	10769	$18900 \text{MT} \div 125 \times 8 \times 8900$	8 days
2.	Finished Goods	3375	$5954 \text{MT} \div 125 \times 3 \times 23600$	3 days
3.	Raw Material Oil Mill	666	$18900 \div 125 \times 3 \times 8900 - 3375$	3 days
4.	Ginning & Crushing Exp.	1080	$18900 \div 125 \times 11 \times 650$	11 days
	TOTAL	15890		
	Source			
1.	From own Funds	4767	30% from margin money	
2.	From Banks	11123	70% from banks	
	Total	15890		

4.6.4 FUND RESOURCES

- 1) NCSC investment as promoter of project 30% of capital cost Rs. 5843 thousand at interest rate of 15% per annum with the repayment period of ten years excluding one year of construction as grace period.
- 2) Borrowing from Federal Bank for Co-operatives or other financial institutions Rs. 13634 thousand at interest rate of 12% per annum with repayment period of ten years excluding construction period of one year.

4.7 PRODUCTION PLAN AND RAW MATERIAL REQUIREMENTS

The project will be operated in the following capacity utilisation programme and will work at full capacity in the fourth year.

S.No.	Item	Year 1	2	3	4	Remarks
1.	Capacity utilisation	70%	80%	90%	100%	In fourth year working at 100% capacity
2.	Cotton	18900	21600	24300	27000	M/T. Cotton for Factory
3.	Cotton Seed Production	11932	13636	15340	17045	M/T. R. M for Oil Mill
4.	Production In Bales	35000	40000	45000	50000	one bale of 175 K.6 approximately

4.8 YIELD RATIOS

After collecting the yield data from the existing factories and discussion with the experts of this trade, minimum yield ratios have been assessed for operational results which are as under

S.No.	Item	Yield %	Remarks
	<u>GINNING FACTORY</u>		
1.	Cotton Lint I	31.50	After lint cleaning Process
2.	Cotton Seed	63.13	
3.	Cotton Lint II	0.80	Waste of lint cleaning process
4.	Waste	4.57	shortage of ginning process
	Total	100%	
	<u>OIL MILL</u>		
1.	Refined Oil	9.40	
2.	Oil Cake	85.60	
3.	Oil Dirt	0.65	by product
4.	Waste	4.35	Shortage of Oil Mill process
	Total	100.00	

4.9 OUTPUT :

The project will operate at full capacity in fourth year and the output will be same for the subsequent years. The production of each product for the first four years is as follows.

(UNIT M/T)

S.No.	Product	Year I	2	3	4	5
1.	Cotton lint I	5954	6804	7655	8505	8505
2.	Cotton lint II	151	173	194	216	216
3.	Refined Cotton Seed Oil	1122	1282	1442	1602	1602
4.	Oil Cake	10214	11672	13131	14590	14590
5.	Oil Dirt	78	89	100	111	111

4.10 RAW MATERIAL AND OUTPUT PRICES

The purchase price of raw material and selling prices of output have been estimated after considering prevailing prices of 1991 and future trends which are expected. The results are based on the following prices. The export price of lint has not been accounted for to avoid over estimation.

(UNIT M/T)

S.No.	Item	Purchase Price	Selling Price	
1.	Cotton (Kappas)	Rs. 8900		
2.	Cotton lint (best quality)		Rs. 23600	
3.	Cotton lint (No II)		2000	
4.	Refined Oil		14000	
5.	Oil Cake		2800	
6.	Oil Dirt		3500	
7.	Export Price of lint (Fob)		34000	

4.12 PROJECT IMPLEMENTATION

The project will be implemented by NCSC and later on cotton growers co-op society is proposed to be farmed to take over the project.

4.13 SEASON OF CROP AND OPERATION :

- 1) HARVESTING OCTOBER TO JANUARY
- 2) WORKING PERIOD 125 (days) (THREE SHIFT BASIS)

S.No.	Name of Month	W. Days
1	October	10
2	November	25
3	December	25
4	January	25
5	February	25
6	March	15
	TOTAL	125

V: ORGANISATION AND MANAGEMENT

5.1 MANAGMENT POLICY

This project will be promoted by NCSC and management policy, for the period project is operated by NCSC will be determined by the managing committee of NCSC and after handing over the project to society to be formed for this purpose, project will be operted under the guidance and directions of managing committee of society.

Since the project is to be taken over by cotton grower co-operative society, NCSC will set up a separate organisational structure to develop the managerial skill to be utilised by the society after its formation. The present management will work on the following guide lines for formation of society.

1. The society will work on pooling basis and after deduction of admn expenses, whole profit will be returned to growers.
2. Society will supply all agricultural imputs to members and extension services also to increase the per acre yield.
3. Society will be responsible to lift the whole production of members and make cash payment 75% of purchases and remaining at the end of season after adjustment of credit due and profit of operation.
4. Each member will be bound to allocate at least one acre of land for cotton cultivation and bring his production to society.

5. At the first stage 7500 farmers will be registered as members out of 50000 existing farmers covering 34000 acres of land for cotton growing. The following pattern of membership is proposed.

Land holding	Members	Allocation	Total Acres
3-5	1500	2	3000
6-8	2500	4	10000
9-10	<u>3500</u>	6	<u>21000</u>
TOTAL	7500		34000

5.2 ORGANISATIONAL STRUCTURE (APPENDIX-5)

A separate organisation will be set up for this project operation and project manager will be directed by the board of directors of NCSC. The summarised operational functions are as follows.

- 1) Procurement
- 2) Production
- 3) Marketing
- 4) Administration
- 5) Accounts
- 6) Planning & Extention

5.4 TASKS OF EACH DEPARTMENT

1. PROCUREMENT

- i) Purchase of raw materials for production.

- ii) Purchase of inputs for members

2. PRODUCTION

- i) Production planning and production
- ii) Maintenance of machinery
- iii) Supervision of seasonal labour
- iv) Yield and quality control.

3. MARKETING

- i) Marketing of all products in the local market.
- ii) Export of lint.
- iii) Storage Planning
- iv) Market survey and planning

4. ADMN

- i) General adminsitration
- ii) Transportation
- iii) Co-ordination
- iv) Mambership record

5. ACCOUNTS

- i) Accounts & internal audit
- ii) Receipts and payments
- iii) Inventory control

6. PLANNING & EXTENSION

- i) Promotional work for membership
- ii) Supply of all inputs and extension services to members.
- iii) Member education, motivation & training.

VI FINANCIAL ANALYSIS

6.1 ASSUMPTIONS :

Financial analysis has been set forth under the following main assumptions.

1. Project life has been assumed ten years excluding one year construction period and analysis for ten year has been shown.
2. Investment is completed by the end of construction year in various phases. Interest on land for full year, building, machinery and other capital expenditure has been charged for six month on average withdrawal basis.
3. Production and overhead cost is based on data and informations collected from the existing units in 1991.
4. Fixed expenditure are constant cost and variable cost is changing according to production.

5. Depreciation has been charged according to service life of each asset on straight line method.

6. Salvage value has not been accounted for as depreciation has been charged according to service life of assets.

7. Sale realisation of cotton lint at local market prices has been calculated and export price which 40% higher at the time of preparation of project report has not been added in the sale revenues.

8. Provision for income tax has not been made as society will work on pooling basis and whole profit will be distributed among members in shape of price of raw material.

(6.2)

VARIABLE COST FOR EACH YEAR

(Rs. 000)

Item	1 Year	2	3	4	5	6	7	8	9	10
Ginning Factory	174783	199752	224721	249690	249690	249690	249690	249690	249690	249690
Oil Mill	2941	3361	3781	4201	4201	4201	4201	4201	4201	4201
TOTAL	177724	203113	228502	253891	253891	253891	253891	253891	253891	253891

VARIABLE COST OF FIRST YEAR

(6.2.1)

(Rs. 000)

S.No.	ITEM	COST	CALCULATIONS	REMARKS
	GINNING FACTORY			
1.	Raw Material	168210	18900 M/T x 8900	70 % Capacity
2.	Labour Ginning/Pressing	280	35000 Bales x 8	
3.	Packing Charges	2170	35000 x 62	
4.	Repair & Maintenance	105	35000 x 3	
5.	Electricity	2289	625 x 6105 M/T + 20% x 1/2	
6.	Loading unloading	105	35000 x 3	
7.	Wages	51	72800 ÷ 50000 x 35000	
8.	Hussein Cloth	50	50000 x 1	
9.	Selling Exp.	420	0.30% of sales of lint	
10.	Interest on working capital	1103	At rate of 17%	For seven months
	TOTAL	174783		
	OIL MILL			
1.	Wages	302	431 x 70%	
2.	Repari & Maintenance	150	Estimated on the basis of actual	
3.	Oil Refining	200	Estimated on the basis of 1991	
4.	Electricity	2289	1/2 on the basis of Motors H.P	
	TOTAL	2941		
	G. TOTAL	177724		

WORKING CAPITAL REQUIREMENTS

(6.2.2)

(Rs. 000)

	1 Year	2	3	4	5	6	7	8	9	10
CAPACITY	70%	80%	90%	100%	100%	100%	100%	100%	100%	100%
FUNDS REQUIRED	11123	12712	14301	15390	15890	15890	15890	15890	15890	15890
INTEREST 17% (For 7 month)	1103	1260	1418	1576	1576	1576	1576	1576	1576	1576

FIXED COST FOR EACH YEAR

(6.3)

(Rs. 000)

ITEM	1 Year	2	3	4	5	6	7	8	9	10
ADMN. EXPENSES	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545
GINNING FACTORY WAGES	373	373	373	373	373	373	373	373	373	373
OIL MILL WAGES	170	170	170	170	170	170	170	170	170	170
SUB TOTAL	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
INTEREST OF INVESTMENT	2513	2261	2010	1759	1508	1257	1006	754	503	252
DEPRECIATION	818	818	818	818	818	658	658	658	658	658
TOTAL	5419	5167	4916	4665	4414	4003	3752	3500	3249	2798

Repayment Schedule For
 Long Term Loans
 Loan Amount 19477
 No. of Payment 10
 Grace Period 1 Year
 Rate of Interest 12.9%

(Rs. 000)

Year	Ammortization	Balance	Rate of Interest	Annual Interest	Repayment	Cumulative Repayment
1.	"	19477	12.90%	"	"	"
2.	1947	17530	"	2513	1947	1947
3.	1947	15583	"	2261	1947	3894
4.	1947	13636	"	2010	1947	5841
5.	1947	11689	"	1759	1947	7788
6.	1947	9742	"	1508	1947	9735
7.	1947	7795	"	1275	1947	11682
8.	1947	5848	"	1006	1947	13629
9.	1947	3901	"	754	1947	15576
10.	1947	1954	"	503	1947	17523
11.	1954	"	"	252	1954	19477

DEPRECIATION SCHEDULE

(Rs. 000)

(6.3.2)

S. No.	ASSETS	Cost	Ratio %	Allocation	Total Cost	Life	Depre- ciation
1.	Building	3650	30.50	531	4181	20	209
2.	Machinery	7400	61.82	1076	8476	20	424
3.	Equipments	220	1.84	32	252	10	25
4.	Vehicles	700	5.84	101	801	5	160
S. No.	TOTAL	11970	100	1340	13710		818
COST TO BE ALLOCATED							
1.	Cost of Layout	245					
2.	Pre-operating Express	1067					
3.	Contingencies	428					
	TOTAL	1740					

CASH FLOW CHART

(Rs. 000)

INVESTMENT	19477	1 Year	2	3	4	5	6	7	8	9	10
Sales		185396	211862	238351	264818	264818	264818	264818	264818	264818	264818
V. Cost		177724	203113	228502	253891	253891	253891	253891	253891	253891	253891
Contribution		7672	8749	9849	10927	10927	10927	10927	10927	10927	10927
Fixed Cost		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Net Cash Inflow		5584	6661	7761	8839	8839	8839	8839	8839	8839	8839
Margin Money		=	=	=	=	=	=	=	=	=	4767
Total Cash Inflow		5584	6661	7761	8839	8839	8839	8839	8839	8839	13606
Cumulative Cash Inflow	- 19477	- 13893	- 7232	+ 529	9368	18207	27046	35885	44724	53563	67169
Discounted Cash Inflow 13 %		4942	5216	5379	5421	4798	4245	3757	3325	2943	4008
Cumulative Discounted Cash Inflow	- 19477	- 14535	- 9319	- 3940	+ 1481	6279	10524	14281	17606	20549	24557

INTERNAL RATE OF RETURN

(6.4.1)

(Rs. 000)

YEAR	NET CASH INFLOW	36.5 %		36.25 %	
		Discount Rate	NPV	Discount Rate	NPV
0	-19477	-	-	-	-
1	5584	0.7326	4091	0.7339	4098
2	6661	.5367	3575	.5386	3587
3	7761	.3931	3051	.3953	3067
4	8839	.2880	2546	.2901	2564
5	8839	.2110	1865	.2129	1881
6	8839	.1546	1367	.1563	1381
7	8839	.1133	1001	.1147	1013
8	8839	.0829	733	.0841	743
9	8839	.0607	537	.0617	545
10	13606	.0445	605	.0453	616
TOTAL			19371		19495

6.5 1. **PAY BACK PERIOD**

- i) Pay back period 3 Years (per 6.4)
- ii) Discounted pay back period 4 years (as per 6.4)

2. **BREAK EVEN POINT (For first year)**

Fixed Expenditure ÷ contribution per unit

$$7672 \div 18900 = 0.4059 \text{ (Contribution per unit)}$$

$$5419 \div 0.4059 = 13350 \text{ M/T}$$

3. **Net present value** Rs. 24557 (Thousand as per 6.4)

- i) I.R.R. 36.25% (as per 6.4.1)
- ii) Benefit Cost Ratio 2.26 (44034 ÷ 19477)

4. **Benefit to Farmers (For ten years)**

Total contribution - Total fixed Exp. ÷ total R. Material purchase

$$102759 - 41883 = 60876000 \div 253800 = \text{Rs. 240 M/T}$$

5. **Financial Viability**

- i) On the basis of above financial analysis, the project can be said to be viable. Internal Rate of Return is 36.25% which is quite high considering the service life of the project which is more than 20 years in reality.
- ii) The above results have been calculated on the basis of local market prices while society will export cotton lint after exploring foreign market and income of the project can be enhanced from 20% to 40% keeping in view the export prices of lint.

VII. BUDGET FOR TEN YEARS

(Rs. 000)

Item	Year 1	2	3	4	5	6	7	8	9	10
Sales	185396	211862	238351	264818	264818	264818	264818	264818	264818	264818
V. Cost	176621	201853	227084	252315	252315	252315	252315	252315	252315	252315
F. Cost	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Total	178709	203941	229172	254403	254403	254403	254403	254403	254403	254403
EBIT	6687	7921	9179	10415	10415	10415	10415	10415	10415	10415
Interest on W. Capital	1103	1260	1418	1576	1576	1576	1576	1576	1576	1576
Interest on Loans	2513	2261	2010	1759	1508	1257	1006	754	503	252
Total	3616	3521	3428	3335	3084	2833	2582	2330	2079	1828
EBT	3071	4400	5751	7080	7331	7582	7833	8085	8336	8587
Repayment of Loans	1947	1947	1947	1947	1947	1947	1947	1947	1947	1947
Surplus	1124	2453	3804	5133	5384	5635	5886	6138	6389	6640
Cumulative Surplus	1124	3577	7381	12514	17898	23533	29419	35557	41946	48586
Margin Money	"	"	"	"	"	"	"	"	"	4767
TOTAL SURPLUS	"	"	"	"	"	"	"	"	"	53353

VIII. BENEFITS AND RECOMMENDATIONS

8.1 BENEFITS :

1. The project will increase the income of member farmers by using domestic raw material and specially by increasing the per acre yield which is low at present.
2. The project will generate on average added value of Rs. 6087 thousand for ten-year.
3. Permanent employment will be provided to 36 persons and 157 seasonal skilled and unskilled labours will be provided non farming source of income in the village side where no source of income is available to landless people.
4. The project can help industrialisation in the area.
5. The project can start social welfare activities in the area like education, medical and recreation facilities for the general public.

8.2 RECOMMENDATIONS

1. NCSC as promoter should give better service to farmers of the area to convince them for formation of cotton growers Co-operative society as early as possible.

2. From the very beginning NCSC should concentrate upon the export of cotton lint to enhance the value addition of raw material consumed by the project and for creating more surplus for the suppliers of raw material.
3. NCSC and Federal Bank for co-operations should support the project and rate of interest should be reduced from 15% to 10% and from 12% to 6% respectively.
4. Government should give grant to implement the project which has been designed for the upliftment of rural area.
5. Keeping in view the economic and social impact of the project on the rural and backward area where 200 persons will earn their livelihood, International donor agencies should support the project and donation should be given equivalent to debt amount of project so that project should start other social welfare activities from the beginning in addition to economic benefit of the members.

ADMINISTRATIVE EXPENDITURE

(APPENDIX - I)

S.No.	Head of Account	Expenditure Estimated (Rs. 000)
1.	Salary to staff	856
2.	Insurance	50
3.	Rent, Rates and Taxes	50
4.	Building repairs	50
5.	Overtime to staff	70
6.	Petrol, maintenance of vehicle	100
7.	Conveyance to staff	20
8.	Stationery	20
9.	Entertainment	30
10.	Telephones	75
11.	Postage & Telegrams	25
12.	TA/DA to Staff	50
13.	MISC. Exp.	25
14.	Office electricity	50
15.	Repair & Office renovation	50
16.	Audit fee	24
	TOTAL	1545

SALARIES OF REGULAR EMPLOYEES

(Appendix I-I)

S.No.	Designation	No. of Post	Amount (Rs. 000)	Basis
1.	Project Manager	1	96	8x12x1
2.	Officers	6	252	3.5x6x12
3.	Assistants	8	163	1.7x8x12
4.	Agricultural Assistant	2	41	1.7x2x12
5.	Yield & Quality Assistant	1	24	2x1x12
6.	Steno Grapher	1	30	2.5x1x12
7.	Steno Typist	1	24	2x1x12
8.	Clerk	7	101	1.2X7X12
9.	Driver	2	36	1.5x2x12
10.	Peons	4	48	1x4x12
11.	Chowkidar	2	29	1.2x2x12
12.	Sweeper	1	12	1x1x12
	TOTAL	36	856	

FIXED & VARIABLE WAGES OF SEASONAL LABOUR

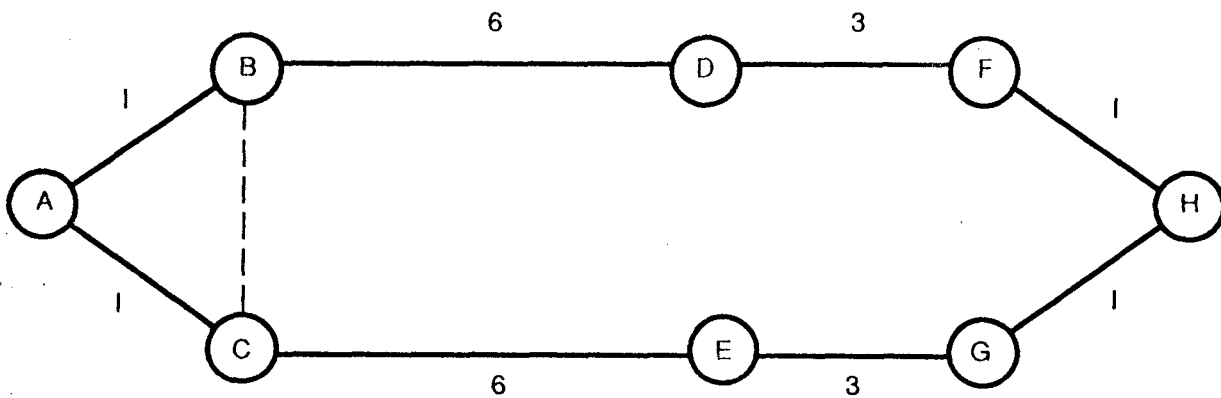
Appendix 2

S.No.	Designation	No. of Post	Amount (Rs. 000)	Basis
<u>GINNING FACTORY</u>				
1.	Sawgin Fitter	2	37.8	2.7x2x7
2.	Assistant Fitter	2	21.00	1.5x2x7
3.	Oil Man	16	95.20	.85x16x7
4.	Saw Man	2	14.00	1x2x7
5.	Press Driver	1	17.5	2.5x1x7
6.	Assistant Driver	1	10.5	1.5x1x7
7.	Oil Man	2	11.9	.85x2x7
8.	Walveman	2	14.0	1x2x7
9.	Cobbler	1	4.9	.70x1x7
10.	Weight Clerk	7	49.0	1x7x7
11.	Electrician	1	17.5	2.5x1x7
12.	Assistant Electrician	1	10.5	1.5x1x7
13.	Overtime		68.95	(25% of 1 to 10)
TOTAL		38	373.00	MONTHLY
<u>OIL MILL</u>				
1.	Expeller Man	1	21.00	3x1x7
2.	Assistant Expeller Man	3	31.50	1.5x3x7
3.	Oil Man	15	89.50	.85x15x7
4.	Refinining Man	1	14.00	2x1x7
5.	Record Clerk	2	14.00	1x2x7
TOTAL		22	170.00	MONTHLY
<u>VARIABLE WAGES</u>				
1.	Ginning daily Wages labour	14	73	40x14x130
2.	Oil Mill daily wages labour	83	431	40x83x130'

CONSTRUCTION SCHEDULE

(APPENDIX - 3)

Steps		Length of Period	Remark
A.	Purchase of Land	1 month	
B.	Layout of Project	1 month	After A
C.	Order for Machinery	1 month	After A with B
D.	Construction of Building	6 month	After A & B
E.	Machinery arrival	6 month	After A,B, C and D
F.	Machinery Instalation	3 month	After d
G.	Electric Fitting	3 month	After D with F
H.	Test Run	1 month	After F & G



TOTAL LENGTH 12 MONTHS

Net Profit For Each Year

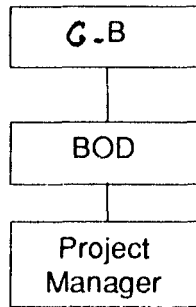
(Rs. 000)

(APPENDIX-4)

YEAR	CAPACITY UTILISATION									
	1	2	3	4	5	6	7	8	9	10
	70%	80%	90%	100%	100%	100%	100%	100%	100%	100%
SALES	Cotton Lint I	140514	160574	180658	200718	200718	200718	200718	200718	200718
	Cotton Lint II	302	346	388	432	432	432	432	432	432
	Refined Oil	15708	17948	20188	22428	22428	22428	22428	22428	22428
	Oil Cake	28599	32682	36767	40852	40852	40852	40852	40852	40852
	Oil Dirt	273	312	350	388	388	388	388	388	388
TOTAL	185396	211862	238351	264818	264818	264818	264818	264818	264818	264818
Variable Cost	177724	203113	228502	253891	253891	253891	253891	253891	253891	253891
Fixed Cost	5419	5167	4916	4665	4414	4003	3752	3500	3249	2798
TOTAL COST	183143	208478	233418	258556	258305	257894	257643	257391	257140	256689
Net Profit	2253	3582	4933	6262	6513	6924	7175	7427	7678	8129
Cumulative Net Profit	2253	5835	10768	17030	23543	30467	37642	45069	52747	60876
Repayment of Loan	1947	1947	1947	1947	1947	1947	1947	1947	1947	1947

5.2 ORGANISATIONAL CHART

(APPENDIX-5)



Procurement Officer	Production Officer	Marketing Officer	Admn. Officer	Account Officer	PLANNING & Ext. Officer
Assist (1) Clerk (1)	Assist (1) Yield & Quality	Assist (1) Clerk (1)	Assist (1) Clerk (2)	Assist (3) Clerk (2)	Supply Assist (1) Technical Assist (2)
Peon (1) Seasonal Labour (7)	Assist (1) Seasonal Skilled Labour (36) Seasonal Unskilled Labour (114)		Steno (1) Stenotypist (1) Driver (2)	Peon (1)	Clerk (1) Assist (1)
			Chowkdar (2) Sweeper (1) Peon (2)		
Total (11)	Total (153)	Total (3)	Total (13)	Total (7)	Total (5)

1. PERMANENT EMPLOYEES	36
2. SEASONAL EMPLOYEES	157
TOTAL	193

DEPARMETNTAL POSITION	
1. PROJECT MANAGER	1
2. PROCUREMENT	11
3. PRODUCTION	153
4. MARKETING	3
5. ADMN.	13
6. ACCOUNTS	7
7. PLANNING & EXTENSION	5
TOTAL	193

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: ILOILO SMALL FARMERS INTEGRATED MARKETING COOP.
<i>COUNTRY</i>	: PHILIPPINES
<i>PROJECT PREPARED BY</i>	: MISS AMELITA P. PROVIDO

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

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A C K N O W L E D G E M E N T
= = = = =

The Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Cooperatives in Asia (October 22, 1990 to May 10, 1991) sponsored by the International Cooperative Alliance (ICA) and funded by the government of Japan held in India, Thailand, Japan and Korea, have given me the best opportunity to understand the concept of integrated cooperative management and techniques.

I am honored to have the said opportunity helped me to understand the various aspects of Agricultural Cooperatives especially in my country and the others in Asia. It also provide me with the knowledge and interest on increasing the farmers income in different ways considering farmers agricultural situation and problems.

For this valuable opportunity, I would like to express my grateful thanks to the following:

1. Project Director M.V. Madane
Project Secretary A.H. Ganeshian
International Cooperative Alliance
Regional Office for Southeast Asia
New Delhi, India

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Indian Institute of Management Ahmedabad, Gujarat, India
4. Mr. Joey Pacificador, National Food Authority, Jaro, Iloilo City
5. Engr. Alexis Belonio, Central Philippine University, Jaro, Iloilo City

My special thanks is also extended to Ms. Melinda B. Aricaya, Mrs. Louenda A. Gulmatico and Mr. Crispulo P. Robles consultant, bookkeeper and chairman respectively of Iloilo Second Area Marketing Cooperative, Inc. for their unselfish support in the preparation of my project study.

Lastly, I extend my heartfelt gratitudes to the Finance Officer of Cooperative Foundation Philippines, Inc. in Manila, Mr. Romilo V. Tasic, who in one way or another made the preparation of my project proposal easier.

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Chapter 1

SUMMARY

1.1 The proposed project is envisioned to establish a strong Cooperative Organization which can compete in the open market both on marketing and processing of its members produced and provide genuine and low cost supply of farm inputs. g

1.2 The proposed project will be undertaken by Iloilo Small Farmers Integrated Marketing Cooperative, covering six (6) Municipalities with Pototan as its center, and its neighboring towns of Barotac Nuevo, Dingle, Dumangas, Mina and Passi.

1.3 The main objective of this proposed project is to increase the income of its farmer-members by providing value addition on farmers produce through access to proper facilities mainly the processing of its product and the utilization of its by-product. It will also provide regular supply of the needed agricultural inputs and warehousing facilities through a no profit and no loss basis.

1.4 The proposed project aims to develop the farmers to become self reliant by encouraging them to participate in the business activities of their Cooperative and providing them with a continuous education program.

1.5 The estimated investment cost for Organization and establishment of Processing Plant both on paddy and its by-product (Rotary Flash Dryer and Charcoal Briquetting) amounted to

Only Four Million Pesos (P 4,000,000.00). Although the project has a component on savings mobilization and continuous capital build-up, it is deemed necessary that the amount stated will be released immediately upon the approval of the project. This is because of the time element involve in the organizing and campaign process. (Refer to Time Plan).

1.6 The project is assumed to have a minimum period of 10 10 years and the implementation process will start immediately upon approval and release of funds.

1.7 This proposed project is envisioned to help the 1,410 110 farmer members and with the plan to increase the membership and expansion to other municipalities are deemed viable in the future.

1.8 The viability of the proposed project is justified in detail in the Financial Analysis as follows:

- a. Payback period is 2.3 years based on the average annual income of 1.73 million pesos
- b. NPV - ₱ 11,741,603
- c. BCR - 2.935
- d. IRR -
- e. BEQ - 105,658 sacks at 50kgs/bag in terms of number of sacks of paddies processed at the milling fee of ₱ 20/bag based on second year of operation.

1.9 Integration of activities such as Backward, Forward and Horizontal Integration will be undertaken by this proposed

project to achieved its main objectives of increasing the farmers income which will eventually lead to the elevation of their present living condition.

CHAPTER 2: BACKGROUND

2. 1. OVERALL SITUATION:

In the Philippines, the development of the country's agriculture is the highest priority of the government today. For the past years, high agricultural production is not attained despite of the favorable climate and soil. Worse, for the past decades, the farmers which are considered as the backbone of the country, find themselves in more aggravating situation. With each passing year there standard of living were degrading to the point below the poverty line.

On the other hand, the province of Iloilo is continuously usly acclaimed the "FOOD BASKET OF THE NATION", for it tops crop production especially in paddy. Mango, Coffee and Cacao place Iloilo among the top ten producers in the country. Its northern coast lines produces bountiful harvest of fish placing again this province as number one producer of seafoods and other marine products.

However, despite of the favorable standing of the province, the majority of the farmers in the area suffer from the same problem with that of the others throughout the country. It is this reality to which this project evolves. The success of this undertaking will have a tremendous effect on the lives of the farmer beneficiaries. It is about time that their pleas should be heard for if the Philippines will have to be economically stable, it must strengthen its economic backbone, the small farmers.

2.2 Area of Project

The target area of the project will cover six municipalities in the province of Iloilo with the town of Pototan as its center. Iloilo province covers 43 municipalities with the total land area of 470,183 hectares (has) classified into commercial forest land, non-commercial forest land, brushland, open land and cogonal. The cultivated agricultural land area covers 329,204 hectares or 70%.

The target population, average family income and expenditures, cropping pattern and average production at the proposed project, is presented below:

2.2.1 Population in the project area:

The population of the six municipalities to be covered by this project are as follows:

	MUNICIPALITIES	NO. OF HOUSEHOLDS	POPULATION		TOTAL
			MALE	FEMALE	
1.	Barotac Nvo.	5,990	17,131	17,145	34,276
2.	Dingle	5,387	14,584	14,595	29,179
3.	Dumangas	7,520	20,564	20,677	41,241
4.	Mina	2,184	6,243	6,047	12,290
5.	Passi	8,409	24,162	23,826	47,988
6.	Pototan	7,964	21,834	22,790	44,624
	T O T A L	37,454	104,517	105,080	209,598

2.2.2. Average Family Income and Expenditure by Family Income Class:
Urban and Rural Area of the Project:

	INCOME CLASS	NO. OF FAMILIES	%	AVERAGE INCOME	AVERAGE EXPEND.
1.	Under P6,000	25,415	3	3,881	4,400
2.	6,000 - 9,999	161,806	18	7,991	8,588
3.	10,000 - 14,999	226,248	26	12,463	12,334
4.	15,000 - 19,999	159,003	18	17,324	16,747
5.	20,000 - 29,000	148,897	17	24,038	22,811
6.	30,000 - 39,999	58,262	6.5	34,249	31,365
7.	40,000 - 49,999	49,613	5.5	48,270	44,700
8.	60,000 - 99,999	29,265	3	79,527	66,948
9.	100 and above	23,044	3	207,484	143,710
	Total	881,553	100	P24,807	P22,310
		=====	=====	=====	=====

The latest census on Income & Expenditure conducted by the (NCSD) National Census and Statistic office in its 1985 survey shows that Iloilo has a total of 233,944 families. Results showed that the total annual income realized was about P58.00 a day at an average of P21,244 per family per year. 26% of the total family income fall below P10,000 per year per family.

2.2.3 Cropping Pattern:

Type of Farm	First Crop	Second Crop	Third Crop
1. Irrigated	Jan-April	May-August	Sept.-Dec.
2. Non-Irrigated	-	June-Sept.	Oct.-Jan.
3. Upland	-	July-Aug.	-

Upland Farmers got the marginal income since they produce

paddy once a year and they have a lesser production compared to irrigated and non-irrigated areas. Their income increases through planting auxiliary crops like mongo, beans, watermelon, rootcrops corn and raising poultry, hog, goat and other animals in their backyard.

Iloilo has an average monthly rainfall of 152.72 cm. with the average temperature for the year registered at 28.68 C and with an average humidity of 76-25 %.

2.2.4. Average Production Per Hectare (Iloilo)

TYPE OF FARM	CROP YEAR - 1989	PRODUCTION (mt)
a. Irrigated		4.33
b. Non-Irrigated		3.55
c. Upland		2.18

The proposed Area Marketing Cooperative, is to be located in the town of Pototan in the central part of Iloilo. For this project, only six municipalities within the area of coverage is to be included. The target beneficiaries comprises 69% or 77 of the registered Samahang Nayon/Farmers' Societies in the area with an average farmer-members of 18 each as shown below:

Municipalities covered	Number of Registered Samahang Nayons	Target SN member
1. Btac. Nuevo	11	5
2. Dingle	22	29
3. Dumangas	29	19
4. Mina	10	8
5. Passi	35	7
6. Pototan	29	19
	----	----
Total	136	77
	=====	=====

2.3 Specific Problems of the Farmers in the Project Area.

There are various problems that beset the target farmer-members in the area which resulted to the continuous decline of their earning potentials. Although production technology does not constitute the main issue, the following are deemed very serious because it virtually drive them into sub-standard living condition.

1. Very low income from farming and other agriculture related activities.
2. Credit facilities for production and inputs requirements needed by the farmers were very costly/expensive due to the limited viable financing assistance from the government and private sectors. Although the government assistance through the Land Bank of the Philippines is available it involves a lot of requirements which sometimes made it inaccessible to the small farmers.

3. Marketing of farm produce. The farmers depend on private businessmen for the marketing of their products. Government support through the National Food Authority is deemed inadequate for their needs. This usually leads to losses on the part of the farmers because the total earnings derived from the sale of their crops is lesser than the total production costs.
4. Farmer organizations do not grow because of limited education and training programs. This was brought by the absence of a clear and serious program from the government and the lack of the initiatives and genuine concern from the private sector.
5. The absence of accessible and cheap facilities for the farmers in the processing and marketing of their produce and its by-products.

2.4 Need and Justification for the Project.

It could be gleaned from the problems mentioned that the farmers are in dire need of both marketing and product utilization assistance. However, it is imperative that in order to answer these problems, there must be a strong cooperative organization to take the lead. Strong organization on the other hand, requires full technical as well as financial support in the process. To generate these, it will take years - even decades on the part of the beneficiaries. In the meantime, the farmers

find themselves in deeper trouble with each passing year. Therefore, outside intervention is necessary to break the vicious cycle of poverty that has trapped them for so long.

The assistance required for the implementation of the proposed project will be basically in the form of low-cost financing. The financing is envisioned to cover the following:

1. Cost of Organizing and pre-membership trainings;
2. Acquisition of Warehouse and Paddy By-Products Processing Plant; and
3. Initial Working Capital Requirement for the first year of operations.

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The organization of a strong cooperative movement will begin with proper value formation among the prospected members. The principles of continues savings and capital build-up as well as contiguous education and training will be deeply emphasized and inculcated on their minds.

Construction of paddy processing and by-products utilization is a must for the members of the Coop to raised their income significantly if sales of their produce and its by-products will be enhanced.

An integrated marketing and procurement system will be developed for the farmers in order that they can fully compete in the open market.

The additional income that the farmers will realized through this project will enable them to save substantially to provide

additional capital for other income generating projects in the future.

Finally, with the various business activities that will be undertaken through this proposed project, it is envisioned that it will generate employment to the unemployed children of the farmer-members.

CHAPTER 3 - THE PROJECT

TITLE OF THE PROJECT: ILOILO SMALL FARMERS INTEGRATED MARKETING COOPERATIVE (INCOME IMPROVEMENT PROJECT)

3.1. PROJECT OBJECTIVES:

The primary objective of this project is to increase the small rice farmers' net income. This is to be achieved by providing an organized framework whereby farmers can work together through the cooperative by integrating the income generating activities into one system.

There are several subsidiary objectives to support the primary objective, to wit:

1. Extend technical assistance to the farmers in order to economize in their cost of production while increasing their production yield through a continuing education and training programs.
2. Provide low cost credit facilities to those farmers who were not served by the government and cooperative sectors (CRB of Iloilo, Land Bank) as well as other banking institutions.
3. Provide a safe and guaranteed marketing place by setting up a product and by-products processing facilities such as, warehousing, handling/drying and processing of produce to help the farmer-members to compete in the open market.
4. Well planned production and marketing scheme through strengthened extension services that will be provided by

the Farm Advisers of the Cooperative in coordination with the Agricultural Extension Workers of the Department of Agriculture.

5. Improve the farmers' agricultural productivity through minimizing farmers risk by providing the farmers the needed crop and life insurance coverage.
6. Develop the habit of savings among members through the Farmers' Savings Fund and through the capital built-up scheme of the Coop.
7. Assist in the personal/individual development of the members to help them participate in the basic economics of business and entrepreneurship of the Coop and to coordinate with other cooperatives and government agencies for the development of efficient and effective service delivery.
8. Provide employment opportunities to the members of the farmers' family, who will be qualified to work in the various business operations of the Coop.
9. Provide access to the services of other existing cooperatives in the area of better market relations, management and technology transfer including capital through the affiliation/union with different federations.

3.2 AREA OF OPERATION:

The project will be located in the town of Pototan, in the province Iloilo. Its main office will be inside the Poblacion of

Pototan, Iloilo. Its proposed processing plant and warehouse is to be along the national highway to Iloilo City located on the zone designed by the government official of the town. It is two (2) kilometers from the main office and it has an average distance of 20 kilometers radius from the other member municipalities.

Pototan, being the center of the area and having all necessary facilities like the National Telecommunications, Iloilo Electric Cooperative Inc. II, National Food Authority coupled by its accessibility is considered as the best location for the project to operate.

3.3 Project Components:

1. Continuous Education & Training - it is a must for the farmer-member to undergo a continuing education and training in order to fully appreciate this project. Thus, the Coop will extend educational and technical assistance to its members through its Board of Directors/ Committees and management staff on areas related to production, cooperative affairs, organizational matters. Technical and special courses/training will be conducted with the assistance of government and non-governmental organizations involved in cooperative.

2. Production loan - will be made available to the farmers to cover the needed farm inputs, which will be distributed by the Coop through a financial assistance from Donating/Financing Agency who is sympathetic to cooperatives and is favorable to this project proposal.

3. Warehousing, Product Processing and Marketing of the Farmers Produce - the Coop will put-up a warehouse with a storing capacity of 40,000 cavans of paddy. Farmers will store their paddy at the warehouse in two to three months without warehousing fee so that they can wait and process their paddy for sale when the prices are profitable to them.

4. By-product Utilization - The disposal of paddy hull could cost the cooperative several thousands of pesos every year. With the advancement in technology, it will be processed to become fuel in the form of briquettes capable of generating heat equivalent to that of charcoal. This charcoal briquettes in turn will be marketed in the area as a cheaper alternative to wood charcoal to generate additional income and correct the problem of pollution. Another utilization of the paddy hull is for fuel in running a mechanical dryer which was made available lately in the locality. This could be utilized in drying the paddy during wet season. With the availability of a mechanical dryer, the farmers could maintain the good quality of their paddy when processed and demand better price.

5. Farmers Savings Fund - most farmers do not realize the value of savings. Through the Farmers Savings Fund they will be taught to set aside a portion of their produce to serve as a source of capital for other income generating projects or retirement fund in the event they stop farming.

CHAPTER 4

DETAILS OF OPERATION

The proposed project will be undertaken by a newly organized cooperative. The following are the details of its operations:

4.1 Education and Training of the members.

The success or failure of this project to a great extent will depend upon the full understanding and cooperation of the members. Thus, proper orientation about the cooperative concepts and the proposed project will be conducted. This will be sustained by continuing education and training to be assisted by the Western Visayas Union of Cooperative, Inc. (WVUCI). Technical authorities of noted experiences will be invited/hired as resource person in conducting the seminar or training.

The schedules of seminar/training activities to be conducted at the cooperative and SN levels are listed in Table 7

Monthly meetings of the farmer-members at the SN level shall be encouraged and will be attended by the Farm Advisers coming from government agencies who will introduce farm management guidance and promote better living activities. In the meeting, members will be taught the mechanics of marketing and encouraged to participate actively in the business affairs of their coop.

4.2 Production Loan.

The Production loan assistance to the farmers will be

divided into two categories namely: a) the cooperative acting as conduit organization and guarantor for those members eligible for financial assistance from the Land Bank of the Philippines, Cooperative Rural Bank and other formal lending institutions; and b) as direct creditor for those beneficiaries who cannot qualify under the first category because of past due loans and non-compliance of requirements.

4.2.1 As Conduit Organization.

The cooperative shall facilitate the processing and release of loans as well as guarantee its payments upon maturity for the members who were served by the CRB of Iloilo, Land Bank and other banking institutions. To guarantee the loan payments, the cooperative will temporarily pay the bank for the member's loan while he is waiting for the sale of his produce at a good price. During the past decades it had been noticed that the major cause of the farmer's failure to pay back his loan is due to the losses he incurred in farming due to the unstable prices in marketing his produced. This scheme is expected to eliminate this cause and help build up the credibility of small farmers in the banking sector. (Refer to 4.3 for the details of the scheme).

4.2.2 Direct Creditor.

Under this project component, a farmer-member shall be granted a production loan of not more than P5,500 per hectare for his farm inputs. The vital strategy is that the loan will be released in kind, that is, farm inputs, instead of the usual cash

transactions including in (a). This ensure the cooperative that the amount loaned out will really go to the production process.

At harvest time, the farmer will deliver to the Coop the paddy sufficient for the payment of his production loan plus the interest. However, he will also be required to sell his marketable surplus through the Coop.

The Coop will also require the farmers to cover their crops with insurance through the (PCIC) Philippine Crop Insurance Corporation, so that in case of failure in repayment caused by calamities, the crop insurance will assume for the payment of the entire loan including those granted under (a). The farmer will be covered also with life insurance under the Cooperative Insurance System of the Philippines, Inc. as part of its social benefits to the members. Premiums for the aforementioned insurance will be paid by the cooperative out of its earnings.

4.3 Marketing of Farm In-puts and Paddy Procurement.

4.3.1 Marketing of Farm In-puts.

One of the major assistance to compliment production loan is the procurement of the necessary farm inputs to the farmers. It is only through this process that the quality and the fairness of the cost of fertilizers and chemicals used in production will be assured. Through this process alone, a substantial amount of savings could be gained by the farmer beneficiaries because additional mark ups by the distributors and retailers will be automatically eliminated.

The procurement scheme requires constant planning and cooperation among farmer members because the purchases will be done in bulk directly from the manufacturers and importers. The availment of volume discounts and rebates for the purchases could be realized only if the cooperative will meet the specified quotas set by the importers and manufacturers. Thus, to do this, the procurement process must be done in the correct schedule and that the required farm in-put requirements be properly identified.

What is unique in this procurement strategy is that the cooperative will not be required to provide the necessary working capital for the purchase of said farm in-puts. Instead, since the procurement will be done on a definite schedule set by the beneficiaries themselves, they will be the one who will purchase the goods through pooling of their individual purchase requirements which will come from the proceeds of their production loans. What the cooperative will provide is the necessary logistic needs and management as the one representing the whole transaction between the farmers and the manufacturers.

Table 5 shows the potential savings that the farmer beneficiary will derive through this project component alone.

4.3.2 Paddy Procurement/Marketing.

Recent studies conducted by the Cooperative Foundation Philippines, Inc., an NGO engaged in cooperative development throughout the country, showed that the major cause for the

Farmer's ongoing problem is not rooted to the high cost of production but to their inability to do business once the produce is ready for marketing. In the area covered by the project, the planting and harvest season follows a definite schedule. For a farmer to be able to avoid the risk of infestation, calamities and other force majeure, it is necessary for him to abide with the season. However, the absence of a strongly organized marketing arm and facilities made them vulnerable to the setback of prices caused by the Law of Supply and Demand. It is at this time when the supply is flooding the market that unscrupulous businessmen took advantage of the situation.

The same studies further conclude that for the farmers to maximize their earning potentials, they must be able to sell their products not as raw materials but as processed goods ready for consumption. This necessitates the availability of processing plants accessible to them amidst the competition in the business.

Through the cooperative, it is envisioned that this problem will be gradually corrected until such time that it will be totally eliminated by providing the following assistance:

4.3.2.1. Warehousing.

During harvest time, when supply is up and prices is down, the cooperative will offer warehousing facilities among its members for free. Thus, while waiting for the supply to go down and prices to go up, the member is provided with the storage facility for his product until such time that it will be ready for processing so it could be disposed at the right price.

On the other hand, in order to ensure the availability of his needed financing for the next production and providential cycle, the cooperative will pay his previous loans including interest to whatever institution it owed. After which, the member could again apply for financing from his previous creditor. The cooperative will not charged any interest out of its service as a loan guarantor. This guarantees that no member will incur past due loans.

4.3.3.2. Marketing

One of the major assistance that the cooperative will provide among its members will be the constant monitoring of prices and the establishment of networks among consumers and other cooperatives. Members will be constantly provided with the current market condition and necessary advice as to when to dispose their products. Furthermore, the cooperative will assist them in finding the most profitable buyer for a minimum commission charge of ₱ 1.00 per bag. The amount of commission is justifiable due to the fact that all transactions through private traders involved the same charges of at least ₱ 2.00 per bag.

4.4 Paddy Processing

The coop Paddy Processing Plant will have a total capacity of 2.5 MT per hour, operating for two shifts of 10 hours each per day, for 20 working days in one month and is expected to operate 12 months a year. The annual capacity is 9,600 MT, which is equivalent to 60% of the total marketable surplus of the members' produce. Plant utilization rate is expected to be at 30% only during the first year.

Processing of farmers paddy will be ensured to be in the best quality to be competitive in the market. During slack periods, where the plant is not milling the members' paddy, the Coop will accept the paddy of private traders or that of the National Food Authority for milling to earn other income.

The percentage of milling recovery will be at the range of 68% to 70% in rice and 7 to 8 % on rice bran. Rice hull, its by-product, will have the maximum of 22% to 25%.

4.6 By-Products Utilization

4.6.1 Charcoal Briquettes from Paddy Hull Utilization

Charcoal briquettes will be manufactured from rice hull which is a waste material and unwanted by Ricemill owners in his ricemill site. Utilizing rice hull as a fuel will help the consumer save from a high cost of fuel.

Manufacturing charcoal briquettes from a paddy hull is a must because of the energy crisis that the world is now suffering and cutting of woods is now prohibited by the government. Shortages of gas and wood charcoal is often experienced and that its price continuously rises.

Charcoal briquettes on the other hand was observed to have a higher heating value than wood or plain charcoal. It is smokeless when burned and it gives off an intense and steady heat. It burns out longer than charcoal and is easy to handle for transport or storage because they have more weight per unit volume. It can also replace coal in the smelting of iron ore.

Charcoal briquetting involves four major steps, namely:

a) carbonization, b) mixing with binder c) briquetting d) drying.

4.6.2 Setting up a Rotary Flash Dryer - The mechanical dryer will use paddy hull as main source of energy to generate heat in drying the paddy.

This dryer is envisioned by the Coop to help its farmer members maintained the good quality of paddy he harvested and this will help him store it in a longer time. This will be actively utilized during wet season when the regions has less sunlight and more rain while paddy is on harvest season.

4.7 Farmers Savings Fund

Farmers will also be encouraged to build up a savings that can be used as collateral for production loan. It is an important aspect of the project. As the farmers build-up his savings fund, additional funds will be accumulated & can replace the funds allocated for his production loan.

The premise for the feature of this project is that farmers will readily set aside a portion of his production as his savings if there is an immediate, recognizable as well as longer term benefits for him:

The implementing strategies are as follows:

1. Farmer-member will be encouraged to deposit one (1) cavan of paddy per harvest per hectare to the Coop, who will hold it in trust, as his savings fund
2. The farmer-member can withdraw his Savings fund only

when he stops farming or ceases to be a member of the cooperative.

3. In instances when farmer member fails to pay his production loan, not caused by calamities insured through the Philippine Crop Insurance, his Savings Fund will be used to make the payment and he will be automatically non-eligible for any program benefit from the cooperatives.
4. The accumulated substantial amount on Farmers Savings Fund will help them participate in other income generating projects of the cooperative.
5. The accumulated Savings Fund of the farmer-members will be also utilized for the establishment of a mutual aid fund such as death benefit or their retirement fund.

CHAPTER 5

ORGANIZATION AND MANAGEMENT

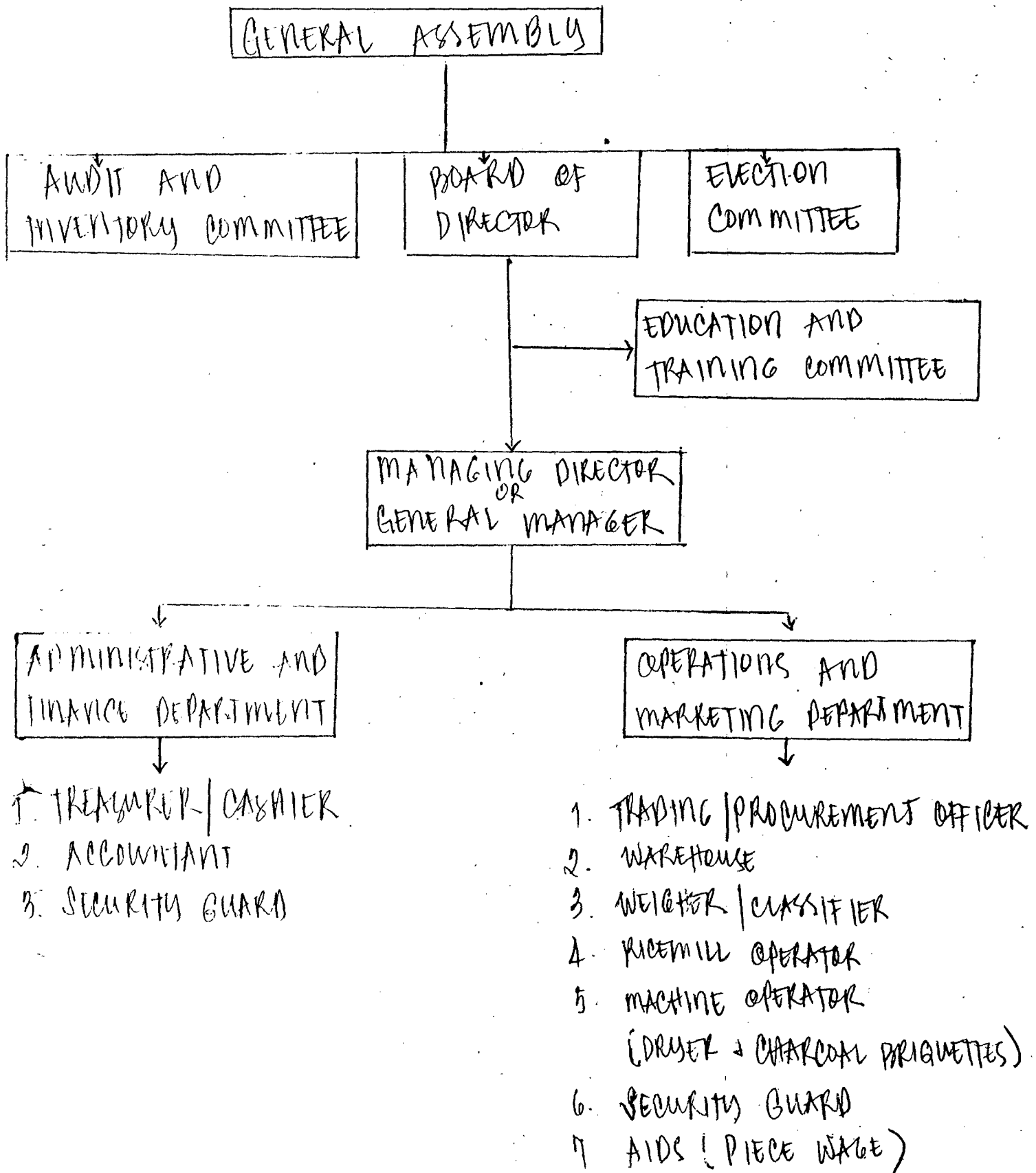
The cooperative will adapt the following management functions and organizational structure:

1. General Assembly of Members - It will be composed of the target 1,410 individual farmers in good standing duly convened in a regular or special meeting and acting as a body. It has the ultimate authority in the administration and management of the affairs of the Coop.
2. Board of Directors - comprised of five (5) members who are to be elected by the General Assembly during its annual meetings. The Board of Directors elect from among themselves the Chairman, Vice-chairman and Secretary. The Treasurer/Cashier will be appointed by the Board of Directors from the management staff, who will served on full time basis and has a real estate bond as security depending on the case.
3. Management Staff - is charged with the day to day affairs of the Coop and is headed by the Managing Director, usually the Chairman, who implements the policies adopted by the Board of Directors and the general assembly during the annual meeting. The Management Staff are responsible to the Board of Directors for the satisfactory performance of their

assigned functions.

4. Audit & Inventory Committee - is a constitutional body composed of 5 members to be elected by the general assembly. It is considered as the watchdog of the Coop for and it is tasked to conduct internal audit and physical inventory of the assets & properties of the Coop.
5. Election Committee - is a constitutional body composed of 3 members elected by the general assembly. It supervise the conduct of all elections at the cooperative.
6. Education & Training Committee - the elected Vice-Chairman of the Board of Directors becomes automatically the Chairman of this committee with two (2) members appointed by the Board. It is tasked to handle all trainings and seminars conducted by the cooperative to ensure its continuous education and training program.

PROPOSED
ORGANIZATION AND MANAGEMENT STRUCTURE



CHAPTER VI

FINANCIAL ANALYSIS

TO PROVE THAT THIS PROJECT IS VIABLE THE FOLLOWING PROJECTED FINANCIAL ANALYSIS IS HEREBY PRESENTED.

6:1 COST OF THE PROPOSED PROJECT
(SEE ANNEX #

6:2 SOURCES OF FUNDS:

THE TOTAL COST OF THE PROPOSED PROJECT IS THROUGH MEMBERS CONTRIBUTION AND LENDING INSTITUTION AT AN INTEREST RATE OF 12% AT THE BEGINNING OF THE YEAR. THE DISCOUNT RATE IN CALCULATING THE INVESTMENT WORTH IS 12%.

6:3 THE INVESTMENT WORTH OF THIS PROPOSED PROJECT AT THE END OF 10 YEARS IS FOUND IN TABLE

6:4 RESULTS OF THE FINANCIAL ANALYSIS

NPV = ₱ 7,260,578.00

BCR = 2.8

IRR = 32.3%

DISCOUNTED PAYBACK PERIOD = 5 YEARS

ILOILO SMALL FARMERS INTEGRATED MARKETING COOPERATIVE
PROJECTED FINANCIAL POSITIONS
FOR THE YEARS 1 TO YEAR 10

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
A S S E T S										
Cash	81,575	1,098,982	1,537,132	2,145,730	2,852,859	3,336,980	4,283,554	5,357,301	6,569,737	7,931,533
Property, Plant and Equipment										
Land	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Warehouse/Building (net of dep'n)	1,151,953	1,043,392	934,831	826,270	717,709	609,148	500,587	392,026	283,465	174,904
Paddy Processing Plant										
& Equipments (net of dep'n)	1,623,500	1,470,500	1,317,500	1,164,500	1,011,500	858,500	705,500	552,500	399,500	246,500
Charcoal Briquetting Machine (net)**	91,000	73,000	55,000	37,000	19,000	142,000	149,175	122,175	95,175	68,175
Rotary Flash Dryer (net)**	118,755	95,265	71,775	48,285	24,795	185,292	150,057	114,822	79,587	44,352
TOTAL ASSETS	3,366,783	4,081,139	4,216,238	4,521,785	4,925,863	5,431,920	6,088,873	6,838,824	7,727,464	8,765,464
LIABILITIES & EQUITY										
Members' Savings Deposits (Exhibit)	105,750	317,250	528,750	761,400	1,017,315	1,298,821	1,608,478	1,949,101	2,323,786	2,735,940
Loans Payable	3,600,000	3,200,000	2,800,000	2,400,000	2,000,000	1,600,000	1,200,000	800,000	400,000	0
Total Liabilities	3,705,750	3,517,250	3,328,750	3,161,400	3,017,315	2,898,821	2,808,478	2,749,101	2,723,786	2,735,940
Members' Capital Contribution*	52,875	158,625	264,375	380,700	508,658	649,411	804,239	974,551	1,161,893	1,367,970
Undivided Profits/Surplus	(391,842)	405,264	623,113	979,685	1,399,890	1,883,688	2,476,156	3,115,172	3,841,785	4,661,554
	(338,967)	563,889	887,488	1,360,385	1,908,548	2,533,099	3,280,395	4,089,723	5,003,678	6,029,524
TOTAL LIABILITIES & MEMBERS' EQUITY	3,366,783	4,081,139	4,216,238	4,521,785	4,925,863	5,431,920	6,088,873	6,838,824	7,727,464	8,765,464

* - The Capital Build-up Scheme is presumed to be the same with that of the Savings Plan but only half of the amount.

** - The Dryer & Briquetting Machine is replaced on the sixth year at 150% of the current price.

LITTLE SMALL FARMERS' INTEGRATED MARKETING COOPERATIVE
 PROJECTED RESULTS OF OPERATIONS
 FOR THE PERIODS ENDING YEAR 1 TO YEAR 10

I N C O M E	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Receipts from Milling of Paddies of Members (Utilization Rate Year 1 - 30%, Year 2 & 3 - 80% others - 100%) Sch. 2	1,018,246	2,715,322	2,986,854	3,733,567	4,106,924	4,517,616	4,969,378	5,466,316	6,012,947	6,614,282
Receipts from Milling of Paddies from Non-members (MFA & Private Traders) Estimated @ 10% of Members	101,825	271,532	298,685	373,357	410,692	451,762	496,938	546,632	601,295	661,424
Receipts from Drying Operations (Utilization Rate - Year 1-0%, others 100% at 6 months only) Sch. 8		112,500	123,750	136,125	149,738	164,711	181,182	199,301	219,231	241,154
Sale from Charcoal Briquettes (P1/kg) Sch. 9	15,000	16,500	18,150	19,965	21,962	24,158	26,573	29,231	32,154	35,369
Rebates from Farm-Chemicals (Sch. 4)	121,160	242,520	266,772	293,449	322,794	355,074	390,581	429,639	472,603	519,863
Commission Income from Fertilizers Sch. 5	14,100	28,200	31,020	34,122	37,534	41,288	45,416	49,958	54,954	60,449
Commission from Sale of Processed Paddies (Sch. 10)	50,912	135,766	135,766	186,678	205,345	225,880	248,468	273,315	300,646	330,711
GROSS INCOME FROM OPERATIONS	1,321,243	3,522,340	3,860,997	4,777,263	5,254,989	5,780,488	6,358,537	6,994,391	7,693,829	8,465,212
LESS: ADMINISTRATIVE & OPERATING EXPENSES										
Organizing and Training Costs (Applicable only for year 1) Table 7	401,900	201,000	221,100	243,210	267,531	294,284	323,713	356,084	391,692	430,881
Administrative Costs (Sch. 3)	263,705	580,151	638,166	701,983	772,181	849,399	934,339	1,027,773	1,130,550	1,243,605
Paddy Processing (Table 4)	407,105	1,065,614	1,194,175	1,492,718	1,641,990	1,806,189	1,986,808	2,185,488	2,404,037	2,644,441
Drying Operation (Schedule 9)		84,621	93,083	102,391	112,631	123,894	136,283	149,911	164,902	181,393
Briquettes Processing Costs (Schedule 10)	8,850	9,735	10,709	11,779	12,957	14,253	15,678	17,246	18,971	20,868
Depreciation Expenses (Schedule 6)	151,526	303,051	303,051	303,051	303,051	323,796	323,796	323,796	323,796	323,796
Repairs and Maintenance (estimated at 1% of equipment costs at Year 2 and 5% thereafter exc by-products) Interests on Loans (4 M at 12% p.a.)	480,000	29,062	145,312	159,943	175,828	193,410	212,751	234,026	257,429	283,172
		432,000	384,000	336,000	288,000	240,000	192,000	144,000	96,000	48,000
Total Admin. & Operating Expenses	1,713,086	2,755,234	2,989,596	3,350,976	3,574,168	3,845,225	4,125,368	4,438,325	4,787,378	5,176,136
NET INCOME/(LOSS) FROM OPERATION	(391,843)	767,106	871,402	1,426,287	1,680,821	1,935,263	2,233,169	2,556,066	2,906,451	3,287,076

CHAPTER 7

The following is the projects time table of activities and cash flow statement for the ten year period:

A C T I V I T Y	MONTH
1. Submit the project proposal to funding agency for approval.	0
2. Receive approval of the project from funding agency.	1
3. Campaign for the organization of a new cooperative in six municipalities	1
4. Conduct membership seminar and orientation for the individual-farmers, who will directly be the members of this new coop.	2
5. Campaign for the payment of initial share capital among farmer-members, who have signified to join the coop.	2-6
6. Scout for location of warehouse and rice-mill and verify pertinent documents.	3
7. Canvass prices of machineries and construction materials.	3-4
8. Conduct bidding for the construction of the warehouse.	3
9. Purchase of land and preparation of necessary documents.	3
10. Warehouse construction.	3
11. Registration of the cooperative	5
12. Finalize contract for the purchase of ricemill.	5
13. Conduct education/training.	3-23
14. Purchase warehouse/ricemill equipments.	5
15. Installation of the ricemill and electricity.	5
16. Conduct an annual general assembly	5

meeting to update members on the project.

17. Test run of the ricemill. 6
18. Negotiate with suppliers of farm inputs
for bulk purchasing by the Coop. 6
19. Start operation 6

PROPOSED TIME PLAN ACTIVITY

PARTICULARS / ACTIVITY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2 + 3																									
4																									
5																									
6																									
7																									
8, 9 + 10																									
11 + 12																									
13																									
14, 15 + 16																									
17, 18 + 19																									

TOTAL LENGTH : 6 MONTHS

ILOILO SMALL FARMERS INTEGRATED MARKETING COOPERATIVE
PROJECTED CASH FLOW STATEMENTS
FOR THE YEARS 1 TO YEAR 10

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
CASH BALANCE, BEGINNING OF THE YEAR		81,575	1,098,982	1,537,132	2,145,730	2,852,859	3,336,980	4,283,554	5,357,301	6,569,737
ADD: CASH RECEIPTS										
Gross Income from all Sources (Refer to Income Statement)	1,321,243	3,522,340	3,860,997	4,777,263	5,254,989	5,780,488	6,358,537	6,994,391	7,693,829	8,463,212
Proceeds from Loans	4,000,000									
Members Capital Contribution	52,875	105,750	105,750	116,325	127,958	140,753	154,829	170,312	187,343	206,077
Members Savings Fund	105,750	211,500	211,500	232,650	255,915	281,506	309,657	340,623	374,685	412,154
TOTAL CASH RECEIPTS	5,479,868	3,839,590	4,178,247	5,126,238	5,638,862	6,202,747	6,823,023	7,505,326	8,255,857	9,081,443
TOTAL CASH AVAILABLE	5,479,868	3,921,165	5,277,229	6,663,370	7,784,592	9,055,606	10,160,002	11,788,880	13,613,157	15,651,180
LESS: CASH DISBURSEMENTS										
Total Administrative and Operating Expenses (Refer to Income Statement)	1,561,560	2,422,183	2,606,545	3,047,925	3,271,117	3,521,429	3,801,572	4,114,529	4,463,582	4,852,340
Acquisition of Land	300,000									
Construction of Building	1,206,233									
Purchase of Paddy Processing Plant and Equipments	1,700,000									
Purchase of Rotary Flash Dryer	130,500									
Purchase of Charcoal Briquetting Machine	100,000									
Loan Amortization	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000
Patronage Refunds and Dividends*			653,552	1,069,715	1,260,616	1,451,447	1,674,876	1,917,050	2,179,838	2,467,307
TOTAL CASH DISBURSEMENTS	5,398,293	2,822,183	3,740,097	4,517,640	4,931,733	5,718,626	6,876,448	8,431,579	10,043,420	12,719,647
CASH BALANCE, END OF THE YEAR	81,575	1,098,982	1,537,132	2,145,730	2,852,859	3,736,980	4,283,554	5,357,301	6,569,737	7,931,533

* - Dividends is assumed at 75% of Annual Net Income.
The remaining 25% will form part of the Reserves for future expansion.

★ INVESTMENT WORTH OF THE PROJECT (₹ 000)

PARTICULARS	0	1	2	3	4	5	6	7	8	9	10
A. CASH INFLOW											
1. RECURRING CASH INFLOW	-	1,321	3,522	3,861	4,777	5,245	5,780	6,359	6,994	7,694	8,461
2. SALVAGE VALUE	-	-	-	-	-	29,050	-	-	-	-	325
3. TOTAL CASH INFLOW (1+2)		1,321	3,522	3,861	4,777	5,272	5,780	6,359	6,994	7,694	8,788
B. CASH OUTFLOW											
4. RECURRING CASH OUTFLOW BEFORE DEP. & INTEREST		1,082	1,990	2,303	2,712	2,983	3,281	3,609	3,971	4,368	4,804
5. CAPITAL EXPENDITURE	3,964						346				
6. TOTAL CASH OUTFLOW (4+5)	3,964	1,082	1,990	2,303	2,712	2,983	3,627	3,609	3,971	4,368	4,804
7. NET CASH INFLOW (3-6)		240	1,532	1,558	2,065	2,295	2,153	2,750	3,023	3,326	3,984
8. DISCOUNT FACTOR (i=12%)		0.89286	0.79719	0.71178	0.63551	0.56740	0.50663	0.45245	0.40388	0.36061	0.3219
9. PRESENT VALUE 7X8		214	1,221	1,109	1,312	1,302	1,091	1,244	1,221	1,199	1,283

DISCOUNTED PAYBACK PERIOD = 5 YEARS

NPV = ₹ 7,260,578

BCR = Benefit/Cost = $\frac{11,127,911}{3,976,783}$

= 2.8

IRR = $30\% + (30-12)\% \times \frac{1,062,298}{7,260,598 + 1,062,298}$

= 32.3%

NPV (30%) = 1,062,298

CHAPTER 8

RECOMMENDATIONS

The present net income of the small paddy farmers clearly define that it is not sufficient to help them live a decent life. Its high cost of production and very low selling price tied-up the life of the farmers to the private lenders. With this situation, his production will never be enough to pay off his loan to them and without giving assistance to the farmers in marketing and product and by-product processing they could never be free from bondage.

There is a need to integrate the activities of the farmers to increase its net income such as technical assistance, production loan at a minimal interest rate and processing its product as well as utilizing the by-product through collective efforts. Through this integration, the cooperative will be developed to a self reliant farmers organization.

This proposed project will provide a processing facility which will process the product of the farmers in order for them to increase their net income by as much as 40% of his produce if sold at farm gate. (See Schedule for reference). Furthermore, income will increase by utilizing the by-products such as rice hull as a source of energy in drying paddies during rainy season (rotary Flash Dryer) and as source of fuel instead of the conventional wood charcoal (Charcoal Briquetting).

The increase of farmers net income will help the farmers improve their standard of living and eventually could send their

children to school for higher education. The proposed project will also generate employment opportunities to the unemployed members of the community who are willing to join the cooperative.

It is envisioned that after the fifth year of its operations, plans for expansion will be undertaken to extend the services of the cooperative such as selling fertilizers to non members and even the purchase of process product from its members at reasonable prices higher than that offered by the government.

T A B L E 1

T O T A L P R O J E C T C O S T S

Land Acquisition (1 hectare)	F	300,000
Warehouse & Processing Plant Building		1,206,233
Ricemill Machinery and Equipment		1,700,000
By-Product Utilization Equipment		
Charcoal Briquetting Machine		100,000
Rotary Flash Dryer		130,500
Working Capital for Year 1 (Organizing Stage)		500,000
T O T A L		F 3,936,733

T A B L E 2

Average Farmers' Estimated Marketable Surplus Analysis
for Two Crops/Production Cycle

Paddy Production (annually/ave landholdings @ 148cavans)		296 cavans
Less Deductions:		
Home Consumptions (4 cavans /month)	48 cavans	
Irrigation Fee (fixed @ 3 cavans/ha/year)	5 cavans	
Treshing Fee (14% of total production)	42 cavans	95 cavans
Paddy Available for Processing and Sale		201 cavans
Less: Estimated Shrinkage @ 12% (drying)		24 cavans
AVERAGE NET PADDY PRODUCTION AVAILABLE		177 cavans

T A B L E 3

Computation of Annual Plant Capacity in Volume
at Full Capacity

Plant Capacity per hour (2.5 T)		50 cavans
Number of Hours Operating per Day		20 hours
Estimated Average Daily Output		1,000 cavans
Number of Days Operating per Month		20 days
Estimated Average Monthly Output		20,000 cavans
Number of Months Operating in a Year		12 months
Estimated Annual Output		240,000 cavans
Recovery Rate		68%
ESTIMATED AVERAGE CAPACITY OF PROCESSED PADDY		352,941 cavans

T A B L E 4

Costs of Paddy Processing per Bag at Full Capacity

Power Costs of Machinery and Equipment (85 HP machine @ .746 kw/hr) (85hp x .746kw x 20hrs x 240 days)		304,368 kw
Other Electric Installations assumed at 30 kw per day (30kw x 240days)		7,200 kw
Total Kilowatt Consumptions		311,568 kw
Actual Kilowatt Rate	P	3.20
Total Costs on Electricity		P 997,018
Add: Ricemill Operator Salary (peice wage) (P.50/bag x 240,000bags)		120,000
Handling and Other Costs (P1.00/bag x 240,000bags)		240,000
TOTAL COSTS AT FULL CAPACITY		P 1,357,018
Annual Capacity in Volume (Table 3)		240,000 cavans
Estimated Processing Costs per bag	P	5.65 /cavan

T A B L E 5

Potential Savings of Farmer-Member from the Project's Procurement Scheme

Suppliers	Average Offered Price (Volume Disc.)	Commission Charges	Average Sales Price (Project)	Average Local Dealers Selling Price	Average Potential Savings
A. FERTILIZERS					
1. FERTIPHIL CORP. price/bag in pesos	295.00	1.00	296.00	355.00	59.00
2. PHILPHOS CORP. price/bag in pesos	290.00	1.00	291.00	350.00	59.00
3. PLANTERS' PRODUCT price/bag in pesos	300.00	1.00	301.00	360.00	59.00
B. CHEMICALS					
1. SHELL CHEMICALS price/liter in pesos	81.90	81.90	130.00	48.10	
2. BAYER PHILS. INC. price/liter in pesos	86.18	86.18	126.00	39.82	
3. CIBA GEIGY PHILS. price/liter in pesos	95.76	95.76	126.00	30.24	
4. HOERSCT CHEMICALS					

T A B L E 5

continued...

price/liter in pesos	149.63	149.63	230.00	80.37
5. PLANTERS' PRODUCT				
price/liter in pesos	94.48	94.48	130.00	35.52
6. JARDINE DAVIS				
price/liter in pesos	73.44	73.44	130.00	56.56

SCHEDULE 6

Computation of Annual Depreciation Expense

STRAIGHT LINE METHOD

Warehouse and Processing Plant Building				
Acquisition Costs			1,206,233	
Less: Salvage Value (10%)			120,623	
			<hr/>	
Costs Subject to Depreciation			1,085,610	
Estimated Useful Life		10 years		108,561
			<hr/>	
Ricemill/Paddy Processing Plant				
Acquisition Costs			1,700,000	
Less: Salvage Value (10%)			170,000	
			<hr/>	
Costs Subject to Depreciation			1,530,000	
Estimated Useful Life		10 years		153,000
			<hr/>	
Charcoal Briquetting Machine				
Acquisition Costs			100,000	
Less: Salvage Value (10%)			10,000	
			<hr/>	
Costs Subject to Depreciation			90,000	
Estimated Useful Life		5 years		18,000
			<hr/>	
Rotary Flash Dryer				
Acquisition Costs			130,500	
Less: Salvage Value (10%)			13,050	
			<hr/>	
Costs Subject to Depreciation			117,450	
Estimated Useful Life		5 years		23,490
			<hr/>	
TOTAL ANNUAL DEPRECIATION EXPENSE				303,051
				=====

TABLE 7

Education and Training Activities Schedule and Budget

Description	No. of days	No. of Participants	Training Costs
A. Training at SN Level			
1.Orientation on Project	2	90	9,000.00
2.Coop Concept & Values	2	90	9,000.00
3.Farmer Mgt. Training *	1	90	4,500.00
4.Pre/Post Harvest Technical and Mktg. Seminar*	3	90	13,500.00
5.Bus. Entrepreneurship Training*	3	90	13,500.00
6.Better Living Seminar*	2	90	9,000.00
	13	540	58,500.00
B. Training at Coop Level			
1.Orientation on Project	2	20	2,400.00
2.Trainers Training	5	30	37,500.00
3.Recording/Bookkeeping*	2	30	21,000.00
4.Reporting/Monitoring and Evaluation*	2	20	12,000.00
5.Management Training*	3	90	67,500.00
6.Leadership Training*	2	90	45,000.00
7.Farm Management * Guidance	2	30	15,000.00
	18	310	200,400.00
T O T A L	31	850	258,900.00
C. Personnel Involved			
	Monthly Rate	One Year Salary	
1.Training Officer	4,000.00	52,000.00	
2.Organizer/Trainer #1	3,500.00	45,500.00	
3.Organizer Trainer #2	3,500.00	45,500.00	143,000.00
TOTAL ORGANIZING AND TRAINING COSTS			401,900.00

NOTE:

The bulk of the training and organizing costs is considered heavy during the first year because it is the stage wherein the project will begin organizing its beneficiaries. On the following year, the activity will be shifted to the Education and Training Committee and all the staff hired during the first year will no longer be needed. Training activities with an asterisk (*) are considered continuous all throughout the life of the project.

SCHEDULE 1

**TOTAL AVERAGE PADDY AVAILABLE FOR PROCESSING
ANNUALLY**

Net Paddy Available for Processing (Refer to Table 2)	177 cavans*
Total Number of Farmer Members	1,410 members
<hr/>	
Average Annual Paddy Available for Processing	249,570 cavans
<hr/>	

* - one cavan is equivalent to 50 kgs.

SCHEDULE 2

**Annual Estimated Milling/Processing Fee at Full Capacity
for Two Crops/Production Cycle**

Average Paddy Available for Processing (Schedule 1)	249,570
Estimated Recovery Rate	68%
<hr/>	
Average Annual Output	169,707
Current Milling/Processing Fee per cavan	P 20
<hr/>	
Estimated Annual Gross Income at Full Capacity	P 3,394,140
<hr/>	

SCHEDULE 3

Annual Administrative Expenses

A. Salaries and Wages

Personnel	Monthly Rate	Annual Rate	Total
<hr/>			
General Manager/ Managing Director	8,000	104,000	
Treasurer/Cashier	5,000	65,000	
Accountant	4,500	58,500	
Trading/ Procurement Off.	4,000	52,000	
Warehouseman	3,700	48,100	
Weigher/Classifier	3,500	45,500	
Security Guard #1	3,000	39,000	
Security Guard #2	3,000	39,000	451,100
B. SSS and Medicare Benefits @ 10%			45,110
C. Light and Water			1,200
D. Office Supplies			5,000

SCHEDULE 3

continued...

E. Taxes and Licenses	5,000
F. Representations and Travels	5,000
G. Miscellaneous Expenses	5,000
H. Insurance and Other Benefits	10,000
TOTAL ADMINISTRATIVE COSTS	527,410

SCHEDULE 4

Computation of Rebates from Farm Chemical Requirements

Chemical Requirement/Member/Crop	P	1,720
Number of Members		1,410
Total Cost of Chemical Requirements per Crop	P	2,425,200
Number of Croppings Annually		2
Total Cost of Chemical Requirements Annually	P	4,850,400
Minimum Rate of Rebates Offered By Suppliers		5%
Estimated Earnings from Rebates		242,520

SCHEDULE 5

Computation of Commission Income from Fertilizers
Procurement Transactions

Average Member Requirement per Crop	10 bags
Number of Members	1,410
Total Number of Bags Required per Crop	14,100 bags
Number of Croppings per Year	2
Total Annual Fertilizer Requirement in Bags	28,200 bags
Commission Income per Bag	P 1.00
Estimated Annual Commission Income	P 28,200

SCHEDULE 7

Computation of Annual Interest Expense on Loans

Year	Principal	Interest Rate	Interest Expense
1	4,000,000.00	12%	480,000.00
2	3,600,000.00	12%	432,000.00
3	3,200,000.00	12%	384,000.00
4	2,800,000.00	12%	336,000.00
5	2,400,000.00	12%	288,000.00
6	2,000,000.00	12%	240,000.00
7	1,600,000.00	12%	192,000.00
8	1,200,000.00	12%	144,000.00
9	800,000.00	12%	96,000.00
10	400,000.00	12%	48,000.00

SCHEDULE 8

Computation of Annual Receipts
from Drying Fees

Estimated Capacity of Dryer in Bags At an Eight Hour a Day Operation	125 bags
Estimated Number of Days Operating in a month	30 days

Average Monthly Output	3,750 bags
Estimated Number of Months Operating in a Year	6 months

Estimated Average Annual Output at Full Capacity	22,500 bags
Drying Fee Charged by the Cooperative	P 5.00/bag

Average Annual Receipts	P112,500
=====	

SCHEDULE 9

Annual Drying Costs of Rotary Flash Dryer

Total Variable Cost/Day	P 269.90
Add: Total Fixed Costs	125.72

Total Production Costs per Day	P 395.62
Capacity in Bags per day for 10 hours	125.00

Unit Production Costs	P 3.16
Total Estimated Production for 6 months at 30 days/month	22,500.00

Total Drying Costs	P 71,211.60
=====	

SCHEDULE 10

Annual Estimated Charcoal Briquetting Production Costs

Total Variable Costs (Schedule 12)	82,955
Add: Total Fixed Costs	44,000

Total Production Costs	140,920
Estimated Annual Capacity/Production	240,000

Production Costs/Kgs.	0.59
	=====

SCHEDULE 11

Operating Cost Analysis of Rotary Flash Dryer as of
January 1991

MODEL	RD-77D
CAPACITY (Sacks/Hour)	10-15
INVESTMENT COST IC (Peso)	
Dryer	115,000
Deisel Engine	15,000

Total	130,000
FIXED COSTS PER DAY	
Depreciation /1	64.36
Repair and Maintenance /2	7.15
Interest on Investment /3	43.50
Insurance /4	10.71

Total (a)	125.72

VARIABLE COSTS PER DAY	
Labor /5	112.50
Fuel /6	10.00
Diesel /7	147.40

Total (b)	269.90

TOTAL COST PER DAY (a+b)	395.62
	=====
CAPACITY (sacks/day)/8	125
	=====
DRYING COSTS PER SACK AT BREAK-EVEN	3.16
	=====
PAYBACK PERIOD IN YEARS	4.13
	=====

- /1 Straight line method with 10% salvage value and 5 years life span
- /2 2% per annum
- /3.12% of Investment Cost (IC)
- /4 3% of Investment Cost (IC)
- /5 Three helpers at P30.00/8 hour day each
- /6 Rice hull consumption rate of 4 sacks/hour at P0.25/sack
- /7 8hp diesel engine at 2 liters per hour (P7.37/liter)
- /8 At an average throughout capacity of 12.5 sacks/hour
- /9 Based on the current commercial drying fee lower by P1.00 in Iloilo of P6.50/sack operating at 10 hour per day, 25 days per month and 6 months per year.

SCHEDULE 12

**Operating Cost Analysis of Charcoal Briquetting Machines
As of January 1991**

CAPACITY	1 ton per day
INVESTMENT COST/1 IC (Peso)	100,000
FIXED COSTS PER YEAR	
Depreciation /2	18,000
Repair and Maintenance /4	10,000
Interest on Investment /3	12,000
Insurance /5	3,000
Total (a)	43,000
VARIABLE COSTS PER YEAR	
Labor /6	38,400
Fuel /7	28,800
Electricity /8	30,720
Total (b)	97,920
TOTAL COST PER DAY (a+b)	140,920
CAPACITY (kg/year)/8	240,000
OPERATING COSTS PER KILOS AT BREAK-EVEN	P 0.59
PAYBACK PERIOD IN YEARS at P1.00/kgs.	0.8 year

/1 Includes the following: carbonizer, cooler, grinder, mixer, briquetting machine and tray driver.

/2 At 10% salvage value and 5 year life span.

/3 At 12% p.a. of IC

/4 10% of Investment Cost (IC)

/5 3% of IC

/6 2 operators at P80.00/day, 20 days/month and 12 months/year.

/7 At fuel consumption rate of 1 sack/man P0.25/sack, 8hours/day 20days/month and 12months/year.

/8 At a consumption rate of 5 hp at P 3.20/kw-hr, 8hours/day, 20days/month and 12months/year.

SCHEDULE 13

Warehouse and Processing Plant Building
Bill of Materials and Cost \Estimates

Quantity	Description	Unit Price (P)	Amount
Concrete Works:			
10,000 pcs.	6 x 8 x 16 chb	4.80	48,000.00
2,811 bags	Portland Cement	85.00	238,935.00
253 cu. m.	Sand	90.00	22,770.00
340 cu.m.	Gravel	110.00	37,400.00
80 trucks	Boulders	120.00	9,600.00
292 cu. m.	Sandfill	70.00	20,440.00
			377,145.00
Bars:			
584 pcs	3/4"0 x 20	132.00	77,088.00
756 pcs	3/8"0 x 20	54.00	40,824.00
443 pcs	5/8"0 x 20	98.00	43,414.00
212 pcs	1/2"0 x 20	70.00	14,840.00
			176,166.00
Corr. GI Roofing:			
380 shts	26 x 32 x 12	175.00	66,500.00
50 shts	26 x 32 x 6	158.00	7,900.00
20 pcs	Ridge Roll	120.00	2,400.00
20 pcs	G.I. Gutter	120.00	2,400.00
			79,200.00
Stridding:			
280 pcs	746.66 badger 2 x 2 x 28	38.50	10,780.00
Form Plywood:			
100 pcs	1/4 x 4 x 8	136.00	13,600.00
Miscellaneous:			
1,000 pcs	1/2"0x12		
Bolts and Washers	62.00	32,000.00	
4 pcs	Railing Bar	850.00	3,400.00
50 gals.	Wood Preservatives	880.00	44,000.00
30 pcs	3/8" x 1 x 2 Angular	182.00	5,460.00
12 shts	3/8"x4x8 Steel plt	1,800.00	21,600.00
			106,460.00
SUB- TOTAL TO BE FORWARDED			763,351.00

SCHEDULE 13

Warehouse and Processing Plant Building
Bill of Materials and Cost Estimates

continued...

Quantity	Description	Unit Price (P)	Amount
Balance forwarded			763,351.00
Roofing Nails:			
320 kgs	2-1/2"corr. GI nails	27.50	8,800.00
80 kgs	CWN 4"	27.50	2,200.00
100 KGS	CWN 6"	27.50	2,750.00
5 kgs	CWN 1"	29.00	145.00
			13,895.00
Lumber:			
124 pcs 5,208 bd.ft	2 x 8 x 18	14.00	72,912.00
59 pcs 446.25 bd.ft	3 x 3 x 10	14.00	6,247.50
89 pcs 1,335 bd.ft	3 x 3 x 20	14.00	18,690.00
36 pcs 258 bd.ft	2 x 8 x 6	14.00	3,612.00
27 pcs 486 bd.ft	1 x 12 x 18	14.00	6,804.00
10 pcs 200 bd.ft	1 x 12 x 20	14.00	2,800.00
2 pcs 20 bd.ft	1 x 12 x 10	14.00	280.00
2 pcs 24 bd.ft	1 x 12 x 12	14.00	336.00
12 pcs 175.3 bd.ft	2 x 4 x 22	14.00	2,454.20
12 pcs 119.9 bd.ft	2 x 8 x 14	14.00	1,679.86
8 pcs 144 bd.ft	2 x 6 x 18	14.00	2,016.00
			117,831.56
Electrical:			
41 pcs	Receptacles	35.00	1,435.00
6 pcs	Light Bulb 50 w	62.00	372.00
35 pcs	Flourescent Bulb 20w		
	with assembly	422.00	14,770.00
2 pcs	Convenient Outlets	56.00	112.00
8 pcs	Convenient Switch	56.00	448.00
1000 m	PDX AWG Wire #12	14.50	14,500.00
1 pc	Main Safety Switch	1,500.00	1,500.00
500 m	THW AWG #8	26.00	13,000.00
10 pc	Elec. Conduit Pipe	52.50	525.00
10 boxes	Elec. Tapes	38.00	380.00
10 boxes	Elec. Wires	25.00	250.00
			47,292.00
TOTAL COSTS OF MATERIALS			942,369.56
LABOR COST AT 25%			235,592.39
CONTINGENCIES AT 3%			28,271.09
TOTAL COST OF BUILDING			1,206,233.04

SCHEDULE 14

**Comparative Earnings of Individual Farmer Members
Between Immediate Sale of Produce Against Processing Before Sale
One Cropping Cycle**

	Immediate Sale	Processed Before Sale
Average Harvest/Production 148 cavans 50kgs/cavan	7,400	7,400
Less: Cost of Harvesting and Threshing 14% of gross production	1,036	1,036
Irrigation Fee (125 kgs)	125	125
Home Consumption 4 cavans/month for 6 months	1,200	1,200
Total Deductions	2,361	2,361
Net Production	5,039	5,039
Average Market Price of Produce at Farm Gate	P 4.5/kg	
Gross Income from Farming (A)	P 22,676	
Estimated Shrinkage Allowance at 12%		605
Net Weight of Paddy Ready for Processing		4,434
Recovery Rate after Processing		68%
Estimated Minimum Recovery in kgs		3,015
Selling Price of Paddy at the Local Market ex-warehouse		P 10.00/kg
Gross Income from Sale of Processed Paddy (B)		P 30,150
Add: Income from Sale of Rice Bran a by-product of processing estimated at 7% with selling price of P3.10/kg		962
Gross Income from Processing of Paddy (C)		P 31,112
Less: Production and Processing Costs		
Milling Fee at P0.40/kg		1,206
Drying Expenses 101 cavans at P5.00/cavan		505
Transportation Costs 101 cavans at P3.00 /cavan (from farm gate to warehouse)		303
Average Production Costs	12,080	12,080
Interest on Production Loan at 18% per annum for 6 months (market rates)	1,087	1,087
Commission Charges by the Coop P1.00/cavan		60
Total Production and Processing Costs	13,167	15,242
NET INCOME FROM FARMING	9,508	15,871

EXHIBIT #1

FUNCTIONS OF MANAGEMENT STAFF

1. **Managing Director/General Manager** - is responsible of the overall operations of the cooperative. He is tasked to implement all the policies formulated by the Board of Directors and the General Assembly.
2. **Treasurer/Cashier** - is the cash custodian of the cooperative and is responsible to received and disburse the funds as authorized in the daily conduct of the coop's operation.
3. **Accountant** - is responsible in recording the daily transactions/activities of the cooperative and submit the necessary financial statement of the cooperative, monthly, and yearly.
4. **Trading /Procurement Officer** - has the obligation to determine the stocks needed by the members, the price of the commodities acceptable to the members, the prevailing price for the marketable goods. He is also responsible in looking for markets wherein the members could sell their produce favorably.
5. **Warehouseman** - He is the stocks custodian of the cooperative. He is responsible for the safekeeping of stocks deposited by the members and the proper accounting of the stocks withdrawn in the warehouse. He will maintain records for

audit for both the internal and external auditor of the cooperative.

6. **Weigher/Classifier** - He is responsible for the proper weighing and classifying of the produce delivered and deposited by the members in the warehouse.
7. **Security Guards** - responsible for the safeguarding of the physical property of the cooperative. They will also maintain a record of those coming in and out in the warehouse as well as in the office.
8. **Ricemill/Machine Operators** - Responsible for the overall maintenance and safeguarding of plant machineries. He operates the plant as specified or instructed by members and clients subject to the operating procedures formulated by the Board of Directors and the General Assembly.

Exhibit 2

FARMER'S SAVINGS FUND

YEAR #	FARMERS	SAVINGS FUND	CUMULATIVE TOTAL
1	1,410	P 105,750	P 105,750
2	1,410	211,500	317,250
3	1,410	211,500	528,750
4	1,551	232,650	761,400
5	1,706	255,915	1,017,315
6	1,876	281,506	1,298,821
7	2,064	309,657	1,608,478
8	2,270	340,623	1,949,101
9	2,498	374,685	2,323,786
10	2,747	412,154	2,735,940

NOTE:

1. There are 1,410 target beneficiariaries for this project. The target savings for the first year is only at 50% since the organization will start only on the second crop.
2. The initial farmers will be required to save one half cavan per crop valued at ₱150.00.
3. The target increase in the number of membership is at 10% starting on the fourth year the cost of palay is also expected to increase on the same proportion

XHIBIT 3

PRODUCTION COST PER HECTARE PER CROPPING SEASON

Land Preparation P. 2,230.00

Farm Inputs:

Seeds (4 sacks at 400.00/sack)	1,600.00
Fertilizer (10 bags P350.00)	3,500.00
Herbicides & Pesticides, Fungicides	1,720.00
Crop Insurance Premium	300.00
	<hr/>
	P 9,350.00

Farmers Equity:

Sowing/Transplanting (10per.xP35x2days)	700.00
Application of fertilizers & Chemicals (2per.xP35x11days)	770.00
Weeding /Re-planting (6perxP35x11days)	1,260.00
	<hr/>
	P 2,730.00

GRAND TOTAL P 12,080.00
=====

EXHIBIT 4

PADDY PROCESSING PLANT SPECIFICATIONS AND QUOTATION
January 1991

Item	Quantity	Description	FOB Manila
1.	2-units	Paddy husker,	
2.	1-unit	Paddy Separator	
3.	1-unit	Friction Type Rice Whitener	
4.	1-unit	Rice Refiner	
5.	1-lot	Rice Milling Accessories, comprising:	
		1-unit Steel Bucket Elevator	
		1-lot Husk Ductings	
		1-lot Bran Collecting System	
		2-sets Blowers	
		1-lot Rice Ducts	
		1-set Paddy Husker Base	
		1-set Polisher Refiner Base	
		1-unit Rice Sifter	
		1-set Control Panel	
		1-lot In-mill Wiring and Insulation	
6.	1-lot	Electric Motors and Controls	
7.		Electrical and Mechanical Installation Services	

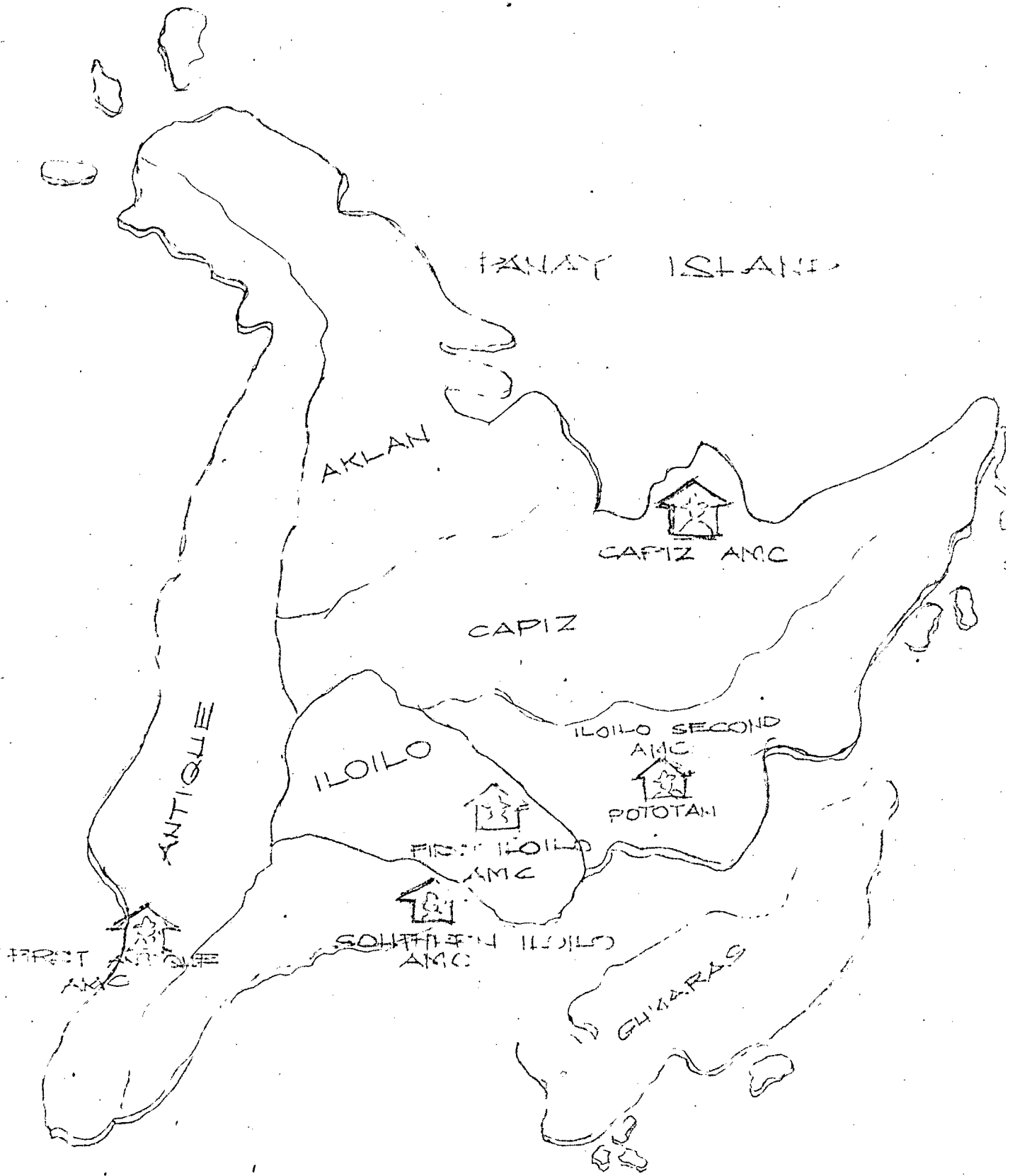
TOTAL PRICE FOB MANILA - - P 1,700,000.00

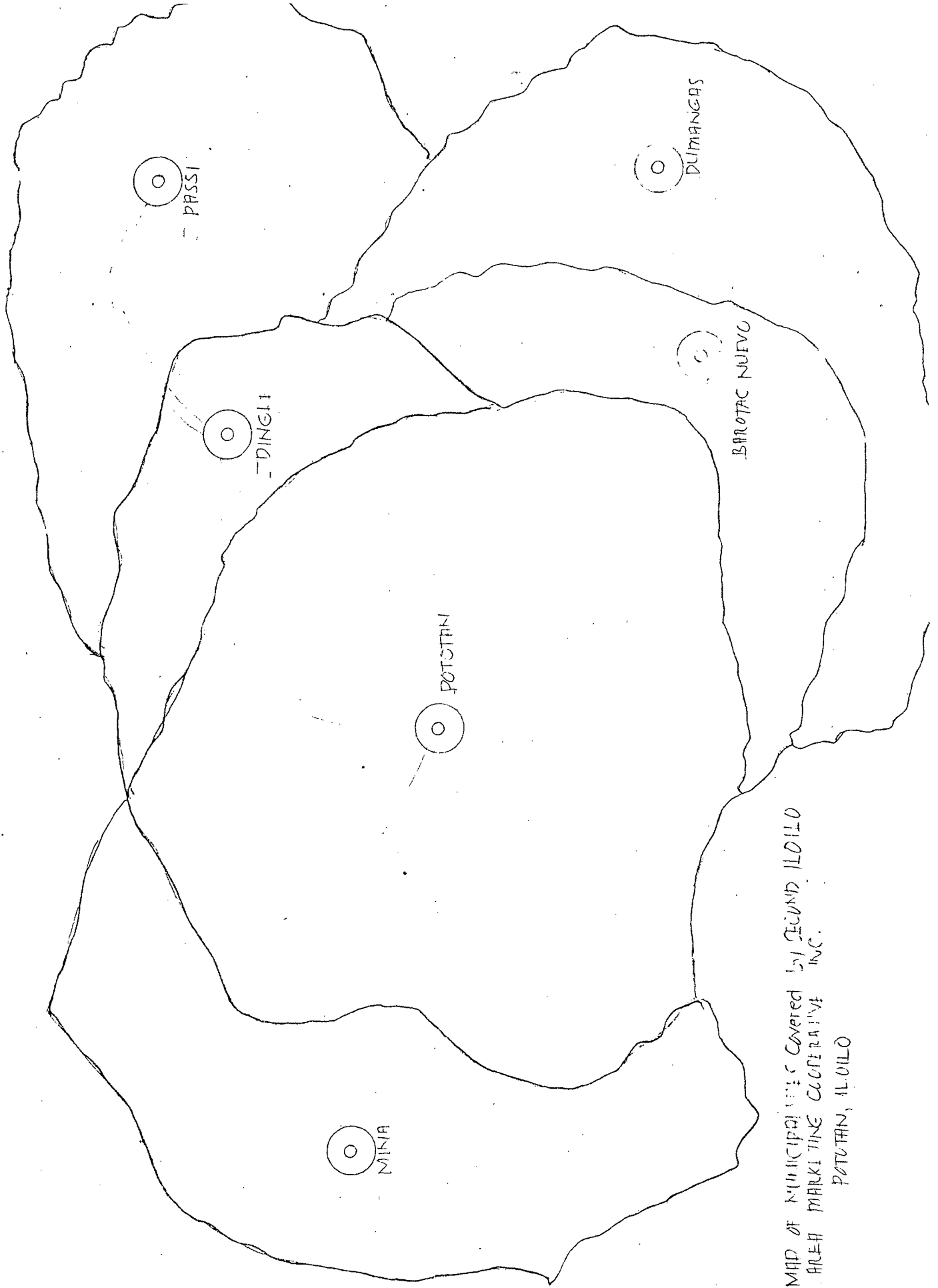
Cost of Freight and Handling to be undertaken by the coop.

Estimated Cost - - 5% of the Cost - - P 85,000.00

REMARKS:

1. Payment - Cash
2. Delivery/
Installation 90-120 working days from receipt of initial payment signing of contract.
3. Exclusion - Pit excavation and concrete foundation, if any, is for buyers account.
4. Validity - Subject to suppliers final confirmation.

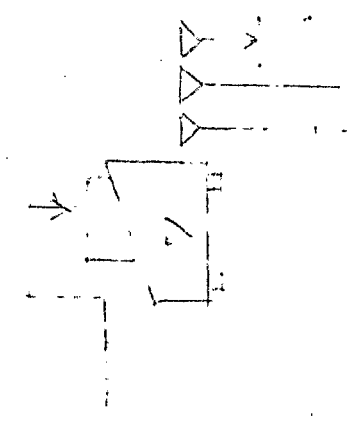
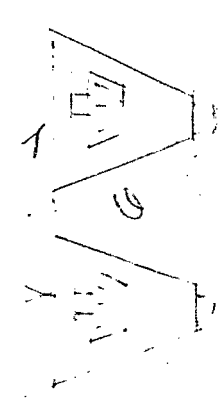
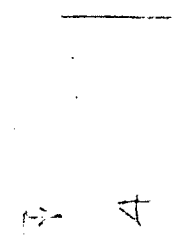
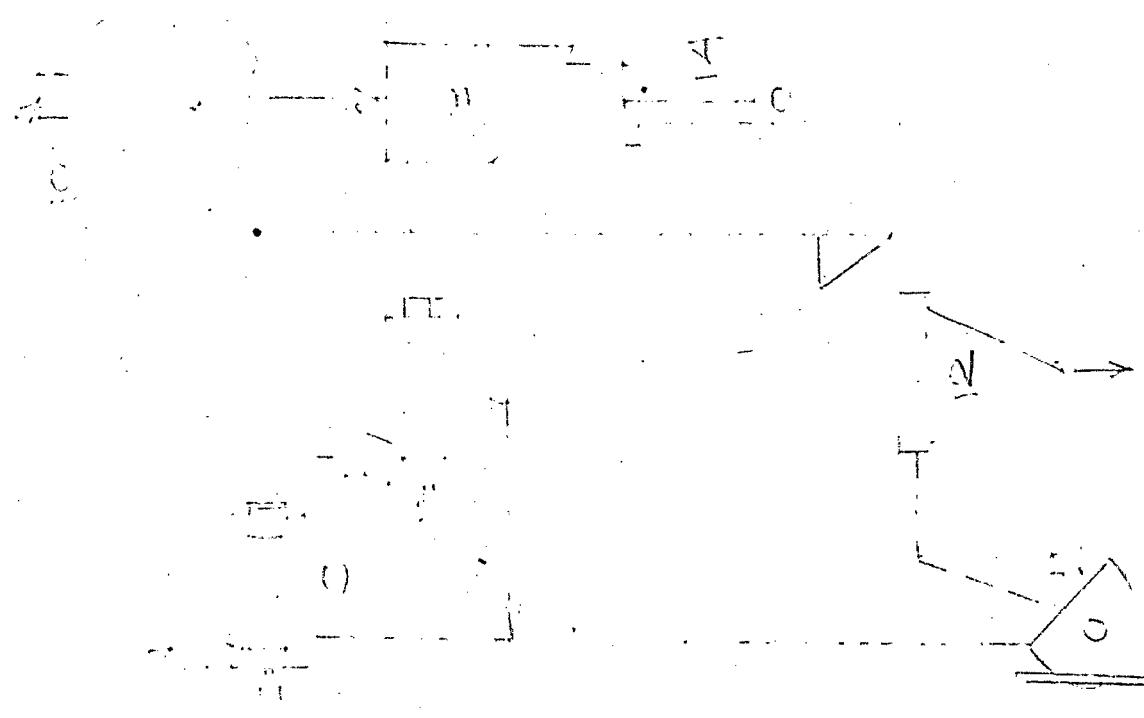




MAP OF MUNICIPALITIES COVERED BY SECUND ILOILO
AREA MARKETING COOPERATIVE INC.
POTSTAN, ILOILO

3

9



17	CONO RADDOY CHESTNUT	14	LOCALITE
18	CONO SIONE HUNKEY	12	LOCALITE TANK
19	RIEHEBY HUNKEY	10	PISTON CYLINDER
20	PISTON CYLINDER	11	PISTON SECTION
21	PISTON SECTION	13	PISTON SECTION

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: INTEGRATED PADDY PROCESSING <i>and</i> MARKETING PROJECT
<i>COUNTRY</i>	: PHILIPPINES
<i>PROJECT PREPARED BY</i>	: EDITH SUSAN VALDEZ

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

Headquarters:

Route des Morillons 15
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Geneva, Switzerland

Regional Office for Asia & the Pacific

'Bonow House'
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ACKNOWLEDGEMENT

I would like to extend my sincerest gratitude and appreciation to the full support of all the members of the Board of Directors of the Cooperative Rural Bank of Ilocos Norte, Inc., and to the Management staff as well.

Moreso, I'd like to expressed my unequalled thanks to the INTERNATIONAL COOPERATIVE ALLIANCE for giving me the very rare opportunity to be one of the participant of this training.

To our Project Director, M.V. MADANE and staff for their unending assistance.

To the COOPERATIVE UNION OF THE PHILIPPINES, headed by the energetic General A.S. LOZADA and his staff for their moral support.

My sincerest thanks and grateful appreciation to our programme faculty of the Indian Institute of Management, who have conveyed to us their precious knowledge, skills and expertise in the field of cooperative management.

To the Small Farmers Development Center and staff under the active leadership of Engr. Ben Cruz, with special thanks to Mr. Alex Kimpo and Mr. Agapito Guanlao.

To the different agencies, like the Northern Foods Corporation, Department of Agriculture, National Food Authority, Bureau of Agricultural Extension, Municipal Agricultural Officers of San Nicolas, Dingras, Solsona, Marcos and Espiritu for their assistance in data generation.

To my loving HUSBAND who shares his loving thoughts and care, my CHILDREN who serves as my inspiration to undergo this rigid training.

To all my friends and peers who in one way or another gave me a helping hand.

Most of all, to our DEAR ALMIGHTY CREATOR who had given me the strength and good health, who guided me all throughout the duration of this training and to the future implementation of this program and to our daily labours.

EDITH SUSAN VALDEZ
Trainee

Philippines, February 1991

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A p p e n d i c e s : Map

A. List of Participating Farmers Coops

Figure 1 : Project Organizational Structure

2 : Project Management Structure

Exhibit 1 : Total Project Cost and Source of Training

2 : Projected Income Statement

3 : Projected Cashflow Statement

4 : Projected Balance Sheet

5 : IRR Computation

Schedule 1 : Fixed Assets

2 : Procurement, Drying, Milling Recovery

3 : Variable Cost

4 : Fixed Cost

5 : Administrative Expenses

6 : Salaries and Benefits

7 : Depreciation Schedule

8 : Amortization Schedule

9 : Training and Skills Development

10 : Marketable System per Hectare

11 : Procurement Fund Requirement

12 : Production Requirement per Hectare
and Sources of Financing

13 : Comparative Cost and Return Analysis
per Hectare

D I A G R A M S

Flow Chart - Palay Production

Processing - Marketing

Plant Lay-Out

Biomass Heating

System Model SA

Mechanical Dryer

Chapter 1. SUMMARY

- 1.1 The paddy farmers of Ilocos Norte, as elsewhere in the Philippines, have not successfully achieved economic take-off for the following reasons:
- farm income is confined exclusively to production; no share in benefits derived from processing and marketing;
 - income from production is substantially reduced due to low productivity, high cost of credit, and low price of palay.
- 1.2 The project is designed to change the situation by giving the farmers greater control of the farm business. It will build up the capability of organized farmers to undertake the following:
- farm credit delivery
 - farm input distribution
 - palay procurement, processing and marketing
- 1.3 INFFCI will be the lead implementing organization, to be assisted by SFDC, the project consultant. It will tap CRBIN to implement the lending component of the project. It will also tap the FAs/FCs as its implementing arms at the barangay level.
- 1.4 To effectively perform its processing functions, INFFCI shall acquire the following equipment/facilities:
- | | | |
|-----------------------|----------|----------------------|
| Central warehouse | 1 unit | 24,000 bags capacity |
| Satellite warehouses | 10 units | 1,000 " " |
| Mechanical silo dryer | 1 unit | 40 mt/day " |
| Ricemill | 1 unit | 3 mt/hr. " |
| Delivery vehicles | 1 unit | 3-5 tonner |
| | 1 unit | 10 " |
- Other equip't/access.
- 1.5 Production loan assistance at P 4,500/ha. will initially cover 1,200 has. of riceland located in 20 barangays of the 5 municipalities of Ilocos Norte.
- 1.6 The volume of palay to be procured and processed on the first year of operation is 6,000 mt., to increase by 5% yearly.
- 1.7 Portion of the production loan to be released in kind will constitute the working capital for INFFCI's farm input distributorship, which will cater initially to the farm input requirement of the project beneficiaries.

1.8 Foreign funding will be tapped to provide 59% of the initial investment, with the balance to be provided through local counterpart, namely: INFFCI/FOs/Farmers (30%), CRBIN (5%), and government/LBP (7%).

1.9 Foreign funding is being requested as grant, since the orientation of INFFCI's business operations is primarily service, with profit being only a secondary motivation.

1.10 LBP and CRBIN, being financial institutions, shall provide funding support in the form of soft loans.

1.11 Project life is assumed to be 10 years, and 4 months will be needed for the pre-implemetation/construction phase.

1.12 Financial Analysis

Payback Period	:	3 years and 8 months
Breakeven Volume	:	1,697 mt.
IRR	:	15.6%
BCR (at 12%)	:	1.7
Increase net income to farmers	:	more than 100%

1.13 Sensitivity Analysis

Recovery rate	:	65% - 63%
Prices (reduced)	:	
milled rice	:	₱ 9,000/MT - 8,500 MT
rice bran	:	4,000/MT - 3,500 MT
BCR (at 12%)	:	.62
IRR	:	2%

Chapter 2. BACKGROUND/RATIONALE

2.1 Overall Situation

- 2.1.1 Agriculturally, the economy of the Ilocos Province is backed by 32,750 has. of developed farmlands, of which 12,000 has. are irrigated the whole year round, with the remainder depending on rain water.
- 2.1.2 The cultivated areas are fragmented into small farmlots tilled by owners and/or tenants. Average farm area is 0.75 hectare.
- 2.1.3 Agriculture is the main industry, with rice as the principal crop. Other crops widely planted are garlic, tobacco and tomatoes.
- 2.1.4 In the upland and hilly areas cultivated by forest stewardship holders, annual and permanent crops are raised simultaneously with livestock and poultry.
- 2.1.5 Relatively the Ilocano farmer by the nature of his resources is a multi-crop and multi-industry producer.
- 2.1.6 Strong rural associations exist in the area, like farmers associations/cooperatives, rural improvement clubs and kabataang barangays.

2.2 Situation of the Project

- 2.2.1 The project area is located around 485 kms. from Manila, and about 15 kms. from Laoag City, the capital of Ilocos Norte, which is the nerve center of trade, commerce, business, industry and education in the province.
- 2.2.2 The climatic condition in the area is categorized as Type 1. Dry season is from December to April, and wet season the rest of the year. Average annual rainfall is 2,067.2 millimeters, with temperature at 26.8 degree celsius.
- 2.2.3 Major Crop Production

<u>Commodity (tons)</u>	<u>1989</u>	<u>1990</u>
Rice	238,611	243,879
Tomato	41,259	59,607
Garlic	16,910	20,384
Corn	24,752	12,040
Mungo	7,456	9,357
Peanut	3,296	5,043
Tobacco	2,062	3,935

2.2.4 Processing

Most of the ricemills in the area are single-pass with less than 1-ton capacity and are owned by private traders/millers. There are only two multi-pass ricemills with 5-ton capacity, one is a government-owned NFA ricemill and the other privately owned.

2.2.5 Drying

Palay are dried in the area through the use of solar drying facilities. There is only one NFA mechanical drier, which is presently inoperational.

2.2.6 Trucking

There are enough trucking facilities in the area which are usually owned by a few wealthy families.

2.2.7 Warehousing

There are only a few big warehouses in the area, 2 of which are owned by NFA.

2.2.8 Marketing

Most of the major crops in the area, except for tomato which is being bought by NFC (a fruit processing plant), are marketed through traders and middlemen. Palay are usually bought by private traders and brought to the provinces of either La Union or Pangasinan for milling.

2.2.9 Other Income Generating Activities

Other income generating projects in the area are mat weaving, embroidery, tanning and pottery making. Cloth weaving like the weaving of Ilocano barongs and dresses has remained a lucrative job for many women. The tanning industry has also helped manufacturers of footwears, blacksmiths and calesa makers.

Livestock raising such as poultry, goat and duck raising has also been a source of additional income for the farmers.

2.2.10 Investment Potentials of the Area

The following projects sustainable by local resources of the area have been identified as viable for investment:

- a) The wine distillery to serve as the bottling, packaging and marketing center for the small

producers of native wine known as "basi" or of high grade dry gin known as "arak".

- b) The paper factory using "salago" (wixtroemia sp.) as raw material for producing high grade paper. Salago grows widely in the Ilocos forest.

2.3 Problems Faced By Farmers

2.3.1 Low Income from Palay Production

Several factors combine to substantially reduce the income of the farmers from palay production, namely:

- a) High Cost of Credit

Being non-bankable, around 70% of the farmers in the area borrow from private money lenders who charge an exorbitant rate of interest. An amount of ₱100.00 borrowed during planting time is repaid at ₱250 - ₱300 right after harvest, or after a period of 4 - 6 months.

- b) Low Productivity

Lack and high cost of credit usually forces the poor farmer to save on farm inputs. At times it also means untimely application of farm inputs. Palay production in the area is thus rather low, ranging from 3 - 4.5 mt. or an average of 4 mt.

- c) Low Buying Price of Palay

The poor farmers are often in immediate need of cash. Hence, they have to sell their produce at harvest time even if the price of palay is at a low level. The situation is worse if he has borrowed from a private money lender, for then the farmer is bound to sell his produce to the creditor, who usually buys it at ₱ 4.50 - 4.90/kgm.(dried), much below the government support price of ₱ 6.00/kgm.

- d) Confined to Production

The income of small farmer is usually confined to production. He does not share in the income derived from the processing and marketing of his farm produce. This goes to traders/millers who oftentimes are non-farmers or are rich farmers. This is so since the small farmers do not have the financial capability to mill/market their produce.

2.4 Project Justification

This project is designed to substantially increase the income of the farmers, enabling them to attain economic take-off and to sustain it towards greater progress. The main strategy is to build up the farmer's capability to exercise greater control over their farm business, thus maximizing their share in the benefits arising from their production activities. The scope of control will cover the production, processing and marketing aspects of the rice business.

To increase farmers' income from palay production, the project will make low cost credit and supply of farm inputs more accessible to the farmers, and will buy their palay at a reasonably higher price. This it will do by:

- Strengthening the capability of the farmers' coop bank, that is, the Cooperative Rural Bank of Ilocos Norte (CRBIN), to extend production loan to the farmers;
- Reviving the dying Ilocos Norte Area Marketing Cooperative, Inc. (INAMCO), re-organizing it into Ilocos Norte Federation of Farmers Cooperatives, Inc. (INFFCI), and re-building its capability to undertake farm input distribution and palay procurement.

To enable the farmers to share also in the benefits derived from the processing and marketing of their produce, the project will also build up the capability of INFFCI to undertake rice processing and marketing.

Moreover, to enable the organized farmers to eventually achieve self-reliance, capital build-up formation will be made an integral part of project implementation.

Briefly, the project is designed to achieve the following benefits:

- a) increased farmers' income through:
 - higher farm productivity
 - lower cost of credit
 - cheaper and reliable supply of farm inputs
 - higher price of palay
 - share in the income derived from processing and marketing
- b) greater farmers' control of farm business:
 - farm credit/input delivery system
 - palay procurement, processing and marketing
- c) institutional build-up of participating farmers organizations and gradual achievement of self-reliance

Chapter 3. THE PROJECT

3.1 Objectives

- 3.1.1 The general objective of the project is to enable the farmers of Ilocos Norte to achieve economic take-off through effective control of farm business.
- 3.1.2 The specific objectives are as follow:
- a) To expand CRBIN's farm credit delivery system so that more farmers could be provided with adequate and timely production loan assistance at lower interest rate;
 - b) To re-activate INFFCI's farm input distributorship so as to ensure cheaper and reliable supply of farm inputs to the farmers;
 - c) To build up the capability of INFFCI so as to expand its business operations to engage in the following for the greater benefits of the farmers:
 - palay procurement
 - trucking, drying, milling and warehousing
 - rice trading
 - d) To undertake institutional strengthening of INFFCI and its participating member-organizations
 - e) To develop financial self-reliance through continuous capital build-up formation

3.2 Area of Operation

The project shall initially cover 1,200 has. riceland located in 20 barangays of the 5 municipalities of Ilocos Norte, namely, Dingras, Espiritu, San Nicolas, Marcos and Solsona (See Appendix A for names of barangays). The project area selected is known as the rice granary of Ilocos Norte. All the project sites are within the radius of 30 kms.

3.3 Project Components

3.3.1 Production Loan Assistance

Farmer-beneficiaries will be provided with production loan assistance in support of their production activities.

The project's production loan requirement shall be sourced as follow: foreign funding - 50%, Land Bank of the Phils. - 35%, and CRBIN - 15%.

CRBIN, the farmers' coop bank, will be tapped to implement the project's farm credit delivery system. It shall wholesale the loan assistance to the beneficiary-organizations at 6% interest rate p.a., who in turn will retail it to member-borrowers at 12%. Loan maturity will be 6 months. Loan ceiling shall be ₱4,500/ha. The loan will be released in cash (for payment of land preparation) and in kind (farm inputs). As loan security, the farmer-borrower shall assign his crop insurance proceeds in favor of CRBIN, and shall sign a deed of undertaking committing to sell at least 2 mt./ha. of his palay produce to INFFCI and authorizing the latter to deduct his loan payment from the sales proceeds.

The loan is renewable at the start of each cropping period.

CRBIN shall share 50% of the interest income with INFFCI.

3.3.2 Farm Input Distributorship

INFFCI shall act as distributor of farm inputs to farmers associations/cooperatives (FAs/FCs). To make this possible, CRBIN shall release to INFFCI the amount equivalent to the portion of the loan allocated for the purchase of farm inputs. This shall be used by INFFCI as initial working capital for its farm input distributorship. INFFCI shall therefore act as channel of CRBIN for the release of the input portion of the loan to the FAs/FCs.

This scheme shall likewise make it possible for the FAs/FCs to engage in farm input dealership.

3.3.3 Palay Procurement and Processing

a) Palay Procurement

INFFCI's operations shall be expanded in order to engage in palay procurement and processing. It shall enter into a marketing agreement with FAs/FCs committing itself to buy at least 2 mt./ha. of the farmer-beneficiaries' produce. Foreign grant shall be tapped to finance 85% of the initial procurement fund, with the remaining 15% to be financed through loan from CRBIN at 12% p.a. payable in 3 years.

b) Trucking

INFFCI's capability shall likewise be expanded through the acquisition of a 5-tonner truck to be used for transporting the palay from the satellite warehouses to the central warehouse. It could also be used for the delivery of farm inputs.

c) Warehousing

INFFCI shall expand its existing warehouse located in San Nicolas by doubling its capacity. This central warehouse shall be used as storage for its stock inventory, such as palay, clean rice and farm inputs. It shall also house its ricemilling and drying facilities.

Moreover, INFFCI shall set up 10 multi-purpose satellite warehouses to be strategically located in the barangays being covered. This will serve as temporary storage for palay and farm inputs. A portion will also be used as store outlets for its products.

d) Palay Drying

To enable INFFCI to dry its procured palay before milling, a mechanical silo drier shall be procured. It shall be housed in the central warehouse/ricemill complex.

e) Ricemilling

A ricemill shall likewise be acquired to enable INFFCI to engage in ricemilling activities. This is a vertical integration of its business undertakings.

3.3.4 Rice Trading

INFFCI shall likewise engage in rice trading in order to market its milled rice. This is another vertical integration of its business operations.

INFFCI shall acquire a bigger truck (10-ton capacity) for this purpose. A foreign grant shall be tapped for possible financing.

3.3.5 Institutional Development

To strengthen the institutional and management capability of INFFCI and the participating FAs/FCs, to effectively and efficiently implement the project, continuing education and training shall be provided. (Refer to Schedule 9 for more details).

INFFCI shall tap the services of Small Farmers Development Center, Inc. (SFDC), its project consultant, to implement the institutional component.

A foreign grant shall be tapped to finance the first year institutional development activities. An institutional development fund shall likewise be established, coming from 10% of INFFCI's net income.

3.3.6 Capital Build-Up Formation

Capital build-up formation (forced savings) shall be undertaken by the farmer-beneficiaries at the end of each cropping period. This is in the amount of P240/ha. This shall automatically deducted from the farmer's sales proceeds. This shall be considered as additional share capital contribution.

The FA/FC shall likewise deposit 50% of the additional share capital collected from the members as its additional share contribution to INFFCI (25%) and to CRBIN (25%).

The capital build-up formation could be a source of additional fund to INFFCI and CRBIN to be used for expanding their business operations. For the FAs/FCs, it could be used to generate more income generating projects or to establish a provident fund for the greater benefits of its members.

Chapter 4. DETAILS OF OPERATION

4.1 Scheme of Operation

4.1.1 INFFCI shall act as the project implementor. It shall however tap the banking facilities of CRBIN, the farmers' coop bank to implement its production loan assistance. Likewise, it shall tap the services of SFDC, its project consultant, in implementing its institutional development program.

4.1.2 Farm Credit/Input Delivery System

INFFCI shall pass on to CRBIN the foreign funding support allocated for palay production loan. CRBIN on its part shall put up its 15% equity counterpart, and shall negotiate with LBP for the release of its 35% loan counterpart.

CRBIN shall prepare the lending guidelines and loan documents, and shall brief the participating FAs/FCs regarding the project's lending program.

The member-borrowers shall file their individual loan applications with their respective FA/FC, who shall process, evaluate and approve them. Based on the approved individual loans, the FA/FC in turn shall file its consolidated loan application with CRBIN, who shall likewise process, evaluate and process them.

CRBIN shall directly release to the FAs/FCs the cash portion of the approved loan, who shall release them to the member-borrowers based on their individual farm plan and budget.

The amount however equivalent to the input portion of the loan shall be released to INFFCI who shall use it as initial working capital for its farm input distributorship. INFFCI shall release the input portion of the loan to the FA/FC based on its consolidated farm plan and budget. The FA/FC shall be responsible for releasing the farm input requirements to its member-borrowers, based again on their individual farm plan and budget.

Loan payment shall be deducted by INFFCI from the sales proceeds of the farmer-borrowers' palay. It shall remit the collection to CRBIN.

4.1.3 Palay Procurement and Processing

A marketing agreement binding the farmer-borrower to sell at least 2 mt./ha. shall form part of the loan package. The FA/FC shall see to it that this agreement is followed. Hence, at harvest time it shall collect the required amount from its member-borrowers and have them stored at the multi-purpose satellite warehouse.

INFFCI shall pay for the procured palay and arrange for its transport to the central warehouse.

INFFCI shall be responsible for the drying and milling of the procured palay, using the drying and milling facilities located at the central warehouse.

4.1.4 Rice Trading

INFFCI shall handle the marketing of the rice and its by-product (rice bran). It shall negotiate with the identified outlets, and shall take care of its delivery.

4.1.5 Institutional Development

INFFCI shall pass on to SFDC the portion of the funding support needed to finance the project's institutional development/training program.

SFDC shall implement the program, securing the human and material resources needed for its effective implementation.

4.1.6 Capital Build-Up Formation

INFFCI shall be responsible for implementing the capital build-up formation by deducting it from the farmer-beneficiaries' sales proceeds at harvest time. It shall remit the amount collected to CRBIN for deposit, who shall duly credit in the name of the farmer-borrowers.

4.2 Technical Aspects

4.2.1 Palay Production

a) Yield

Palay production yield in the area is 80 cavans (4 metric tons) per hectare per cropping season in the irrigated areas, and 60-70 (3-35 mt)cavans per hectare for the non-irrigated areas. With the implementation of the project the estimated average yield is projected to increase to 90 cavans/hectare per crpping (4.5 Mt) due to the introduction of improved palay production

technology, particularly in the adequate and timely application of farm inputs.

~~b) Cropping Pattern~~

There is an average of 2 croppings per year. First cropping (wet season) starts in May - June and harvest comes late October to December. The second cropping (dry season) begins in late November to February and harvest begins from March to May.

c) Production Area

The project shall initially cover 1,200 has. located in 20 barangays of the 5 municipalities of Ilocos Norte. (Refer to Appendices A & B). The project coverage is expected to increase by around 5% yearly due to increased capitalization coming from capital build-up fund and retained earnings.

~~d) Palay Production Technology~~

~~Existing technology is fairly advanced. However, the farmers will be further trained to use improved technology. The technology to be applied shall be as follow:~~

- Use of certified seeds of high yielding varieties(HYV)
- Full and timely application of recommended soil energizer and pesticides
- Mechanized farming and use of modern post-harvest facilities

e) Availability of Farm Inputs

~~There are several manufacturers and distributors of farm chemicals and fertilizers in the country. The federation will source out its farm input supply directly from the manufacturers and distributors so as to avail of price discounts and timely delivery of inputs.~~

4.2.2 Palay Procurement

The marketable surplus per hectare per cropping is estimated at 2.5 mt (Refer to Sched. 10). This is around 50% of the gross produce after deducting the reserve for income consumption, harvester/thresher's share and lease rental/land amortization. The total projected volume of procurement is 60,000 cavans per cropping or 120,000 cavans (6,000 mt.) per year. The palay procurement will increase by 5% annually.

4.2.3 Palay Processing

a) Temporary Storage and Transport

The FA/FC will collect and temporarily store the procured newly harvested palay in the satellite warehouse located at the barangay level. This will be hauled by the 5-tonner truck of the federation to the central warehouse for processing.

b) Mechanical Grain Drying

The fresh palay with moisture content of 20-24% will be dried to reduce the moisture content to 14% using the mechanical silo dryer. The mechanical dryer with a capacity of 40 tons per day will be used in the drying activity. The components of the mechanical dryer are as follow:

- 4 units Drying Silo with a 10 ton capacity each
- Biomass heating system, equipped for rice hull as fuel
- Bucket elevator and bagging bin for loading and unloading of palay
- Electric motor-driven equipment with 3 phase/220 volts power supply

The mechanical grain dryer is an imported equipment with locally made parts. It is being distributed through a local supplier. It is already a tested equipment in the country. The installation of the mechanical dryer, the supervision of the construction of the silo, trial test runs, and the technical skills training of the operator will be handled by the supplier.

c) Rice Milling Plant

A ricemill equipment (multi-pass type) with an input capacity of 3 tons per hour will be used in the operation. The 5,400 mt. of dried palay will be milled within a period of 180 days, with an average of 10 hours per day working schedule.

The rice milling plant will have the following equipment: pre-cleaner, rubber rice huller, abrasive polishers, paddy separator, sifters, pirators and dust collecting systems.

The milling recovery is estimated at 65% of well-milled rice, 12% rice bran and 23% rice hulls.

The rice mill equipment is powered by electric motors with 220 volts/ 3 phase power supply.

The equipment is manufactured locally and easily available. The installation of the ricemill, trial tests and the technical skills training of the ricemill operator will be handled by the supplier.

d) Building and Warehouse Facilities

a. Central Warehouse

The existing warehouse of the federation is a 320 square meters concrete building. This will be extended to 640 square meters to accommodate all the processing facilities and office space for the federation employees.

The space allocation of the central warehouse is as follow:

Ricemill Equipment	-	60 sqms.
Mechanical Dryer	-	60 sqms.
Storage space:		
Palay/rice (1,200 mt. cap.)	-	340 sqms.
Farm inputs	-	60 sqms.
Office space	-	40 sqms.
Working space	-	80 square meters

Inasmuch as palay procurement is programmed over a 3-month period per production cycle, the storage requirement of 3,000 mt. to be procured will only be 1,000 mt. per month. The storage space for palay/rice of 1,200 mt. capacity is therefore adequate to accommodate the storage requirement.

b. Satellite Multi-purpose Warehouse

Ten (10) units of satellite multi-purpose warehouses will be built in strategic location to service the 20 project sites of the production area.

The warehouse will be semi-concrete with an area of 60 sqms.

The warehouse will be used for the following purposes:

- collection center and temporary storage for palay
- distribution center for farm inputs

e) Transport and Delivery Equipment

The federation will need 2 units of delivery truck to service the needs of its members on the

delivery of farm inputs, delivery of palay from the satellite warehouses to the central warehouse, and delivery of milled rice to the market outlets.

The delivery vehicles are as follow:

- 1 unit 6-wheeler truck, with 3-5 ton capacity, imported from Japan, reconditioned
- 1 unit 10-wheeler truck, with 10-ton capacity, imported from Japan, reconditioned

The vehicles are available locally.

f) Other Equipment/Accessories

Equipment and other accessories needed in the rice processing operation will be procured by the federation for the efficient implementation of the project. The list and description of the equipment and accessories is as follows:

- Weighing Scales (12 units): platform weighing scale with 500-kg. capacity; 10 units to be distributed in the 10 satellite warehouses and the remaining 2 units to be used in the central warehouse.
- Moisture Tester (12 units): portable and battery operated, for determining the moisture content of the palay; 2 to be used at the central warehouse and 10 to be distributed in the satellite warehouses.
- Bag Closer (1 unit): portable, single thread; used for packaging of milled rice
- Office and Communication Equipment
 - a. Micro-Computers (2 units), needed to facilitate monitoring, recording and analysis of transactions/project operations;
 - b. Single Side Band Radio Communication, needed to facilitate monitoring of the project implementation, considering the distances of the production sites from the Central Warehouse which is an average of 30 km. radius;

4.3 Marketing Aspects

4.3.1 Supply and Demand Situation

Rice is considered the single most important commodity in the Philippines. It is the major

staple food of the country's 60 million population. The average level of rice production is 5.2 million metric tons for 1986-1988 which is not quite enough to fill up the consumption requirement of 5.4 million metric tons. There is an estimated supply deficit of 263 thousand metric tons, forcing the government to resort to rice importation from Taiwan and other Asean countries.

Volume of domestic rice production, import and export in million metric tons in 1985-1989 is as follow:

Year	Production	Domestic Import	Export
1985	5.76	.54	00
1986	6.05	00	00
1987	5.59	00	.11
1988	5.87	.18	00
1989	6.19	.22	00

Source: Bureau of Agriculture Statistics

4.3.2 Sales Volume

The sales volume for the 1st year is projected a 3,510 mt. of milled rice and 648 mt. of rice bran. The volume of sales will gradually increase by 5% annually. The average monthly delivery over a month period is 585 mt. of rice.

4.3.3 Demand/Market Outlets

The INFFCI target markets are the consumers cooperatives in Ilocos Norte and some institutional buyers such as organized market vendors in the locality. INFFCI will also coordinate with other cooperatives in the region to service the rice requirement of their members. Some of the consumer cooperatives and institutional buyers targetted for rice supply are as follows :

Market Outlets	Monthly Requirement (50 kgs./bag)
1. Credit and Consumers Cooperatives of Ilocos Norte	3,250 bag
2. Coca-Cola Employer Cooperative	400 bag
3. Mariano Marcos State University Coop.	1,000 bag
4. Northern Food Corp. Consumers Coop.	500 bag
5. Benguet Mining Consumers Coop.	500 bag
6. Market Vendors Ass. of Ilocos Norte	5,000 bag
7. Cooperative Rural Bank of	

	Ilocos Norte	250	bag
8.	Divine Word College Credit Coop.	500	bag
9.	Laoag City Employer Multi-Purpose Coop.	1,200	bag
	Total	12,600	bags (630 mt.)

4.3.4 Marketing Program

- 4.3.4.1 The milled rice and rice bran will be sold direct to the consumers/cooperatives and institutional buyers. Marketing arrangement will thus be negotiated with the identified market outlets. By eliminating the role of middlemen in marketing the product, INFFCI will get higher price for its produce and the organized consumers will be able to buy at a lower price.
- 4.3.4.2 The milled rice will be sold at a price a little lower than the prevailing wholesale price. locality. In the study the selling price of rice per bag of 50 kgs. has been set at ₱ 450.00 which is lower than the prevailing price of ₱ 465/bag.
- 4.3.4.3 Rice bran and other rice by-products will be sold to livestock producers in the area.
- 4.3.4.4 Delivery of rice will be free of charge within 40 km. distance. ~~Delivery fee will be charged~~ outside the 40 km. distance, to be based on current transport rate.
- 4.3.4.5 Sales will be cash on delivery (COD); however, credit sales can be arranged for regular costumers on case to case basis.

Chapter 5. ORGANIZATION AND MANAGEMENT

5.1 Project Organizational Structure

The project organizational structure is shown in Figure 1. The role and functions of the participating organizations could be delineated as follow:

5.1.1 Ilocos Norte Federation of Farmers Cooperatives (INFFCI)

Role: Project/Fund Manager

Functions:

- a) Exercises overall management, supervision, control and monitoring over the different aspects of project implementation;
- b) Taps the services of CRBIN, FAs/FCs, SFDC and other gov't/private support organizations to help implement the project;
- c) Acts as distributor of farm inputs;
- d) Undertakes palay procurement and processing, as well as rice trading;
- e) Acts as collector for payment of production loans and for capital build-up formation;

5.1.2 Cooperative Rural Bank of Ilocos Norte (CRBIN)

Role: Financial Conduit

Functions:

- a) Acts as depository bank for project fund;
- b) Acts as sub-grantee for the production loan component of the foreign funding support for the project;
- c) Negotiates for the release of LBP funding counterpart for the production loan component;
- d) Processes, evaluates and approves FAs/FCs' production loan application;

5.1.3 Farmers Associations/Cooperatives (FAs/FCs)

Role: Project implementor at barangay level

Functions:

- a) Intermediary conduit of production loan assistance to member-borrowers;
- b) Undertakes farm input dealership;
- c) Supervises and monitors member-beneficiaries' production activities;
- d) Collects members' marketable surplus for sale to INFFCI;

5.1.4 Farmer-Beneficiaries

Role: Palay Producer

Functions:

- a) Undertakes palay production activities;
- b) Sells marketable surplus to INFFCI;
- c) Undertakes capital build-up formation;

5.1.5 Small Farmers Development Center (SFDC)

Role: Project Consultant

Functions:

- a) Provides management-consultancy services to INFFCI on the different aspects of project operations;
- b) Acts as sub-grantee for the foreign funding support related to institutional development component of the project;
- c) Implements the project's institutional development program;

5.1.6 Other Gov't/Private Organizations

Role: Possible sources of project resources

Functions:

- a) Provides technical/financial support to the project;

5.2 INFFCI's Management Structure (See Figure 2)

5.2.1 Board of Directors (BOD)

- a) The Board of Directors shall act as the policy and highest decision-making body.
- b) The Chairman/President shall see to the implementation of policies and decisions passed by the BOD.
- c) The Auditor shall be directly responsible to the BOD.

5.2.2 Committees

The BOD shall be assisted by three (3) committees in the performance of its functions, to wit:

a) Palay Processing Committee

- recommends policy guidelines related to palay processing operations;
- undertakes periodic review/evaluation of the palay processing operations;

b) Marketing Committee

- recommends policy guidelines related to the project's marketing operations;
- undertakes periodic review/evaluation of the project's marketing operations;

c) Audit and Inventory Committee

- undertakes periodic cash count and physical inventory of INFFCI's assets;
- recommends policy guidelines based on audit results;

5.2.3 Operational Units

There are four (4) operational units, the main functions of which are as follow:

a) Office of Managing Director

- Overall Management & Supervision
- Planning & Coordination
- Monitoring & Evaluation

b) Processing Division

- Warehousing
- Drying
- Milling

c) Marketing Division

- Palay/Farm Input Procurement
- Trucking
- Trading on Farm Inputs
- Rice Trading

d) Admin. & Finance Division

- Administration
- Accounting

5.3 INFFCI's Staff Complement

a) Managing Director (1)

- Member of the Board
- Manages, controls, supervises and monitors the different project operations

b) Assistant Managers (2)

- Asst. Mgr. for Processing assists the Managing Director in managing the different operations related to processing, such as, warehousing, drying and milling;
- Asst. Mgr. for Marketing assists the Managing Director in managing the different operations related to marketing, such as, procurement of raw materials, marketing of finished products, and trucking services;

c) Admin./Finance Officer (1)

- Assists the Managing Director in managing the operations related to administration and accounting;

d) Accountant/Bookkeeper (1)

- Performs the accounting and bookkeeping functions;

e) Admin. Assistant (1)

- Performs the administrative functions;

f) Marketing Supervisors (2)

- Mktg Supervisor (Rice Trading) manages the palay procurement and rice trading operations;
- Mktg Supervisor (Farm Inputs) manages the procurement and trading on farm inputs;

g) Drying/Milling Operator (1)

- Takes care of the operation and maintenance of the mechanical dryer and ricemill;

h) Warehouseman (1)

- Sees to the safekeeping and maintenance of properties/stock inventory;

i) Clerk/typist (1)

- Performs the typing and clerical functions;

j) Security Guard (1)

- Takes care of the security of the premises;

k) Drivers (3)

- Handles the operation and maintenance of the vehicles;

l) Helpers (6)

- Acts as utilityman;

5.4 Hiring Criteria

5.4.1 The Managing Director will be chosen from among the Board of Directors. The one most qualified will be chosen.

5.4.2 Other key staff/personnel will be hired based on their qualification to perform the functions of the position to be filled up. Preference will be given to local hiring, particularly those belonging to the peasant sector.

5.4.3 Management and technical skills development training (refer to Schedule 9) will be provided to build up management and technical capability of the staff. This will be in the form of formal training to be followed up with on-the-job training. SFDC shall be mainly responsible for providing such trainings.

Chapter 6. FINANCIAL ASPECTS

6.1 Major Assumptions

- 6.1.1 Foreign funding shall be extended as grant.
- 6.1.1.2 LBF to release its 35% contribution to the production loan fund prior to start of project implementation.
- 6.1.1.3 CRBIN's counterpart to INFFCI's procurement fund to be given as loan at 12% interest rate p.a., payable in 3 years.
- 6.1.1.4 Outstanding loans from ACPC and CRBIN to be restructured at 12% interest rate p.a., payable in 5 years.
- 6.1.1.4 There will be fresh infusion of capital from old and new members of INFFCI, which will be used as INFFCI's counterpart in the initial working capital.
- 6.1.1.5 Palay production lending to be undertaken by CRBIN and institutional development activities by SFDC, hence not incorporated in INFFCI's financial statements, except for INFFCI's share in interest income.
- 6.1.1.6 All payables and receivables are assumed settled by the end of the year, hence the items do not appear in the balance sheet.
- 6.1.1.7 At each turn-over 10% of the procured palay are to be retained as stock inventory reserve; however, all stock inventory are to be disposed at the end of each production cycle, hence no inventory account appears in the financial statement.
- 6.1.1.8 Inflation was not considered in the preparation of the financial statements, since it has more or less the same effect on income and expenditure.
- 6.1.1.9 Due to the fact that the federation exists primarily for service and secondarily for profit, its buying price for palay will be at least ₱ 1.00/kgm. higher than the prevailing market price to approximate government support price; selling price of rice will at least be ₱ 0.50/kgm. lower than the prevailing market price.
- 6.1.1.10 Specific assumptions are incorporated in the financial tables and supporting schedules.

6.2 Total Project Cost

To establish the project, a total amount of ₱ 28.9 million or \$ 1.03 million at an exchange rate of ₱ 28.00 : \$ 1.00 will be needed (See Exhibit 1). The bulk of the amount will go finance the palay production activities of the farmers covering 1,200 has. (41%) and to the acquisition of fixed assets (36%). The rests will be used to finance the initial working capital (17%) and the institutional development activities (5%).

6.3 Sources of Financing

6.3.1 The bulk of the financing shall come from foreign funding ₱ 17.036 million (\$ 608,400) which is being requested to be provided as grant to INFFCI. This constitutes 59% of the total project cost.

6.3.2 The rests will be provided through local counterpart funding. The combined equity of INFFCI/FCs/Farmers amounts to 30% (₱ 8.63 million or \$ 308,000).

6.3.3 The rests of the financing will come from CRBIN (5%) and Land Bank of the Philippines (7%).

6.3.4 Foreign funding shall be used mainly to finance the acquisition of fixed assets (52%). It will also be used to finance a bigger portion of the working capital requirement. Around 24% will be allocated for this. Another 16% will be used to finance half of the production loan requirement. The remaining 7% will go to institutional development activities and management consultancy services.

6.4 Financial Analyses

6.4.1 A 5-year projected income statement shows the operations of the project to be profitable. The annual net income ranges from ₱ 1.7 M in the first year to ₱ 2.8 M in the fifth year. Test of profitability moreover shows the following results:

Gross Profit Margin	=	12%
Net Profit Margin	=	5%
Return on Investment	=	11%

6.4.2 A 5-year projected cashflow statement likewise shows that INFFCI will not encounter liquidity problem. There is no problem in meeting short-term obligations. Moreover, test of debt service shows the following results:

Debt to service ratio	=	4%
Total Capitalization ratio	=	4%

6.4.3 Breakeven analyses show the following results:

BEV : 1,697 mt.
 BESF : ₱ 7,964.80/mt.
 BES : ₱ 33.117 million

The breakeven volume is computed as 59% lower, breakeven selling price 12% lower, and breakeven sales, 3% lower than what has been projected.

6.4.4 The Internal Rate of Return (IRR) as presented in Exhibit 5 is computed at 15.6%, which is higher than the interest rate for agricultural loan which on the average is 12% p.a.

6.4.5 The Benefit Cost Ratio (BCR) is computed at 1.7, using a discount factor of 12%.

6.4.6 The Net Present Value (NPV), using a discount factor of 12% is computed at ₱ 26.7 M over a 10-year period.

6.4.7 Payback Period is 3.7 years. This means that the initial investment will be fully recovered after 3 years and 8 months.

PROJECT IMPLEMENTATION SCHEDULE

ACTIVITIES	1 9 9 1						
	A	M	J	J	A	S	O
1. PRESENTATION OF PROJECT PROPOSAL	█						
2. APPROVAL FOR FUNDING		█					
3. TRAINING SEMINAR FOR PARTICIPATING FO/FCS			█				
4. FO/FCS RICE LOAN APPLICATION	█						
5. EVALUATION / APPROVAL		█					
6. WAREHOUSE CONSTRUCTION			█	█	█		
7. MILL & DRYER INSTALLATION					█	█	
8. ELECTRICAL & WATER WORKS				█	█		
9. OTHER EQUIPMENTS					█	█	
10. TEST RUN							█

TOTAL LENGTH 8 MONTHS

Chapter 7. BUDGET

7.1 Budgetary Requirement

The total budgetary requirement for establishing the project is presented in Exhibit 1. It is broken down as follow:

Items	(in Thousand)	
	Pesos	US \$
1. Palay Production	11,892.0	424.7
2. Initial Working Capital	4,888.3	174.6
3. Fixed Assets	10,383.0	370.8
4. Institutional Devlopment	1,461.0	52.2
5. Mgt. Consultancy	300.0	10.7
Total	28,929.3	1,033.0

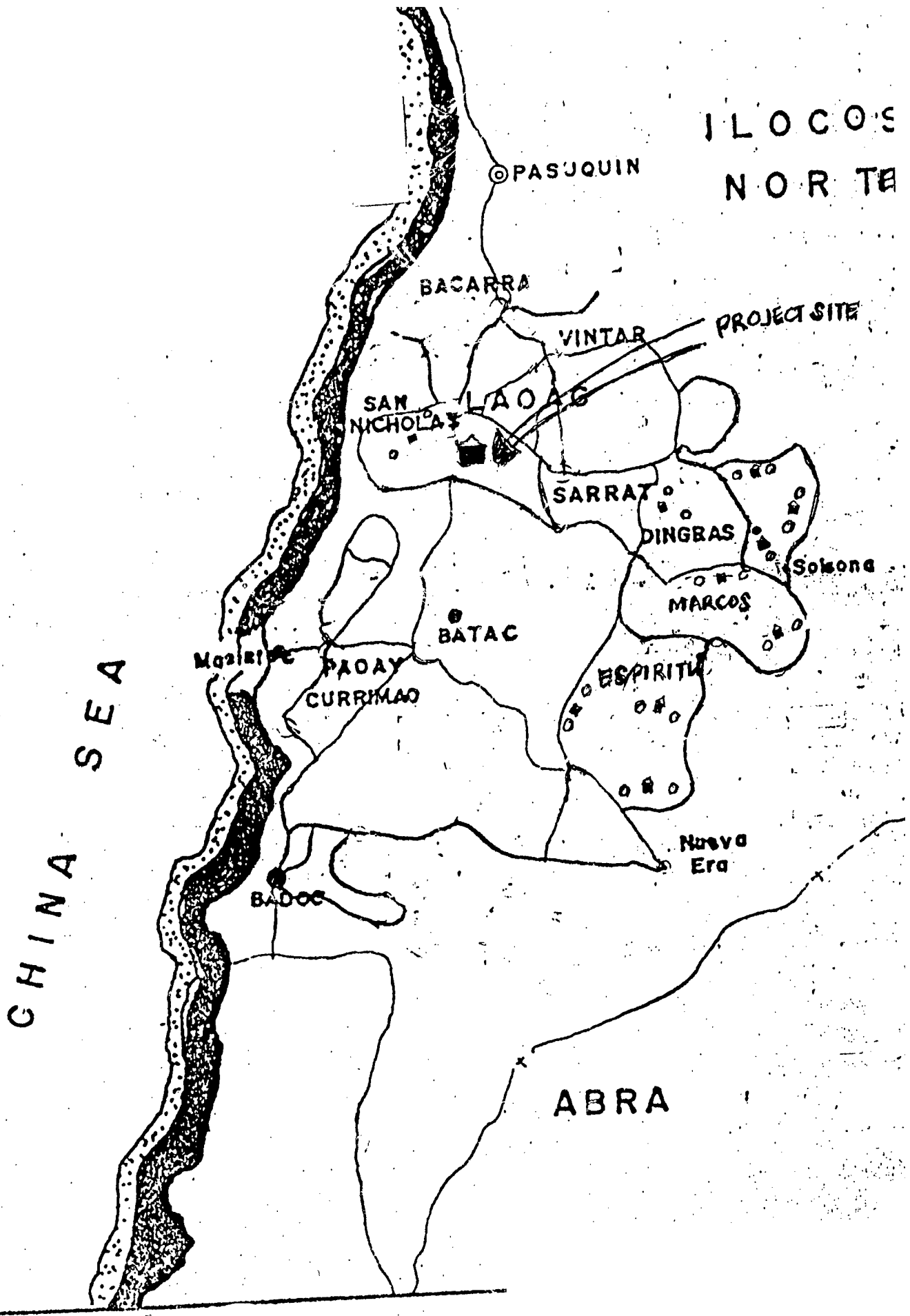
7.2 Foreign funding in the amount of P 17.04 M (\$ 608,430) will be needed to implement the project.

Chapter 8. RECOMMENDATIONS

- 8.1 The project is favorably recommended for it could produce the following benefits:
- 8.1.1 The project could double the income of the farmers through higher production, lower cost of credit and higher price of palay (See Table 13). Moreover, the project could enable the farmers to share in the benefits of rice milling and marketing through INFFCI's declaration of 50% of its net income as dividend/patronage refund. This further increases the farmers' income.
 - 8.1.2 The project could also benefit the landless farm workers by being employed more fully not only in the farm, but also in the processing and marketing operations of the project.
 - 8.1.3 The project could institutionally and economically strengthen the participating farmers organizations through continuous trainings/education and greater economic activities.
 - 8.1.4 The project gradually transfers the control of the rice farm business in the area in the hand of the farmers—the primary—producers. This will enable the peasant sector to eventually achieve economic take-off and improve their conditions in life.
 - 8.1.5 The project will help the farmers gradually achieve self-reliance, particularly with the implementation of capital build-up formation.
 - 8.1.6 The project could also help promote the growth of the economy by contributing to the attainment of rice self-sufficiency and reducing rice importation.
- 8.2 The project is favorably recommended for it is viable from the market, technical, management and financial points of view.
- 8.3 The organized farmers lack the management expertise to effectively and efficiently implement the project. Hence, it needs the services of project consultant. The role of SFDC is therefore really important. SFDC, having the expertise should also be made to handle the institutional development component of the project.

8.4 CRBIN is a farmers-owned and managed cooperative bank with good track record in lending operations. Hence, INFCCI should tap CRBIN's lending facilities rather than set up its own credit program.

8.5 Development is more effective if done in partnership between the government and the private sectors. The project must hence tap the resources of the government and other private organizations, and the government must try to extend the needed support, particularly in providing loan assistance, market assistance and extension workers.



LEGEND:
 [House Icon] - CENTRAL WAREHOUSE / PROJECT SITE
 [Dot Icon] - REFILLITE WAREHOUSE

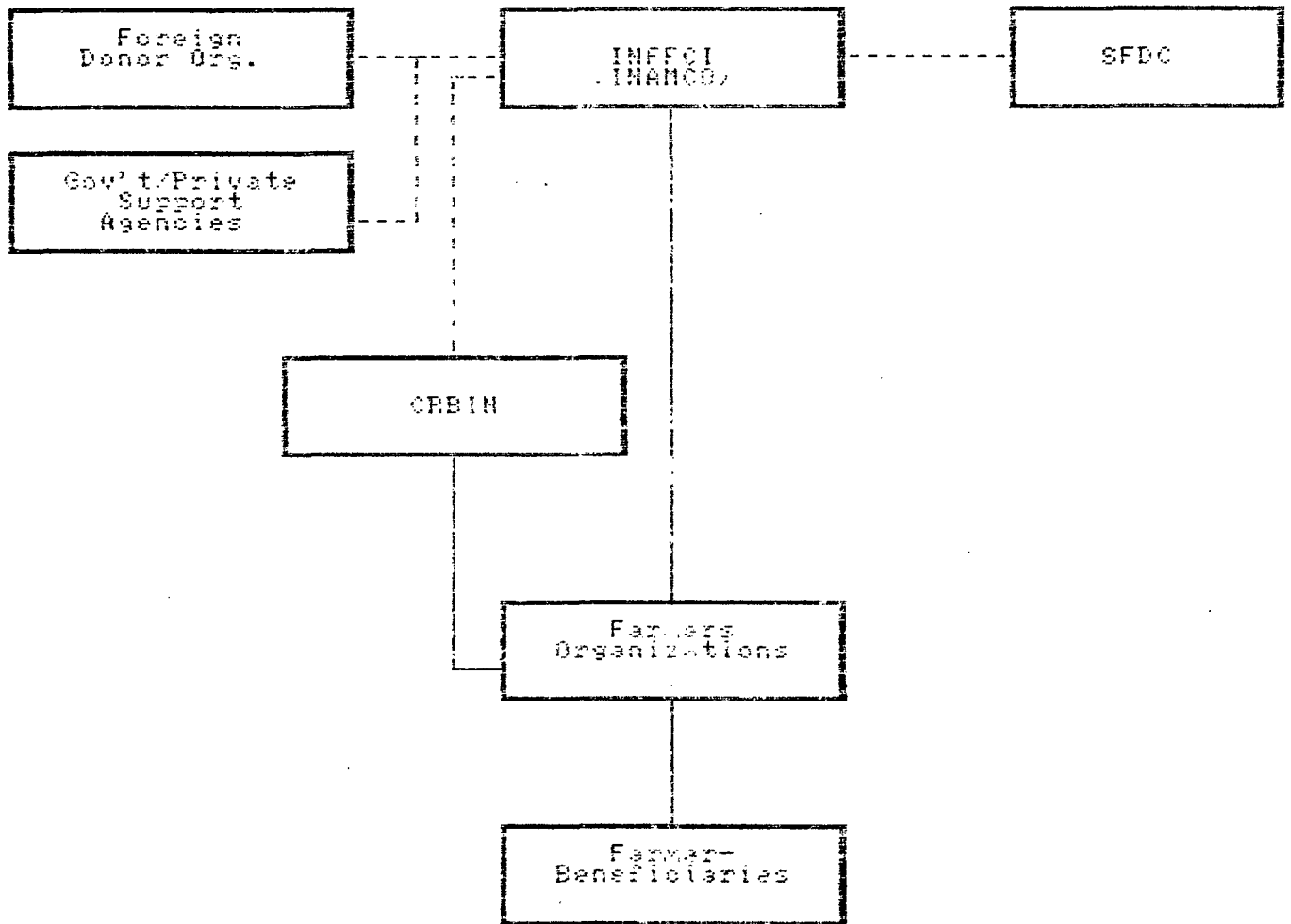
Appendix A

LIST OF PARTICIPATING FCs

Cluster #	Name of FA/FC	Address	MPW Location	Date Registered
1	San Cecilia Multi-purpose Coop San Guillermo SN, Inc.	Brgy. Sta. Cecilia, San Nicolas Brgy. San Guillermo, San Nicolas	x	
2	Saludares SN, Inc. Nagmarcaan Farmers SN, Inc.	Brgy. Saludares, Dingras Brgy. Nagmarcaan, Dingras	x	10-24-73 2-20-75
3	Macayepyep SN, Inc. Binacag SN, Inc.	Brgy. Macayepyep, Espiritu Brgy. Binacag, Espiritu	x	3-19-74
4	Bangsar SN, Inc. SN ng Imelda, Inc.	Brgy. Bangsar, Espiritu Brgy. Imelda, Espiritu	x	10-26-73 3-19-74
5	New Bugasi SN, Inc. Sinamar SN, Inc.	Brgy. Bugasi, Espiritu Brgy. Sinamar, Espiritu	x	10-26-73 12-26-73
6	Daquioag SN, Inc. SN ng Lydia, Inc.	Brgy. Daquioag, Marcos Brgy. Lydia, Marcos	x	1-28-75 1-31-73
7	Escoda Multipurpose Coop, Inc. Agunit SN, Inc.	Brgy. Escoda, Marcos Brgy. Agunit, Marcos	x	7-22-73
8	Bagbag SN, Inc. San Juan SN, Inc.	Brgy. Bagbag, Solsona Brgy. San Juan, Solsona	x	11-29-74 8-18-73
9	Talugtug SN, Inc. Manalpac SN, Inc.	Brgy. Talugtug, Solsona Brgy. Manalpac, Solsona	x	8-18-73 11-29-74
10	San Julian SN, Inc. Nalasin SN, Inc.	Brgy. San Julian, Solsona Brgy. Nalasin, Solsona	x	8-12-73 8-1-73

Note: a) Farm area covered per FO is 60 hectares
 b) 80 farmer-beneficiaries per FO
 c) Average farm area per farmer-beneficiary is 0.75 hectare

Figure 1. PROJECT ORGANIZATIONAL STRUCTURE



- Legend:
- INFCCI - Ilocos Norte Federation of Farmers Cooperatives, Inc.
 - SFDC - Small Farmers Development Center, Inc.
 - CRBIN - Cooperative Rural Bank of Ilocos Norte, Inc.

Figure 2. PROJECT MANAGEMENT STRUCTURE

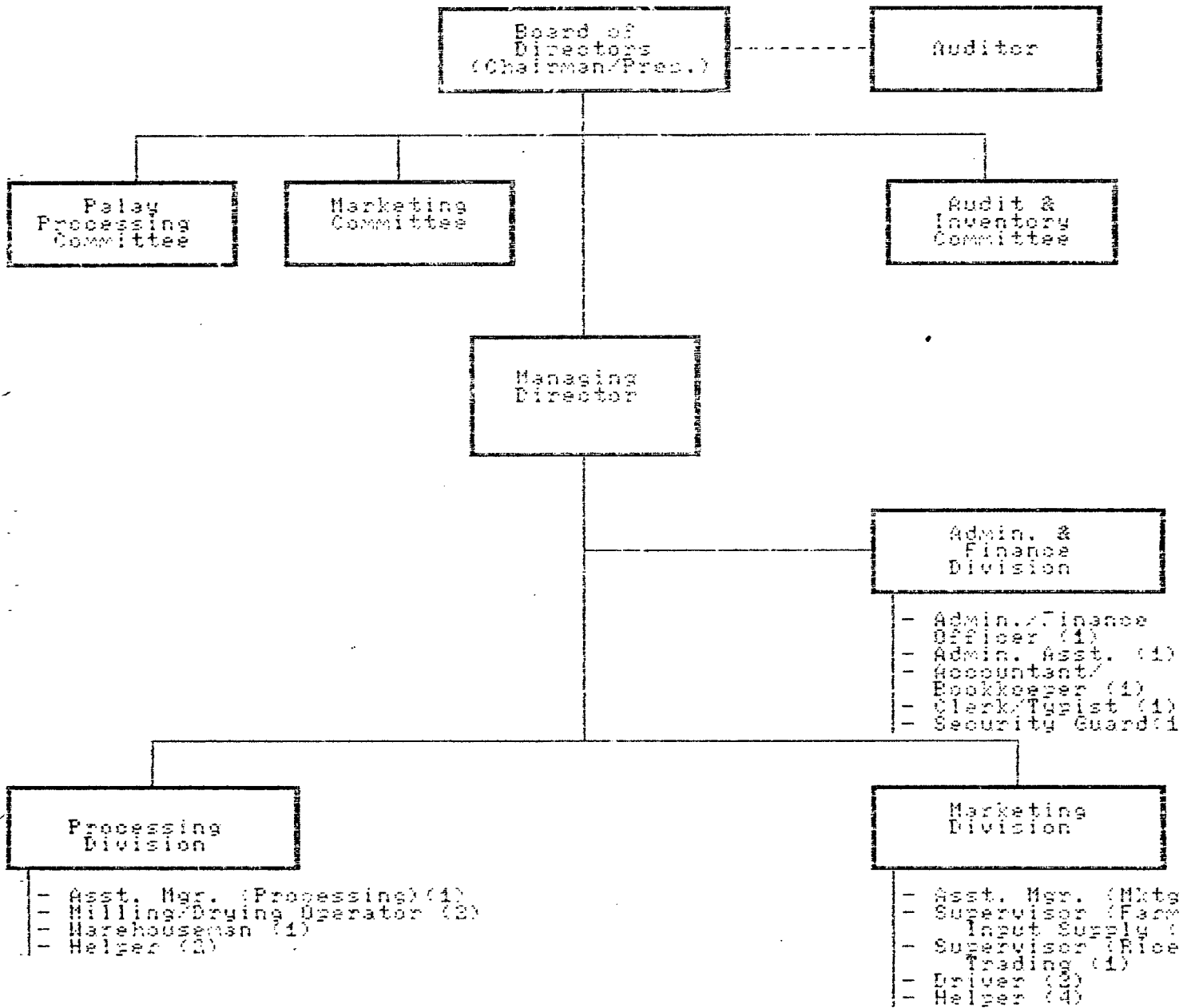


Exhibit 1

TOTAL PROJECT COST AND SOURCES OF FINANCING
(P '000)

Particulars	Budget Required:		Sources of Financing				
	Amount	Percent	Foreign Funding:		Local Counterpart		
			Amount	Percent	Gov't (LBP)	CRBIN	INFFCI/FDs/ Farmers
1. Palay Production	11,892.0	41%	2,700.0	16%	1,890.0	810.0	6,492.0
2. Initial Working Capital							
a) Palay Procurement	3,355.2	12%	2,851.9	17%		503.3	
b) Other Variable Expenses	674.6	2%	573.4	3%			101.2
c) Salaries and Benefits	489.9	2%	416.4	2%			73.5
d) Administrative Expenses	368.6	1%	313.3	2%			55.3
3. Fixed Assets	10,363.0	36%	8,908.0	52%			1,425.0
4. Institutional Development							
a) Trainings	1,221.0	4%	733.0	4%			488.0
b) Institution Building	240.0	1%	240.0	1%			
5. Mgt. Consultancy Fee	300.0	1%	300.0	2%			
Total (Peso)	28,924.3	100%	17,036.0	100%	1,890.0	1,313.3	8,635.0
Percentage	100%		59%		7%	5%	30%
Total (\$)	1,033.0		608.4		67.5	46.9	308.4

Assumptions:

- FOs/Farmers' equity in palay production requirement is in terms of labor input (See Schedule 12); the rests will be financed through production loan sourced as follow:
 - Foreign funding : 50%
 - LBP : 35%
 - CRBIN : 15%
- Initial palay procurement fund as presented in Schedule 11, sourced as follow:
 - Foreign funding : 85%
 - CRBIN : 15%
- Initial working capital for other items is for a 6-month period;
- Cost on institution building is P 12,000.00 per FD, or P 1,000.00 monthly;
- Mgt. consultancy fee is for a period of one year;
- Exchange rate is P 28.00 : \$ 1.00

Exhibit 2

PROJECTED INCOME STATEMENT
(P '000)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
SALES					
Clean Rice	31,590.0	33,169.5	34,828.0	36,569.4	38,397.8
Rice Bran	2,592.0	2,721.6	2,857.7	3,000.6	3,150.6
Total Sales	34,182.0	35,891.1	37,685.7	39,569.9	41,548.4
Less: COST OF SALES					
Raw Materials (Wet Palay)	28,800.0	30,240.0	31,752.0	33,339.6	35,006.6
Supplies & Materials	624.0	655.2	688.0	722.4	758.5
Direct Labor	120.0	126.0	132.3	138.9	145.9
Power Consumption	538.2	565.1	593.4	623.0	654.2
Fuel & Lubricant	67.0	70.4	73.9	77.6	81.4
Total Cost of Sales	30,149.2	31,656.7	33,239.5	34,901.5	36,646.5
GROSS PROFIT MARGIN	4,032.8	4,234.4	4,446.2	4,668.5	4,901.9
Less: OPERATING EXPENSES					
Salaries and Benefits	979.8	979.8	979.8	979.8	979.8
Administrative Expenses	737.2	737.2	737.2	737.2	737.2
Depreciation	846.6	846.6	846.6	846.6	846.6
Mgt. Consultancy Fee	300.0	300.0	300.0	300.0	300.0
Interest Expense	104.8	81.0	48.6	19.3	8.7
Total Operating Expenses	2,968.4	2,944.6	2,912.1	2,882.8	2,872.3
NET INCOME	1,064.4	1,289.8	1,534.0	1,785.6	2,029.6
Add: OTHER INCOME					
Trade Discount	308.6	324.1	340.3	357.3	375.2
Interest Income	324.0	340.2	357.2	375.1	393.8
Total Other Income	632.6	664.3	697.5	732.4	769.0
ADJUSTED NET INCOME	1,697.0	1,954.1	2,231.5	2,518.0	2,798.6

Assumptions:

- Trade discount is 5% of cost of farm inputs
- Interest income is INFFCI's share in CRBIN's interest income, equivalent to 3% of prod. loan
- Selling price of rice is P 9,000/mt. and for rice bran, P 4,000/mt.
- Buying price of fresh palay is P 4,800/mt.

Exhibit 3

PROJECTED CASHFLOW STATEMENT
(P '000)

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
INFLOW						
Foreign Grant	13,363.0					
CRBIN Procurement Loan	503.3					
Outstanding Loan	385.0					
Counterpart	1,655.0					
Sales		34,182.0	35,891.1	37,685.7	39,569.9	41,548.4
Other Income		632.6	654.3	697.5	732.4	769.0
Capital Share Contribution		288	302.4	317.52	333.396	350.0658
Total Inflow	15,906.2	35,102.6	36,857.8	38,700.7	40,635.7	42,667.5
OUTFLOW						
Fixed Assets' Acquisition	10,383.0					
Cost of Sales		30,149.2	31,656.7	33,239.5	34,901.5	36,646.5
Salaries and Benefits		979.8	979.8	979.8	979.8	979.8
Administrative Expenses		737.2	737.2	737.2	737.2	737.2
Mgt. Consultancy Fee		300.0	300.0	300.0	300.0	300.0
Loan Amortization		254.3	343.6	343.6	104.6	104.6
Total Outflow	10,383.0	32,420.5	34,017.2	35,600.0	37,023.0	38,768.1
NET INFLOW (OUTFLOW)	5,523.2	2,682.2	2,840.6	3,100.6	3,612.6	3,899.4
CASH BALANCE, BEG.		5,523.2	8,205.4	11,046.0	14,146.6	17,759.2
CASH BALANCE, END.	5,523.2	8,205.4	11,046.0	14,146.6	17,759.2	21,658.6

Assumptions:

- Foreign funding as in Exhibit 1 less amount for palay production loan and inst. dev., which will go to CRBIN and SFDC;
- Counterpart as provided by INFFCI/FDs/farmers in Exhibit 1 less the amount for palay production and institutional development;
- Capital build-up per farmer-beneficiary is P 240/ha., of which 50% is deposited by the FDs as additional share capital in INFFCI; increase of 5% yearly;

Exhibit 4

PROJECTED BALANCE SHEET
(P '000)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS					
Current Assets					
Cash	8,205.4	11,046.0	14,146.6	17,759.2	21,658.6
Total Current Assets	8,205.4	11,046.0	14,146.6	17,759.2	21,658.6
Fixed Assets					
Land	425.0	425.0	425.0	425.0	425.0
Building	4,000.0	4,000.0	4,000.0	4,000.0	4,000.0
Equipment	5,958.0	5,958.0	5,958.0	5,958.0	5,958.0
Total Cost of Fixed Assets	10,383.0	10,383.0	10,383.0	10,383.0	10,383.0
Less: Accumulated depreciation	846.6	1,693.2	2,539.8	3,386.4	4,233.0
Total Fixed Assets, Net	9,536.4	8,689.8	7,843.2	6,996.6	6,150.0
Total Assets	17,741.8	19,735.8	21,989.8	24,755.8	27,808.6
LIABILITIES & CAPITAL					
Long-Term Liabilities					
CRBIN Procurement Loan	414.0	219.0			
ACPC/CRBIN Outstanding Loan	324.8	257.2	181.3	95.9	
Total Long-Term Liabilities	738.8	476.3	181.3	95.9	
Capital					
Equity	1,655.0	1,655.0	1,655.0	1,655.0	1,655.0
Additional Share Capital	288.0	590.4	907.9	1,241.3	1,591.4
Donated Capital	13,363.0	13,363.0	13,363.0	13,363.0	13,363.0
Retained Earnings	1,697.0	3,651.1	5,882.6	8,400.6	11,199.2
Total Equities	17,003.0	19,259.5	21,808.6	24,659.9	27,808.6
Total Liabilities & Equity	17,741.8	19,735.8	21,989.8	24,755.9	27,808.6

IRR Calculation

Year	Initial Investment	Net Cash Flow	DF at 15%	Present Value	DF at 15%	Present Value	DF at 15%	Present Value
0	15,571.3	5,571.3		5,571.3		5,571.3		5,571.3
1		2,557.3	0.8696	2,223.9	0.7561	1,930.5	0.6575	1,685.0
2		2,540.8	0.7561	1,920.8	0.6575	1,664.0	0.5678	1,431.0
3		2,420.8	0.6575	1,591.0	0.5678	1,371.1	0.4868	1,173.1
4		2,310.8	0.5678	1,303.8	0.4868	1,117.7	0.4137	957.1
5		2,199.4	0.4868	1,061.8	0.4137	894.9	0.3476	764.8
6		2,087.4	0.4137	864.8	0.3476	717.9	0.2887	601.0
7		1,974.4	0.3476	685.8	0.2887	560.2	0.2366	461.7
8		1,860.8	0.2887	537.0	0.1911	354.9	0.1911	354.9
9		1,746.8	0.1911	333.0				
10		1,632.8	0.1626	266.0				
Total	15,571.3	16,551.3		11,450.0		6,453.5		11,570.5

Interpolation: Lowest rate + absolute differences $\frac{(\text{High PV} - \text{Project Cost})}{(\text{High PV} - \text{Low PV})}$

$$15 + 3 \left(\frac{16,485.5 - 15,571.3}{16,485.5 - 11,570.5} \right)$$

$$15 + 3 \left(\frac{914.2}{4,915} \right)$$

$$15 + 3 (.19)$$

$$15 + .57$$

$$\text{IRR} = 15.57$$

Schedule 1

FIXED ASSETS

Items	Quantity	Area/Capacity	Equity	Funding	Total
Land & land Dev't					
Central Warehouse	1	3,000 sqms.	700,000		300,000
Satellite Warehouses	10	500 sqms./unit	125,000		125,000
Warehouses					
Central Warehouse	1	24,000 bags capacity	1,000,000	1,500,000	2,500,000
Satellite Warehouses	10	500 bags capacity		1,500,000	1,500,000
Ricemill (Multi-pass)	1	3 MT capacity/hr(input)		1,500,000	1,500,000
Mechanical Silo Dryer	1	40 MT capacity/day		2,350,000	2,350,000
Delivery Vehicles					
Truck	1	10 tons capacity		800,000	800,000
Truck	1	5 tons capacity		400,000	400,000
Service Vehicles					
AUV (Light pick-up)	1	2.5 tons capacity		300,000	300,000
Motorcycle	4	120 cc		160,000	160,000
Accessories					
Weighing Scale	12	500 bags capacity		96,000	96,000
Moisture Tester	12			72,000	72,000
Bag Closing Machine	2			30,000	30,000
Office & Communication Eq't					
Computer w/ printer	2	PC compatible		100,000	100,000
Radio communication set	1	Single sideband		100,000	100,000
Office Furnitures			50,000		50,000
Total			1,475,000	8,908,000	10,383,000

Schedule 2

PROCUREMENT, DRYING & MILLING RECOVERY
(in metric tons)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
A) Procurement	6,000	6,300	6,615	6,946	7,293
Less : Shrinkage (10%)	600	630	662	695	729
Net Dry Weight	5,400	5,670	5,954	6,251	6,564
B) Milling Recovery					
Clean Rice (65%)	3,510	3,686	3,870	4,063	4,266
Rice Bran (12%)	648	680	714	750	788
Rice Hull (23%)	1,242	1,304	1,369	1,438	1,510

Assumptions :

- a) First year palay procurement is computed based on:
Procurement/ha.: 2.5 mt
Area covered/cropping : 1,200 hectares
No. of croppings per year: 2
- b) Palay procurement volume is to increase by 5% yearly
- c) Moisture content of dried palay is 14%
- d) percentages in milling recovery refer to net dry weight
- e) Fresh palay is procured at 16-20% moisture content

Schedule 3

VARIABLE COST
(Year 1)

Particulars	Amount
Raw Materials (Palay)	28,800,000
Direct labor	120,000
Supplies & Materials	624,000
Power Consumption	538,200
Fuel Consumption	67,000
TOTAL	30,149,200

Assumptions:

- Palay procurement : 6,000 mt, at P 4,800/mt
- Supplies & material :
 - a) Sack : 120,000 pcs. at P 4/pc
 - b) Rubber roll : 240 sets at P 600/set; rubber roll replacement needed every 0.5 mt
- Power Consumption :
 - a) Rice mill : 75 kw, 10 hrs/day, 180 days, P 2.60/ kwh
 - b) Dryer : 40 kw, 12 hrs/day, 150 days, P 2.60/kwh
- Fuel Consumption :
 - a) 5-tonner truck - 100 km/day, 8 km/lit, P 10/lit, 180 days
 - b) 10-tonner truck - 150 kms/day, 6 km/lit, P 10/lit, 180 days
- Direct labor refers to handling cost from drying to milling, computed at P 1.00 per 50 kgm. bag

Schedule 4

FIXED COST
(Year 1)

Particulars	Amount
Salaries & Benefits	979,800
Administrative Expenses	737,180
Depreciation	846,600
Mgt. Consultancy Fee	300,000
Interest Expense	104,841
TOTAL	2,968,421

Schedule 5

ADMINISTRATIVE EXPENSES

(Year 1)

PARTICULARS	AMOUNT
Repair & Maintenance	298,740
Power Consumption	65,520
Fuel & Lubricants	125,760
Insurance	199,160
Supplies & Communication	24,000
Miscellaneous	24,000
TOTAL	737,180

Assumptions:

- Repair and Maintenance is 3% of fixed assets excluding land
- Insurance is 2% of fixed assets excluding land
- Power Consumption : 10 kw/hr, 10 hrs/day, 252 days, P 2.60/kwh
- Fuel Consumption :
 - a) AUV - 100 kms./day, 10 kms/lit., 240 days, P 10/lit., 1 unit
 - b) Motorcycle - 100 kms/day, 25 kms/l., 240 days, P 16.50/l., 4 units
- Supplies & communication is P 2,000 monthly; so is miscellaneous

Schedule 6

SALARIES & BENEFITS

Particulars	# Staff	Mo. Rate/Pers	Monthly	Annual
A. Salaries				
Managing Director	1	7,500	7,500	90,000
Auditor	1	5,000	5,000	60,000
Asst. Manager	2	5,000	10,000	120,000
Admin./Finance Officer	1	5,000	5,000	60,000
Accountant/Bookkeeper	1	3,500	3,500	42,000
Administrative Assistant	1	3,500	3,500	42,000
Marketing Supervisor	2	3,500	7,000	84,000
Milling/Drying Operator	2	2,500	5,000	60,000
Warehouseman	1	2,500	2,500	30,000
Driver	3	2,500	7,500	90,000
Helper	6	2,000	12,000	144,000
Security Guard	1	2,500	2,500	30,000
Sub-total	22		71,000	852,000
B. Employee Benefits (15% of salaries)			10,650	127,800
Total			81,650	979,800

Schedule 7

DEPRECIATION SCHEDULE

Equipment	Cost	Life	Depreciation
1. Land	425,000		
2. Warehouses	4,000,000	25	150,000
3. Ricemill	1,500,000	10	150,000
4. Mechanical Silo Dryer	2,335,000	10	235,000
5. Delivery Trucks	1,200,000	10	120,000
6. Service Vehicles	460,000	5	92,000
7. Accessories	198,000	5	39,600
8. Office & Comm. Eq't	200,000	5	40,000
9. Office Furnitures	50,000	5	10,000
Total	10,383,000		846,600

Schedule 8

AMORTIZATION SCHEDULE

A. CRBIN Procurement Loan

Given: Loan Amount: 503,280
 Interest Rate p.a.: 12%
 Mode of Payment: Semi-annual
 Repayment Period: 3 years
 Grace Period: 6 mos.

Payment	Amortization	Interest	Principal	Balance
0				503,280
1	30,197	30,197		503,280
2	119,477	30,197	89,280	414,000
3	119,477	24,840	94,637	319,363
4	119,477	19,162	100,315	219,048
5	119,477	13,143	106,334	112,714
6	119,477	6,763	112,714	0

B. ACPC/CRBIN Outstanding Loan

Given: Loan Amount: 385,000
 Interest Rate p.a.: 12%
 Mode of Payment: Semi-annual
 Repayment Period: 5 years

Payment	Amortization	Interest	Principal	Balance
0				385,000
1	52,309	23,100	29,209	355,791
2	52,309	21,347	30,962	324,829
3	52,309	19,496	32,819	292,010
4	52,309	17,521	34,789	257,221
5	52,309	15,433	36,876	220,345
6	52,309	13,221	39,088	181,257
7	52,309	10,875	41,434	139,823
8	52,309	8,389	43,920	95,903
9	52,309	5,754	46,555	49,348
10	52,309	2,961	49,348	0

Schedule 9

TRAINING AND SKILLS-DEVELOPMENT

Particulars	:Proj. Orient., :Basic Coop Course: :Value Formation :	:Leadership Dev.: :& Coop Mgt. :	Mgt. Skills : Development :	:Rice Process. :& Marketing : Technology :	:Improved Palay : : Production : : Technology :	: Total
1. Target	:Gen. membership :Project Staff :	:BOD Directors :& Key Staff :	:INFFCI Director: :Comm. Members, :& Key Staff :	: key Staff & :Comm. Members :	:Proj. Benef. & : Key Staff :	:
2. Duration	:5 days/batch	:3 days/batch	: 5 days	: 5 days	: 1 day	:
3. No. of batches	: 41	: 5	: 1	: 1	: 40	:
4. No. of Participants	: 1,630	: 150	: 30	: 20	: 1610	:
5. Type	: live-out	: live-in	: live-in	: live-in	: live-out	:
5. Budget	:	:	:	:	:	:
Food/Meals (P 50/day/part.)	: 407,500	: -	:	:	: 80,500	: 488,000
Board & Lodging (P 150/day/part.)	: -	: 67,500	: 22,500	: 15,000	: -	: 105,000
Supplies & materials (P 50/part.)	: 81,500	: 7,500	: 1,500	: 1,000	: 80,500	: 172,000
Resource Speakers (P 200/hr. for live-in, P 100/hr. for live-out)	: 164,000	: 24,000	: 8,000	: 8,000	: 32,000	: 236,000
Staff Support (P 2,500/batch)	: 102,500	: 12,500	: 2,500	: 2,500	: 100,000	: 220,000
Total Budget	: 753,500	: 111,500	: 34,500	: 26,500	: 293,000	: 1,221,000
6. Source of Funding	:	:	:	:	:	:
Foreign Funding	: 348,000	: 111,500	: 34,500	: 26,500	: 212,500	: 733,000
Counterpart (FDs/Farmers)	: 407,500	:	:	:	: 80,500	: 488,000

Schedule 10

MARKETABLE SURPLUS PER HECTARE
(in metric tons)

Particulars	Quantity
Gross Harvest	4.5
Less : Harvester/threshers Share	0.9
Reserve for Home Consumption	0.5
Lease rental/land amort. payment	0.6
Marketable Surplus	2.5

Assumptions :

- Ave. harvest per hectare is 90 cavans (4.5 metric tons)
- Harvester & Thresher Share is 20% of gross harvest
- Lease rental/land amortization is 12 cavans(0.6 mt)/cropping

Schedule 11

PROCUREMENT FUND REQUIREMENT

Particulars	Amount
A. Required Per Hectare	
Cost of Marketable Surplus (at P 4,800/mt)	12,000
Less: Production loan payment	4,500
Interest on Loan (6% for 180 days)	270
Capital Build-up	240
Procurement fund requirement	6,990
B. Required for 1,200 Hectares	8,388,000
C. Initial Procurement Fund Req't	
a) Initial Purchase (at 3 turn-overs per prod. cycle)	2,796,000
b) Stock Inventory Reserve (20% per turn-over)	559,200
Total	3,355,200

Schedule 12'

PRODUCTION REQUIREMENT PER HECTARE & SOURCES OF FINANCING

PARTICULARS	QTY.	EQUITY	LOAN	TOTAL
I. Labor Inputs				
Land Preparation	1 has.		1,810	1,810
Transplanting		820		820
Weeding/Cultivating		270		270
Harvesting/threshing (20% of harvest)		4,320		4,320
II. Material Inputs				
Seeds	1 bag	-	360	360
Fertilizers				
14-14-14	4 bags	-	952	952
16-20-0	2 bags	-	440	440
Chemicals				
Insecticide	2 qts.	-	500	500
Herbicide	250 grms.	-	320	320
Insurance				
PCIC (2% of loan)		-	88	88
CISP (P 6.75 for 6 mos. per P 1,000 loan)		-	30	30
TOTAL		5,410	4,500	9,910

Schedule 13

COMPARATIVE COST AND RETURN ANALYSIS PER HECTARE

	W/O Project	W/ Project
Production	4 mt	4.5 mt
Less: Harvester-Threshers' Share	0.8 mt	0.9 mt
Reserve for home consumption	0.5 mt	0.5 mt
Lease rental/land amort.	0.6 mt	0.6 mt
Marketable Surplus	2.1 mt	2.5 mt
Sales of Wet Palay	7,980	12,000
Less: Production Expenses		
Seeds	240	360
Fertilizers	1,392	1,392
Chemicals	820	820
Insurance		118
Interest Expense	1,207	270
Sub-Total	3,659	2,960
Net Cash Income	4,321	9,040
Percent Increase		109%

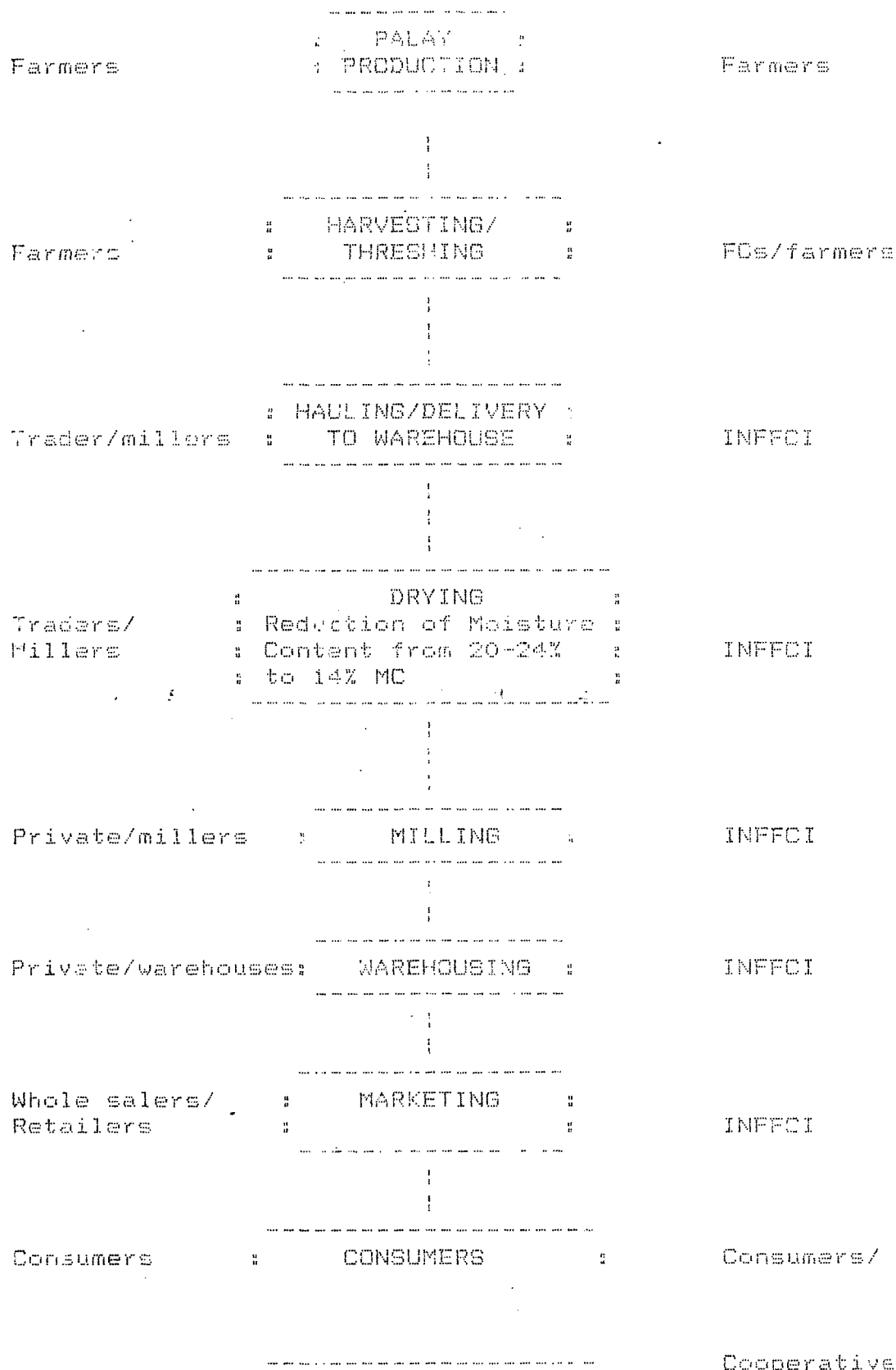
Assumptions:

- Increase in yield is projected due to use of improved palay technology
- Harvester-thresher's share is 20% of gross harvest
- Prevailing price for wet palay is P 3,888.00/mt; INFFCI will buy it from members at P 4,800.00/mt to conform with government buying price
- Higher cost of seeds in the project is due to use of certified seeds
- Interest rate charged by private money lenders ranges from 5% - 10% monthly

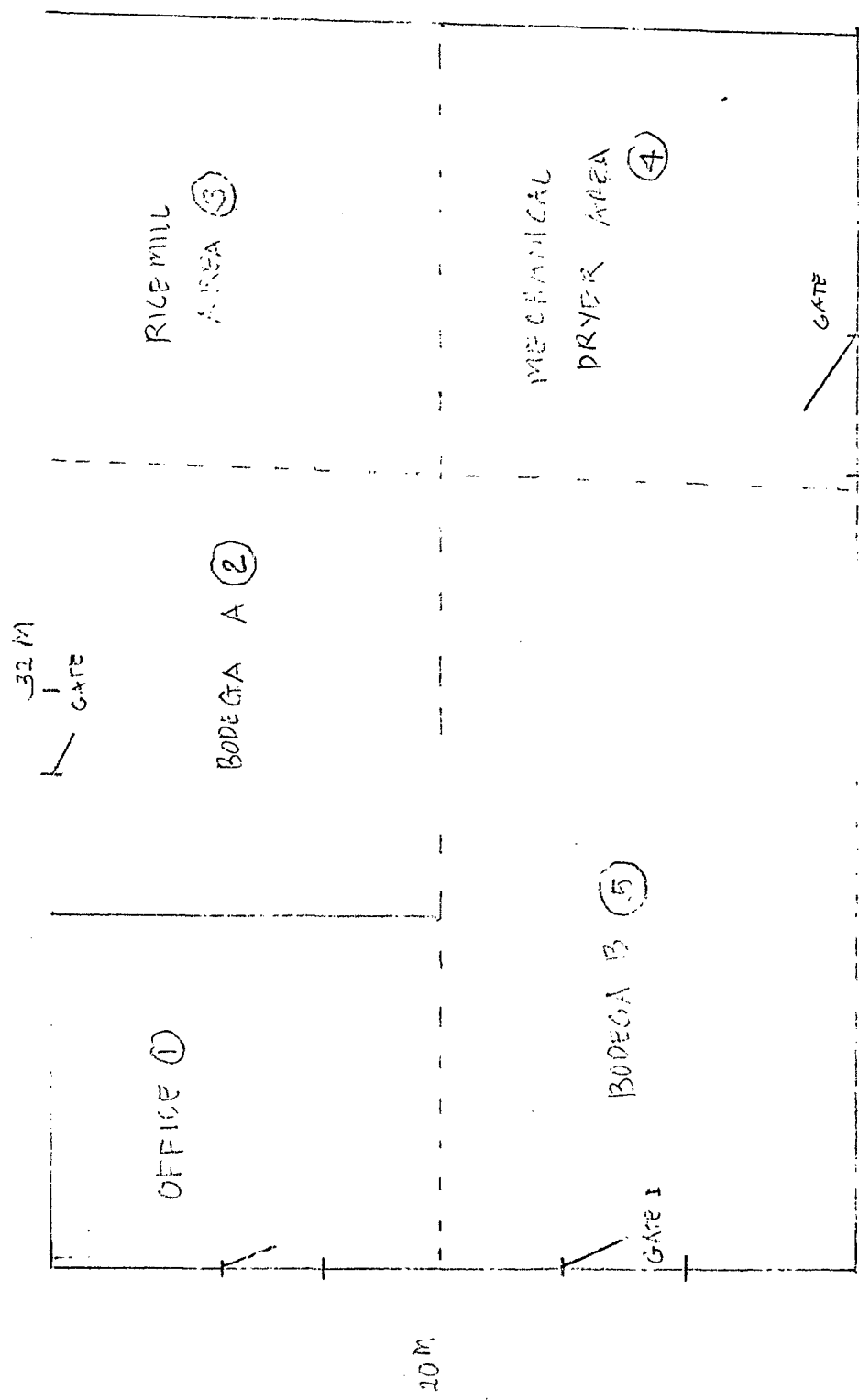
FLOW CHART-PALAY PRODUCTION-PROCESSING-MARKETING

Existing Practice

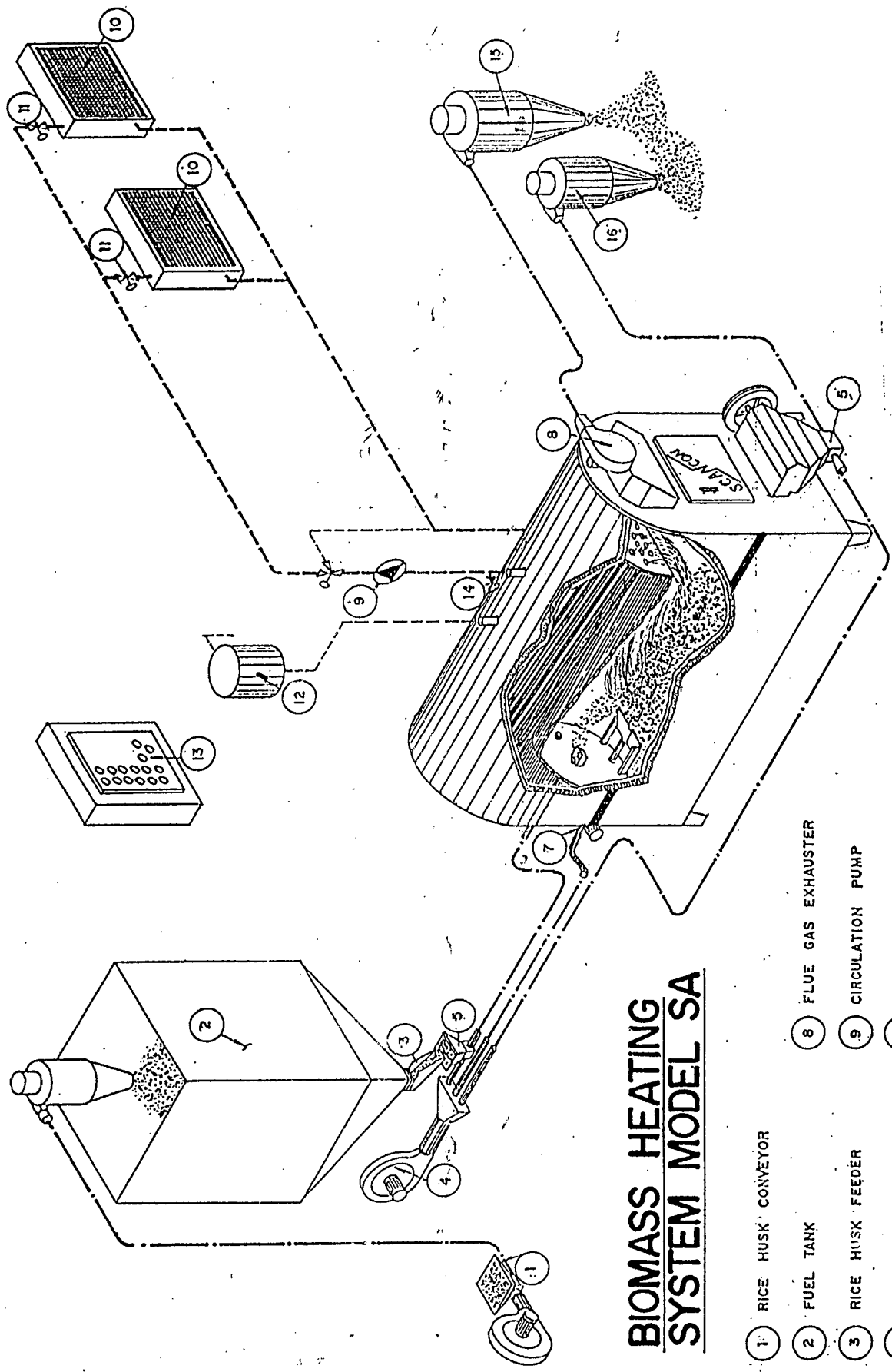
Cooperative System



PLANT LAY-OUT

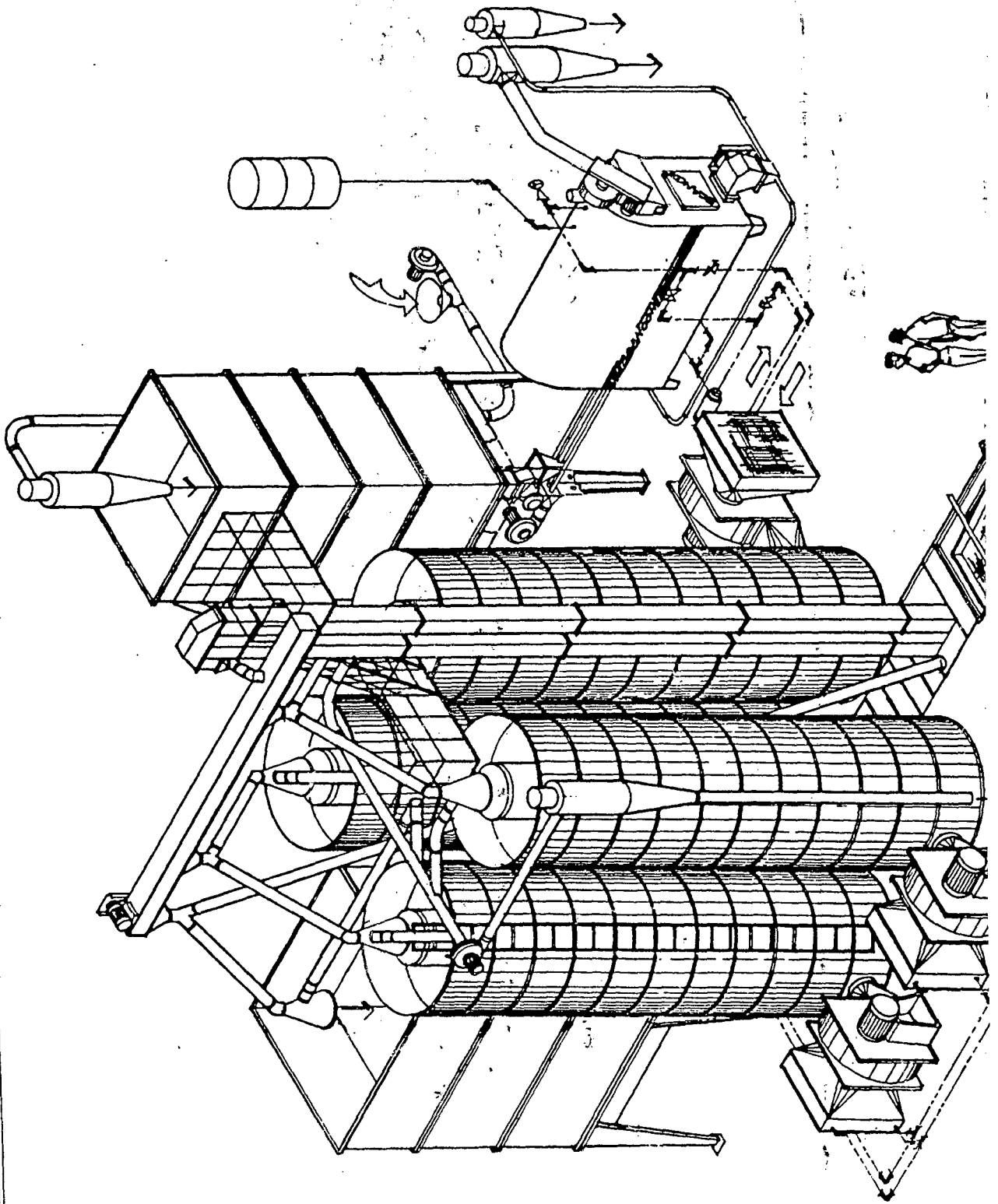


- LEGEND:
- ① 40 METER γ
 - ② BODEGA A - 60 M γ
 - ③ 60 M γ
 - ④ 60 M γ
 - ⑤ 14,280 CARAWA CNP



BIOMASS HEATING SYSTEM MODEL SA

- (1) RICE HUSK CONVEYOR
- (2) FUEL TANK
- (3) RICE HUSK FEEDER
- (4) BLOWER, FUEL INDICATOR
- (5) CIRCULATION PUMP
- (6) FLUE GAS EXHAUSTER
- (7) DOOR
- (8) FLUE GAS EXHAUSTER
- (9) CIRCULATION PUMP
- (10) HEAT EXCHANGERS



Fifth ICA/Japan Training Course for
Strengthening Management of
Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	Modernization of : Desiccated Coconut Factory.
<i>COUNTRY</i>	: Sri Lanka.
<i>PROJECT PREPARED BY</i>	: M.B.R.Perera.

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

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ACKNOWLEDGMENT

The fifth I.C.A / Japan Training course for strengthening management of agricultural co-operatives in Asia as from 22 nd October 1990 to 10th May 1991 is a unique opportunity for me to understand the concepts of integrated co-operative development systems, planning and management of co-operatives.

My 2 months stay in India with the fellow participants of the nine Asian countries gave us good opportunity to share our experiences on defferent aspects of agricultural co-operatives in South East Asia. Class room sessions and field study visits further enhanced our knowledge on co-operatives. This project on modernization of M.145 desiccated coconut factory has been prepared basing on the knowledge obtained by me under this programme

I make this opportunity to express my gratitude to the staff members of I.C.A. Regional Office in New Delhi and the professors of I.I.M. Ahmedabad., who took a lot of pain and trouble to share their knowledge with us, with special reference to our project director of I.C.A. , Mr. M.V. Madane who took a special interest on us.

I am also grateful to the chairman and the board of directors of my society as well as the apex organization for the support and the help extended to me in participating in this course.

I also thank Rupa Jayasinghe and Nandana Gamage of our society and Mssrs S. B. Rathnayake and P.G. Joseph of Coconut Development Authority for providing me valuable information for this project.

M. B. R. Perera

06 - 02 - 1991

I SUMMERY

- 1:1 This is a project of expanding the existing processing capacity of the desiccated coconut factory through modernization. This factory is called 'M-145' and is owned by Dunagaha Coconut Producers Co-operative Society Ltd. Dunagaha. This factory is not presently operating.
- 1:2 Idle factory building and plant & machinery will be utilized where possible along with new sophisticated machinery to expand and upgrade the production of desiccated coconut.
- 1:3 By increasing the quality of the product, higher prices could be derived and thereby maximum benefit could be passed on to the farmer members.
- 1:4 Total cost of the project is Rs. 170 lakhs. Rs. 65 lakhs will be contributed by the society and the balance Rs. 105 lakhs will be borrowed as a long - term loan at 17% interest per annum. The importation of new machinery would cost Rs. 97 lakhs and the local cost component would be Rs. 23 lakhs. Existing machinery, which can be made use of has been estimated at Rs. 25 lakhs.
- 1:5 After modernization the processing capacity of the factory will be 54000 coconuts per day which is equivalent to 7250 Kgs. of desiccated coconut.

1:6 Entire requirement of coconuts will be procured from the members of the society.

1:7 The entire production of desiccated coconut will be exported.

1:8 The project life is assumed to be 10 years and the pre-operational period is one year.

1:9 At the first two years of operation, the factory would operate at 70% and 90% capacity levels respectively. From the third year onwards it would operate at 100% capacity.

Capacity levels have been based on seasonality of the produce and not on the machine capacity.

1:10 Total profit of the project is Rs. 274 lakhs.

1:11 Total raw material requirement of the project is 1047 lakhs of coconuts.

1:12 Financial analysis

* Pay - back period	5 years
* Break-even on sales	65 %
* I. R. R.	20.46%
* N. P. V.	16.62
* B. C. R.	1.1
* D. S. C. R.	1.30

II BACKGROUND

2:1 Role of Coconuts in Sri Lanka

This Chapter presents the significance of coconuts in Sri Lanka, Different coconut products, the Organization Chart of the industry, and the historical perspective of the Dunagaha Coconut Producers Co-operative Society Ltd.,.

In Sri Lanka, the main agricultural crops are as follows.

- (a) Tea.
- (b) Rubber.
- (c) coconut.
- (d) Paddy.

In terms of our exports and Foreign exchange earnings, while tea and rubber occupy the first and the second positions respectively coconut takes the third place. In particular, coconut exports stood at Rs. 1296 million in 1985 which fell slightly to Rs. 1023 million in 1989. This fall was basically due to communal disturbances in the country.

Coconut tree grows well in the wet and semi-dry zones. (low country wet zone). Average rainfall required for the coconut cultivation is a round 1600 m ltrs. per year. Yield of the coconut cultivation would

largely depend on two factors.

* Rainfall during the year

* Proper and systematic manuring on yearly basis

Yearly fertilizing is the major cost component of a coconut estate. However the government provides soft term loans for this purpose. In particular the fertilizer cost per acre is estimated at , about Rs.1400/=. All of which can be financed through a four year loan with two years of moratorium at a subsidy interest rate of 15% per annum. But this scheme is available only for those farmers having coconut plantations of one or more than 25 acres.

Life span of a coconut palm is around 50-60 years. A coconut palm would take 5-7 years to bear fruits. Once in every two months a crop can be harvested and there will be six crops in a year. Out of this three crops will be heavy and three will be lean. Lean season is normally from October to February. During the heavy season it is very difficult to sell coconuts at a remunerative price. Due to the lack of holding power on the part of farmers, coconut dealers exploit the growers and buy coconuts at very low prices which at times are just around 80% of the regular price. Unless the coconut growers get a good farm-gate price, it is difficult to manage their coconut estates profitably.

Coconut is not a highly perishable fruit. After picking, coconuts can be kept for three months without processing and therefore one could speculate the market before selling, which is highly risky.

2.2 COCONUT PRODUCTS :

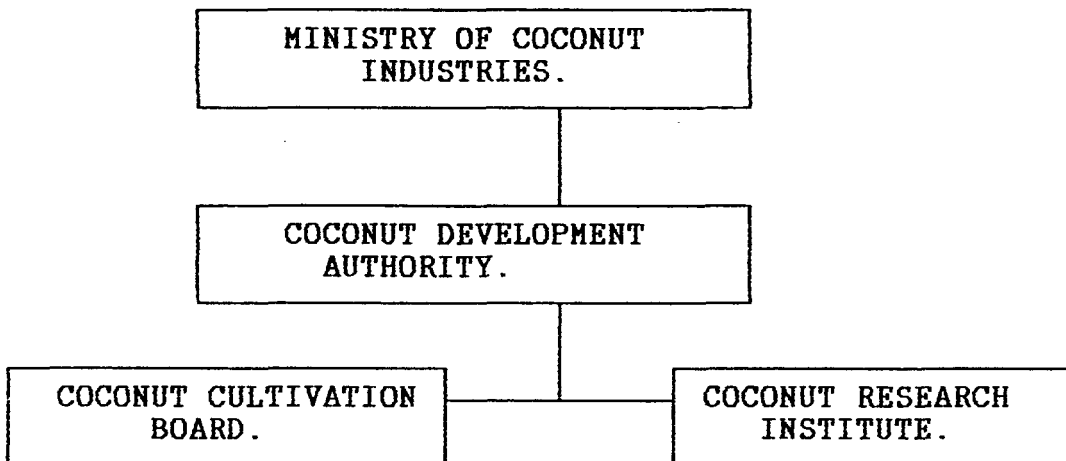
The following are the main coconut products which we manufacture.

- (a) Desiccated Coconut.
- (b) Copra.
- (c) Coconut Oil.
- (d) Fresh nuts.(used mainly in domestic cooking in the form of coconut milk).

Out of the coconut product exports desiccated coconut is the largest export earner of the country.

2:3 ADMINISTRATION AND MONITORING OF COCONUT INDUSTRY.

The administration of coconut industry in Sri Lanka is carried-out through a well designed three tier system which is as follows.



MINISTRY OF COCONUT INDUSTRIES :

The Ministry was set up in September 1978, under article 45 (1) B of the constitution with the following following subjects and functions assigned to it.

- * Matters relating to the overall development of coconut plantation, agriculture and associated processing, marketing research and industrial activity.

* COCONUT DEVELOPMENT AUTHORITY :

Established under the provisions of the Coconut Development Act No.46 of 1971, the Coconut Development Authority is vested with the following functions.

- i. Promotion of manufacturing coconut products especially by providing directions for modernization and assistance in increasing the efficiency of manufacturing industries. Conducting and furthering scientific research in connection with the processing and utilization of coconut products with the assistance of national and foreign research organizations.
- ii. Prescription and maintenance of standards of coconut products manufactured in or exported from Sri Lanka.
- iii. Regulation of export and import of coconut products including import/export prices.
- iv. Market promotion research and marketing of coconut products within and outside Sri Lanka.
- v. Regulation, control, supervision, direction, management and inspection of the manufacture and manufacturing units.

2:4 ESTABLISHMENT OF CO OPERATIVES DEALING WITH COCONUT PRODUCTS.

From the inception, government has taken all the promotional steps to increase the coconut cultivation, production, processing and marketing aspects of the coconut products.

Similarly coconut growers have been encouraged by the government to form co-operative societies to unite themselves to overcome their marketing problems. As far back as 1940, the coconut dealers were exploiting the small and medium class coconut growers by advancing money at very high interest rates and purchasing their coconuts at very low prices. Invariably the coconut growers were at the mercy of the coconut dealers. When the coconut growers were facing such hardships they had united themselves and formed co-operative societies with the assistance of the then coconut Board. Thirty nine such Coconut producers' Co-operative Societies have been organized in different areas with the common intention of overcoming the said problem of marketing their produce at a remunerative price. This is how Dunagaha Coconut Producers' Co-operative Society has come into existence in 1940.

2:5 OVERALL SITUATION :

2:5:1 LOCATION : The society is located at Dunagaha, a small town, 45 kilometers away to the north of Colombo, the sea port capital of Sri Lanka. (Please refer annexure 01 for location).

2:5:2 AREA OF OPERATION : The society has its own area of operation within the five Assistant Govt. Agent

Divisions of the Gampaha district. i.e. Divulapitiya, Minuwangoda, Katana, Mirigama and Negombo. The number of villages and the area under coconut cultivation is as follows.

Table 2.1 : Location and Magnitude of Coconut Cultivation.

A.G.A.Division	No.of Villages	Acreage Under Coconut
Divulapitiya	176	12847
Mirigama	30	2000
Katana	13	500
Minuwangoda & Gampaha	22	1400
Negombo	2	Not available as this area has become highly Residential
Total	243	16747

The climate of the command area is very much favourable for the cultivation of coconut. Average rainfall of the area is 1750-2000 mm. per year. Average yield per hectare is 6250-7500 coconuts per year. The range will mainly depend on the rainfall.

2:5:3 MEMBERSHIP : Any person who owns a coconut land within the said area of operation can be enrolled as a

member of the society. Minimum acreage requirement is half a acre. Only those who possess coconut land will be entitled to obtain the membership in the society. Shares will be allocated and issued according to the acreage. Share value is Rs.500/=per share. Share money is collected in four yearly installments. This will mostly help the small farmers to obtain membership of the society. As per the by-laws 10% interest per annum is paid on the paid-up shares beside dividends, if any. Today the society is rich with 966 active members, covering an acreage of about 7484 acres. Membership can be classified as follows.

Table 2:2 Farm Size Classification

Range	Members	Acreage
01-05 Acres	540	1567
06-10 "	219	1676
11-15 "	83	1075
16-20 "	51	922
21-50 & above	73	2244
	966	7484

The command area of the society is well irrigated and roads and traffic conditions are excellent. Presently the society is not enrolling any new members as it is not in a position to serve any more members.

Within the command area there are five desiccated coconut factories owned by the private sector. Since the motive of the society is not profit making but to give the best possible price to the members, the society is always in the forefront where The Price fixing and purchasing of coconuts are concerned. The society has become the key institution where price fixing for the coconuts in the command area. In general the members of the society receive about 10% more for their nuts than the prices fetch by the non-members for their similar produce.

2:5:4: FUNCTIONS OF THE SOCIETY : The main function of the society is to purchase the coconuts produced by its members and to give them an attractive price by processing. Presently the society owns three desiccated coconut factories, two oil mills and five copra kilns.

Table 2:3 ; Coconut Consumption of the society.

Year	Quantity (LAKHS)	Value (in RS.LAKHS)
1985-86	225	245
1986-87	200	220
1987-88	126	264
1988-89	82	253
1989-90	138	270

The society mainly concentrates on the production of desiccated coconut. All the good quality nuts will be used for the production of desiccated coconut. All the cracked, immature, small and rotten nuts will be selected and diverted for the production of Copra. No good-quality nuts will be used for the production of copra.

Oil mills will be fed with copra and parings for the manufacture of coconut oil. Parings is a by-product of desiccated coconut.

Table 2:4; Desiccated Coconut Production.

Year	Coconut Processed [in lakhs]	D/C Production [in M/Tons]
1985-86	182	2564
1986-87	170	2450
1987-88	102	1296
1988-89	64	898
1989-90	104	1310

For the purpose of identification, the Coconut Development Authority has assigned a number for each and every desiccated coconut factory. The factories, owned by the society has been given the following numbers.

- 1) M 74 Situated at Dunagaha.
- 2) M 145 Situated at Dunagaha.
- 3) M 80 Situated at Kehelella.

Table 2:5; The Capacity of Existing Factories.

Factory	Capacity- (per day)	
	Nuts Processed (in thousands)	D/C Production (Kgs.)
M 74	50	6,750 Presently working
M 145	21	2,800 Not working
M 80	50	6,750 Presently working
	121	16,300

For the last four years M 145 factory was not in production. The desiccated coconut produced in the factory was poor in quality and was forced to close-down resulting a drop in the total number of nuts processed per day by the society.

2:6 Problems Faced By The Desiccated Coconut Industry.

In general the overall quality of the desiccated

coconut produced in Sri Lanka is low as compared to Philippines'.

- Reasons :
- a) Old machinery is still in use.
 - b) Manual handling is very high and thereby the expected bacterial count is very high.
 - c) Desiccated coconut involves batch-processing and there is no uniformity in quality.
 - d) After sterilization, no automation system to avoid human contamination.
 - e) In labour intensified systems, quality depends on personnel factors.
 - f) The undermentioned equipment cannot be cleaned properly to avoid bacterial contamination.

- i) Disintegrater.

- ii) Dryers.

- iii) Sifter.

Owing to the above factors, Sri Lanka as a whole were forced to export desiccated coconut at a lower price than the international market price. Presently the price difference is about 100 to 150 Dollars per M/Ton of desiccated coconut, which constitutes about 10-15% of the international price.

2:7 Needs and Justification For an Improved System :

a) Risk is minimized: Unlike any other crop, coconut cultivation is a very long-term investment, which gives revenue to the farmer regularly. The farmer is not in a position to change the crop of the land easily. Unless the co-operative society guarantees the future market for coconuts, the farmer would not be relieved of the risk of the future demand for coconuts.

b) International Quality Standards :

The co-operative society is not in a position to ensure the future market for coconuts unless it increases the quality standard of desiccated coconut produced by the society. This would only be possible by modernizing the existing production process to match with the international quality standards.

c) Competition : Stiff competition in the

international market with the other foreign manufactures is facilitated. Unless the desiccated coconut produced by us is up to the standard no one would buy from us nor could we bargain for a better price. If no steps have been taken to increase the quality standards, foreign competitors would definitely dominate the market.

- d) Commanding Position : If the product that we manufacture is upto the international standards, the society is more independent and self-reliant.
- e) Food Product : Desiccated coconut is a food product which would be consumed in foreign countries without further processing. It is our responsibility to process the Product in such a hygienic way to suit the international standards.
- f) General Policy : Exporting of coconut products is one of the three major sources out of which we earn foreign exchange. It is the government policy to up-grade all the desiccated coconut factories in order to increase the quality of the product to suit the requirements of the foreign buyers. This would enable the country as a whole to increase the foreign exchange earnings through the export of desiccated coconut Government. has agreed to give a outright grant of Rs.600,000 to those factories which are going for modernization.

2:8 Anticipated Project Benefits :

- i) If desiccated coconut produced by the society fetch a higher price, purchasing price of the coconut could also be increased proportionately so that ultimate benefit will go to the farmer.

- ii) Through an automated system, a higher rate of recovery and uniform quality is facilitated.
- iii) Rejection rate and waste will be minimized.
- iv) Higher demand is created.
- v) Personnel factors may not influence the quality of the product.

III OBJECTIVES .

The main objective of this project is to enhance the income of the coconut growers (farmers) by processing their coconuts and producing desiccated coconut which could be exported to any part of the world. These objectives will be achieved through :

- a) Securing a competitive price for the final product.
- b) Providing a higher price for raw coconuts of the members.
- c) Improving the product quality through reduction and uniformation of moisture , grading and minimizing bacterial count.
- d) Modernizing the production techniques and thereby increasing the yield of desiccated coconut.

- e) Expanding the production to take the advantages of economies of scale and thereby effecting cost reduction.

IV PROJECT TO MODERNIZE M-145 FACTORY

- 4:1 In order to increase the quality of the desiccated coconut produced by the society, it is necessary to modernize the M-145 factory which is presently closed down. This is an expansion project through modernization.
- 4:2 This factory is situated in the same premises of M-74 factory at Dunagaha.
- 4:3 On modernizing the factory, the processing capacity will be augmented up to 54000 coconuts per day which is equivalent to 7250 Kgs. of desiccated coconut.
- 4:4 Modernizing:
- (a) Same old factory building will be utilized to house the machinery.
 - (b) Automated systems will be introduced after sterilization of coconut kernel so that, manual handling will be minimized.

- (c) Philippine type of disintegrater will be used to disintegrate coconut kernel into uniform particles.
- (d) Drying of coconut kernel will be done by a Kilburn automatic dryer which will be operated with steam. A steam boiler will be installed to obtain the necessary steam to run the dryer. The advantage of using steam to dry desiccated coconut is that the colour smell and the taste of desiccated coconut will be of very high standard. A Waste Heat Unit will be coupled to the boiler to obtain the energy to run the boiler.
- (e) Grading will be done by an automatic "ROTEX SCREENER" which would separate the desiccated coconut according to their respective particle sizes as fine, medium, coarse.

4:5 Procurement Of Raw-Materials (existing system):

1. Shares of the society have been allocated according to the acreage of the farmers. During the heavy season a member is entitled to supply 1000 nuts per share. During the lean season the entitlement is 800 coconuts per share.
2. Coconuts will be purchased from the members on quality basis. Price will be determined by the weight of the coconut kernel. Good quality nuts would definitely fetch a better price than the low quality nuts.

- 3 As soon as the coconuts have been picked by the members it has to be registered with the society.
- 4 Twenty one days after picking, coconuts will be ready for processing. According to the chronological order of the registration, coconuts will be husked by the huskers of the society.
- 5 Husked nuts will be transported to the society free of charge. Society has its own fleet of vehicles to transport coconuts.
- 6 Coconuts will be graded in the society as no 1, no 2 and no 3 coconuts.
- 7 A random sample of 100 nuts will be drawn separately from each and every heap, and process separately up-to kernel weight.
- 8 Daily production of desiccated coconut will be apportioned according to the kernel weight and calculate the price per 1000 coconuts for each member.
- 9 Payment will be made within 10 days after processing.
- 10 Board of Directors would determine the purchasing price of coconuts depending upon the forward sales done by the society. Since the society owns three desiccated coconut factories, the daily consumption would be around 175,000 coconuts per

day. If the society is not in a position to procure the entire requirement from the existing membership the society could enroll new members within the command area.

4:6 Processing: Production process of manufacturing desiccated coconut is comparatively simple. But more modern and sophisticated machinery has to be used, in processing coconuts. While processing, colour taste and smell are the main factors. And it should not be deteriorated while processing. The product should be free from foreign materials. Production process must be carried out as hygienically as possible. Since the product is directly used for human consumption without further processing, great care must be taken to ensure that there is no bacterial contamination while processing. Coconut kernel is highly perishable and it has to be processed within 2 hours after removing the shell. Moisture content of the kernel is 55%. This would - be reduced upto 3% by ovenning at a temperature of 95 degrees of centigrade. The desiccated coconut packed in bags could be kept for 6 months.

4:7 Quality Control : In order to maintain high quality standards it is very important to have a laboratory within the factory premises. Each and every stage of production should be checked by laboratory tests so as

to ensure that Salmonella or any other type of a germ has not been entered into the product.

4:7:1 Basic Characteristics of the Product :

- * Moisture content should be less than 3%.
- * The taste and smell of desiccated coconut should be sweet & pleasant.
- * It should be free from cheesy, smoky, soapy, sour and other undesirable flavours.
- * Bacterial count should be less than 5000 per one gram of desiccated coconut.
- * Enterobacteria count should be less than 100 per one gram of desiccated coconut.
- * It should be free from E Coli and Salmonella - contaminations.
- * Fine grade of Desiccated coconut can contain only 20% Medium grade and the Medium grade can contain only 20% Fine grade.
- * Fine & Medium grades of desiccated coconut should confine to the respective particle sizes.
- * According the tintometer test, colour should be as follows :
 - i. Red -Less than .2
 - ii. Yellow -Less than .7
 - iii. Blue -Less than .1

4:8 Marketing :

- a) Unlike other products desiccated coconut will be sold forward before the production takes place. Forward sales involve a lot of risk as the market has to be speculated depending on local and foreign market conditions. Just to minimize risk, it is always better to sell forward only for a month or less than a month, depending upon the market conditions.
- b) In Sri Lanka there is no local market for desiccated coconut. It has to be dependent upon the International market.
- c) Desiccated coconut will be sold to local shippers through brokers appointed by the Coconut Development Authority. Sales will be done on contract basis.
- d) Presently our desiccated coconut is exported to E.E.C. countries and to the Middle East. After modernization we can export to North American market too.
- e) Desiccated coconut will be packed in buyers' bags. Therefore sales has to be done beforehand.
- f) Each days' production will be sampled by the Coconut Development Authority on the following day. After the sampling, goods can be dispatched to the

respective buyers' stores.

- g) The society will have to issue a quality certificate. when dispatching goods to buyers stores. This has to be done according to the requirements of the overseas buyers and in accordance with the sales contract.
- h) Sri Lanka coconut producers' co-operative Society Union Ltd., is our apex organization which is trying hard to take-over the marketing aspect of all the coconut producer's co-operatives.
- i) Presently very few exports are done through the apex organization. This organization is reorganizing its' activities in such a way, so that it could handle the exports of desiccated coconut produced in all the co-operatives.
- j) After modernization of M 145 factory, it is possible to issue a quality certificate for its production and all efforts will be made to export the produce through the apex organization.
- k) The desiccated coconut that cannot be exported through the apex organization would be exported through the local shippers.

4:9 By-product Processing : Parings is a by-product of desiccated coconut which has a market-able value. Presently the society is having two oil mills with four

oil expellers. All the parings which we get from M 145 factory will be cut and dried then and there to avoid getting rancid. The dried parings will be issued as input to the oil mill. 40 Kgs. of dried parings would be obtained for one M/Ton of desiccated coconut. When processing the parings the output will be as follows :

61% - oil.

35% - Poonac.

04% - Normal loss.

100%

====

Parings oil cannot be exported but it can be sold locally for cooking purposes and for manufacturing of soap. Parings poonac also cannot be exported but it has a market locally. The other by-products are as follows

i) Broken shells.

ii) Coconut water.

Coconut shells cannot be burnt within the factory premises. And this will be sold out. Industrial oil could be extracted out of coconut water; 3.5 Kgs. of Majan oil could be obtained out of coconut water in 1000 coconuts.

4:10 Backward Services to Members :

i) Husking and transportation of coconuts will be done

by the society.

- ii) Once the coconuts have been registered with the society, a member is entitled to get a crop loan of 75% of the value value of the coconuts registered. No interest will be charged on crop loans and the duration of the loan is 4 months.
- iii) Fertilizer will be supplied to members in time on credit basis. No interest will be charged on fertilizer loans and the duration of the loan is 14 months. Fertilizer will be delivered to the members' estates free of charge.
- iv) Induce participation spirit of farmers through return of profits, second payments and interest on share capital.
- v) Death Donation scheme has also been organized among members.
- vi) The society also ploughs the coconut estates of the members at a very nominal fee.
- vii) The society holds seminars and work-shops to educate members on latest methods of manuring, cover crops that can be developed along with the coconut plantation and on various types of subsidy schemes organized by the government to help the small farmers.

V DETAILS OF OPERATION .

- 5 : 1 Husking of Coconuts : Husking of coconuts will be done by the society. When the nuts are ready for husking, huskers will be sent by the society to husk the nuts which are lying in members' estates. Husking is done manually and the huskers will be paid on piece-rate basis. A husker will husk about 1500 to 2000 nuts per day.
- 5 : 2 Transporting of Coconuts : Husked nuts will be transported to the society by tractors and lorries owned by the society. Nuts will be counted in the presence of the owner and a receipt will be issued before removing the nuts from the estates. Loading of coconuts is done on daily pay basis.
- 5 : 3 Sorting of Coconuts : This is highly a skilled job. All the coconuts that has been transported to the society, will be sorted by a special gang who will be paid on daily pay basis. Sorting will be done as follows:

Good Nuts	- No:1	Grade
Split Nuts	- No:1	Grade
Immature Nuts-	No:2	Grade
Small Nuts	- No:2	Grade
Germinated Nuts	No:2	Grade
Rotten & Empty		
	Nuts-No:3	Grade

- 5 :4 Feeding of Coconuts : Feeding of coconuts into the factory bins will be done manually. All the coconuts, that has to be processed has to be put into these bins. Employees will be working on piece rate basis.
- 5 :5 Hatcheting : Removing of the coconut shells will be done manually. This is highly a skilled job and will be paid on piece rate basis. Each person will remove the shells of about 2700 coconuts per day and work for about 10 - 12 hours.
- 5 :6 Shaving : Shaving or peeling the brown layer of hatcheted coconuts will also be done manually and this too is highly a skilled job. Wages will be paid on piece rate basis. Every hatcheter will require a shaver or peeler. This is a section where lot of supervision is needed. If shaving is not done properly it will effect the quality of the product, and if shaving is done more vigorously, out-turn will be low and the members will get a low price for their nuts. Working hours will be slightly more than the hatcheting time.
- 5 :7 Washing : Shaved or peeled coconut kernel has to be washed manually. Coconut kernel will be collected in stainless steel tanks for washing. Washing will be done in two stages. Wages will be paid in piece rate basis.

- 5 :8 Sterilization : Coconut kernel will be sterilized by passing it through boiling water for a period of 90 seconds. This would enable to kill the germs if any in the coconut kernel. The entire process is done with the help of screw conveyers. Oil fired burner is installed to heat up the water and this will operate continuously right throughout the process until the work is over.
- 5 :9 Disintegrator : Sterilized coconut kernel will be sent through a screw conveyor into the disintegrator. Here the kernel is disintegrated into small particles. Disintegration is done according to the market requirements.
- 5:10 Drying : This is the most crucial part of the process. Disintegrated wet coconut will be fed into the dryer through a conveyor. In this process 55% moisture content in raw coconut kernel will be reduced upto 3%. Drying temperature is 100 degrees of centigrade. Drying capacity is around 500 Kgs. per hour. Drying time is about 14 hours per day.
- 5:11 Sifting and Packing : Dried desiccated coconut is graded as Fine, Medium, & Coarse, depending on the size of particles. Desiccated coconut is fed into the sifter through a conveyor/feeder. Graded desiccated coconut is packed into bags according to the buyer's requirements.

- 5:12 Sealing and Stitching: Desiccated Coconut is packed in thick polythene bags which will be sealed by a polythene sealer and the outer craft paper bags will be stitched properly by a stitching machine.
- 5:13 Labeling and Marking: All the desiccated coconut bags produced is labeled , issued by the Coconut Development Authority . This labels are numbered and the bags could be identified with the serial numbers . Identifying a Particular bag or bags is very important for the purpose of quality checks. Date of production, The grade , and the factory number will be clearly marked on the bags.
- 5:14 Sampling : Coconut Development Authority collects 10% random sample on the number of bags produced in each day. These samples will be collected on the following day by the C.D.A. Inspector. After drawing the samples, bags could be dispatched to the respective local shippers. If any quality defect is found subsequently by the C.D.A., they have the power to stop exporting of the particular day or days production. If there is any such problems another sample of 25% will be drawn and tested again.

VI SOURCES OF FUNDS

Under this, the total project outlay, the societie's contribution, the extent to which finance to be arranged, and the domestic & foreign cost components are shown.

;1:

THE SUMMARY OF THE INVESTMENT.

NO	Items	Domestic (Rs. '000)	Foreign (Rs. '000)	Total (Rs. '000)
1.	New machinery	2,287	9,653	11,940
2.	Existing machinery	2,465	-	2,465
3.	Pre-operative expenses	1,237	-	1,237
4.	Margin money			1,200
5.	Contingencies.			<u>758</u>
	TOTAL -			17,600
Less:	Govt. subsidy			<u>600</u>
	TOTAL PROJECT COST			<u>17,000</u>

2

FINANCED BY :

(Value in Rs. Lakhs).

Total Project Cost	Society Contribution	To be Financed
170	65	105
Percentage of Contribution	38%	62%
Cost of Capital	18%	17%

(Loan period 8 years including 2 years of grace).

3:1;

SOCIETY CONTRIBUTION.

(Value in Rs. Lakhs.)

Amount	Existing Mach.	Funds	Total.
65	25	40	65
Percentage	38%	62%	100

6:3 Advice on technical and managerial aspects of the project could be obtained from the Coconut Development Authority free of charge.

VII PLANT AND MACHINERY TO BE INSTALLED

7:1 Type of Machinery :-

Basically there are five different types of machinery needed for this project. They are as follows.

- a) Startech Power Grinder :- This is also called as Philippine type disintegrater. This is specially designed and manufactured in Philippines to disintegrate coconut kernel. It can be easily cleaned as and when required. Any type of fancy cuts could be obtained by changing the cutter discs. The capacity of the machine is one M/Ton of raw coconut per hour. This would mostly help us to uniform

the particle size and shape.

b) Kilburn Dryer :- This is an Indian made vibratory fluidised bed dryer from which identical results could be obtained as of the American "Proctor Schwantes dryer" which is the most popularly used dryer for drying wet coconut in other desiccated coconut manufacturing countries. Kilburn Dryer is a two stage dryer made out of stainless steel and can be easily cleaned. This is a fully automatic dryer and no manual handling of what so ever is involved in drying coconut. Drying temperature can be adjusted up to any level to suit the requirements. The drying capacity is estimated at 500 kgs of desiccated coconut per hour. Drying temperature will vary from 130 - 140 degrees of centigrade in the first zone and in the second zone the temperature will be from 100 - 120 degrees of centigrade. The required temperature to dry wet coconut is 100 - 120 degrees of centigrade.

c) Multifuel combination boiler :- A boiler will be coupled to the dryer to obtain steam to heat up the dryer. This boiler will be imported from Malaysia through our local agent

in Sri Lanka. Any type of fuel ie. fire wood, coal, gas or steam could be used to operate this boiler. This unit will produce 2.7 M/Tons of steam per hour. Our present requirement is 2 M/Tons per hour.

d) Waste Heat Recovery Unit :- This is a new technology of obtaining energy, which has been introduced to us by Tropical Development Research Institute of united Kingdom. Heat evolved through carbonization of coconut shells will be utilized as a source of energy. This would enable us to cut down the fuel cost of running the boiler. In Sri Lanka wood is becoming increasingly scarce and therefore relatively costly to use. In using coconut shells as the sole raw material required to run this unit there is no additional cost to the society. Income from shells derives from the sale of charcoal produce in the unit and there is no opportunity cost involved in using shells. This unit can be locally made.

e) Rotex sifter :- This is an automatic sifter and is to be imported directly from England. This will screen the different grades of desiccated coconut accurately. It is made out of stainless steel and easy to clean as and

when required.

7:2 TYPE OF MACHINERY & THE AVAILABILITY

Item	Local	Imported	Local Agent	Similar Plants.
1) Disintegrater.		Yes	No	Yes
2) Kilburn Dryer.		Yes	No	No
3) Multi-fuel Combination Boiler.		Yes	Yes	Yes
4) Waste-heat Recovery Unit.	Yes	—	Yes	Yes
5) Rotex Sifter.		Yes	No	Yes

VIII PERSONNEL

8:1 A technically qualified Project Manager will be appointed to be in charge of the over-all project during the pre-operative stage of the project. Two supervisors will be given to him for his assistance. The society is already having mechanics, electrician and a carpenter. As and when required their services also could be obtained. Most of the installations and construction work will be done on contract basis and very few additional staff is required during the pre operative period. When operating the project, Project Manager will be re-designated as Maintenance Manager.

8:2 Organization chart will be as follows :-

8:3 The labour requirement for the operation of the project will be as follows :

Process.	Labour Requirement
1. Husking.	20
2. Loading & Transporting	6
3. Tractor Drivers.	3
4. Selecting.	8
5. Feeding	4
6. Hatcheting.	22
7. Peeling.	22
8. Washing.	5
9. Disintegrating & Drying.	1
10. Sifting & Packing.	2
11. Sealing & Stitching.	1
12. Labeling, Marking & Stacking.	1
13. Cleaning.	2
14. Boiler Operators.	2
15. W/H Unit Operators.	4
16. Broken Shell Removers.	5
17. Paring Removers.	1

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IX FINANCIAL ANALYSIS

9:1 Financial analysis has been based on the following assumptions.

9:1:1 Life of the Project Period is 10 years. Gestation period is one year beginning from 1st July 1991.

9:1:2 According to the seasonality of the produce, maximum number of days the factory could operate has been worked out. During the lean season, the factory will operate at 58% capacity. Basing on the realistic capacity level, the factory will operate at 70% and 90% levels respectively during the first two years and thereafter it will be operated at 100% capacity throughout the rest of the project period.

9:1:3 Selling price has been based on the current international prices, taking into account of the premium price, which could be obtained after modernization. Desiccated coconut prices will vary according to the availability of coconuts and on world market requirements. Assumptions of unit selling prices over a year is as follows

(in Rupees)

Month	1	2	3	4	5	6	7	8	9	10	11	12
sell- ing - price	24.25	24.25	24.25	24.25	22.25	22.25	26.25	27.75	28.75	22.75	22.75	24.25
Prem- ium - price	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Total price	25.75	25.75	25.75	25.75	23.75	23.75	27.75	29.25	30.25	24.25	24.25	25.75
Expo- rtab- le price	31.50	31.50	31.50	31.50	29.50	29.50	30.50	35.00	36.00	30.25	30.25	31.50

9 :1:4 Depreciation has been charged at 12% per annum on written-down value. Depreciation over the Project - period is as follows :

(in Rupees Lakhs).

Years	1	2	3	4	5	6	7	8	9	10
Written-down value- of total fixed assets.	144	127	112	98	86	76	67	59	52	46
Depreciation at 12%-	17	15	13	12	10	9	7	6	6	5

9:1:5 Pre-operative expenses will not be recurring after the commissioning of the project. Estimated expenses are as follows :

Items.	Amount (Rs. '000)
a) Salary to the Project Manager.	48
b) Salaries to Supervisors.	41
c) Wages for miscellaneous jobs.(5 labourers)	83
d) Travelling.	45
e) Interest on fixed capital (for 6 months)	895
f) Electricity, Postage, Insurance & Telephone Charges	75
g) Cost of TEST Runs.	50
Total Cost	<hr/> 1237

9:2 PRODUCTION COST :

9:2.1 Variable Cost :

(Value in Rs. '000)

Particulars.	Capacity		
	70%	90%	100%
Raw-material cost-	22213	28559	31732
Wages including E.P.F. -	1875	2412	2679
Fuel -	445	572	635
Electricity charges -	403	519	576
Consumables -	210	270	300
Transport Cost -	378	486	540
Holiday pay -	53	68	75
Interest on working capital -	168	216	240
Insurance -	21	27	30
Firewood -	605	778	864
Brokerage -	131	169	187
Repairs & maintenance -	50	65	72
Total -	26552	34141	37930

9:2:2 Other Fixed Costs :

(in Rs. '000)

Particulars.	Value .
Factory staff salaries -	180
Administrative staff salaries -	27
Employees' Trust Fund -	80
Registration fees -	1
Travelling -	15
Security charges -	60
Stationary & telephone -	2
Total --	365

9:3 Interest and Installment of Fixed Capital : Interest on the long term loan has to be paid. Interest will be paid by the end of each year and the loan will be repaid by six yearly installments of 17.56 Lakhs. Details of which are as follows :

(in Lakhs of Rs.)

Item	(years)										
	0	1	2	3	4	5	6	7	8	9	10
Long term loan	105	105	105	105	88	70	53	35	18	-	-
Installment	-	-	-	17.56	17.56	17.56	17.56	17.56	17.56	-	-
Interest 17%	9	18	18	15	12	10	7	4	1	-	-

9:4 Requirement of Working Capital : Basing the past performances Working Capital requirement of the project has been estimated. Working capital requirement will be obtained from the bank by way of a bank over draft. Interest on the bank over draft is 20% per annum. Working capital requirement will vary with the different production levels.

Working Capital Requirement :-

Details	Amount (Rs. '000)
1) Raw materials-(no stock/on credit[/advance payment)	905
2) Finished goods-accounts receivable	3121
3) Wages-	216
4) Electricity-	48
5) Fuel-	53
6) Consumable stores-	25
7) Firewood-	67
8) Salaries-	15
9) Cash requirement-	94
10) Contingencies-	256
Total Working Capital Requirement-	4800

9:5 Margin Money :

Details	Amount (Rs. '000)
1) Crop loans to members-	226
2) Accounts receivable-	780
3) Salaries & wages-	54
4) Fuel stock-	13
5) Consumable stores-	6
6) Firewood-	17
7) Contingencies -	104
Total Requirement-	1200

FINANCIAL ANALYSIS ;

Cash inflow & Outflow Statement:

(In Lakhs)

	0	1	2	3	4	5	6	7	8	9		
		70%	90%	100%	100%	100%	100%	100%	100%	100%	100%	1
Investment	170											
<u>Inflows :</u>												
Projected c/nut sales		262	337	375	375	375	375	375	375	375		
Product income-		38	48	54	54	54	54	54	54	54		
CASH INFLOW-		300	385	429	429	429	429	429	429	429		
<u>Outflows :</u>												
Variable cost		266	341	379	379	379	379	379	379	379		
Depreciation		17	15	13	12	10	9	7	6	6		
Investment on fixed Capital		18	18	15	12	10	7	4	1	-		
Fixed cost		3	3	4	4	4	4	4	4	4		
CASH OUTFLOW -		304	377	411	407	403	399	394	390	389		
Net cash flow -		(4)	8	18	22	26	30	35	39	40		
Income Tax -		-	0.8	3.6	4.4	5.2	5.8	7.0	7.8	8.0		
Net cash flow after taxation-		(4)	7.2	14.4	17.6	20.8	24.	28.0	31.2	32.0		3
Residual value -												
Annual fund generation		13	22.2	27.4	29.6	30.8	33.	35	37.2	38		10
Cash flows for												
NPV/IRR calculations-		31	40.2	42.4	41.6	40.8	40.	39	38.2	38		10
Present value of net cash inflow -	-170	-139	-98.8	-56.4	-14.8	+26.						
Present value of net cash inflow at 18%		26.27	28.87	25.80	21.46	17.83	14.82	12.24	10.16	8.57		20
Present Value at 18%												
Present value of net cash inflows at 21%		25.62	27.46	23.93	19.41	15.73	12.74	10.27	8.31	6.83		16
Present Value at 21%												

*.Adequate to serve repayments of Long term debt which stands at Rs. 17 per annum beginning from third year.

Analysis Ignoring the cost of the existing machinery.

		Cash Inflow & Outflow Statement:									(In Lakhs)
Year		1	2	3	4	5	6	7	8	9	10
		70%	90%	100%	100%	100%	100%	100%	100%	100%	100%
Initial investment	145										
Cash Inflows :-											
Net sales		262	337	375	375	375	375	375	375	375	375
Product income		38	48	54	54	54	54	54	54	54	54
Cash inflows		300	385	429	429	429	429	429	429	429	429
Cash Outflows :-											
Initial cost		266	341	379	379	379	379	379	379	379	379
Depreciation		14	11	10	9	8	7	6	5	5	5
Investment on fixed capital		18	18	15	12	10	7	4	1	0	0
Fixed cost		3	3	4	4	4	4	4	4	4	4
Fixed cost		35	32	29	25	22	18	14	10	9	9
Cash out flow		301	373	408	404	401	397	393	389	388	388
Net cash flow		(1)	12	21	25	28	32	36	40	41	41
Tax		-	2.2	4.2	5	5.6	6.4	7.2	8	8.2	8.2
Net cash flow after taxation		(1)	9.8	16.8	20	22.4	25.6	28.8	32	32.8	32.8
Present value											
Net fund generation		13	20.8	26.8	29	30.4	32.6	34.8	37	37.8	37.8
Net cash flow for P/NPV/ R.R. calculations		31	38.8	41.8	41	40.4	39.6	38.8	38	37.8	37.8
Present value of net cash inflow	-145	-114	-75.2	-33.4	+7.6						
Present value of net cash inflow at 18%		26.27	27.87	25.44	21.15	17.66	14.67	12.18	10.11	8.52	14.9
Present value of net cash inflow at 18% cost											
Present value of net cash inflow at 25%		24.8	24.83	21.40	16.79	13.24	10.38	8.14	6.38	5.07	8.3
Present value of net cash inflow at 25% cost											

Sensitive Analysis- If selling price goes up by 10%

Cash Inflow and outflow statement.										(In Lakhs)
Year	1 70%	2 90%	3 100%	4 100%	5 100%	6 100%	7 100%	8 100%	9 100%	10
170										
Income	288.20	370.7	412.5	412.5	412.5	412.5	412.5	412.5	412.5	412.5
inflows	38.	48.	54.	54.	54.	54.	54.	54.	54.	54.
	326.20	418.7	466.50	466.50	466.50	466.50	466.50	466.50	466.50	466.50
fixed cost	266	341	379	379	379	379	379	379	379	379
cost	17	15	13	12	10	9	7	6	6	6
cost	18	18	15	12	10	7	4	1	-	-
cost	3	3	4	4	4	4	4	4	4	4
outflow	38	36	32	28	24	20	15	11	10	10
	304	377	411	407	403	399	394	390	389	389
taxation	22.2	41.7	55.5	59.5	63.5	67.5	72.5	76.5	77.5	77.5
	4.44	8.34	11.1	11.9	12.7	13.5	14.5	15.3	15.5	15.5
	17.76	33.36	44.4	47.6	50.8	54	58	61.2	62	62
	34.76	48.36	57.40	59.6	60.8	63	65	67.20	68	68
NPV	52.76	66.36	72.40	71.6	70.8	70	69	68.20	68	68
net cash inflow -170	+117.24	-50.88	+21.52							
net cash	44.71	47.66	44.06	36.93	30.95	25.93	21.66	18.14	15.33	15.33
value										
net Cash										
at 40%	37.68	33.85	26.38	18.64	13.16	9.30	6.54	4.62	3.29	3.29
value at 40%										

9:6:5

OBSERVATIONS

	DSCR	PAY-BACK PERIOD	Break-EVEN SALES	N P V	B C R	I R R
1)Original calculation 9:6:1	1.30	5 Years	85%	18.62	1.1	20.48%
2)Sensitive Analysis						
I Ignoring the cost of Existing machinery. (9:6:2)	1.28	4 Years	58%	33.77	1.23	24%
II If selling price goes up by 10% (9:6:3)	2.2	3 Years	37%	141.70	1.83	38.31%
III Selling price & Variable cost goes up by 10% (9:6:4)	1.3	5 Years	65%	15.17	1.1	20%

9:6:6 Financial viability :- On the basis of the above Analysis the project can be said to be financially viable. I.R.R. is greater than the cost of the capital which stands at 18%. This implies the project is viable. Accounts have been purposely prepared to gain marginal profits to the society so that the farmer members would get the best out of the project.

9:6:7 Net Increase on the income of the farmer.

DETAILS	COCONUTS	AMOUNT
Total profit of the project -In Lakhs.		274
Total Coconuts purchased during the project period -in '000	104700	
Profit per 1000 nuts in Rupees		261.70
Additional premium of Rs. 1/50 per kilo		202.50
Total additional benefit to the farmer		<u>464.20</u>

9:7 Direct/indirect Benefits to Farmers :

1. Farmer members can enjoy a remunerative price for their coconuts which they produce in their estates.
2. The benefits of economies of scale could be enjoyed by the member farmers.
3. Idle machinery, buildings and equipment has been made use of to increase the income of the farmer.
4. Risk of having a future demand for coconuts is minimized.
5. Country as a whole will also be benefited by obtaining the highest possible overseas price for desiccated coconut produced by the society. This would definitely increase the foreign exchange earnings.
6. More employment could be created within the area.

9:8 Expected impact on the co-operative :-

- a) Cooperative will be on a strong footing as in the case of manufacturing desiccated coconut is concerned
- b) The cooperative need not be interdependent on Others in selling desiccated coconut
- c) Strong competition with the private sector is facilitated
- d) Contented membership as regards to the functions of the society is concerned
- e) Better background services could be provided to the members.

9:9 Further Expansion :

- a) Steam Sterilization : Sterilization could be done through steam and do away the present system of sending the coconut kernel through the boiling water. Present boiler capacity is enough to generate steam for this purpose too.
- b) If the project works out according to the plan, total capital investment could be recovered in 5 years. If so the other two factories also could be modernized accordingly one by one.

X Budgeted Production & Sales

	1st Ye.	2nd Ye	3rd.Ye	4th Ye.	5th Ye.	6th Ye.	7yh Ye.	8th Ye.	9th Ye.	10th Ye.
Budgeted days										
Factory can work	140	180	200	200	200	200	200	200	200	200
Coconut Consumption (in Lakhs)	86	97	108	108	108	108	108	108	108	108
Production of D C in M/tons (in Lakhs)	12	13	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
<u>By Products</u>										
1. Broken Shells (in Lakhs)	86	97	108	108	108	108	108	108	108	108
2. Parings- M/tons (in thousands)	467	526	584	584	584	584	584	584	584	584
3. Majan - oil M/tons (in thousands)	31	35	39	39	39	39	39	39	39	39
<u>Total Sale. Proc eds</u>										
1. Desiccated coconut (in Lakhs of Rs.)	300	338	375	375	375	375	375	375	375	375
2. Broken Shells (in Lakhs of Rs.)	126	141	157	157	157	157	157	157	157	157
3. Parings Sweepings & Majan oil (in Lakhs of Rupees)	24	31	34	34	34	34	34	34	34	34

XI EXTERNAL ASSISTANCE NEEDED

- 11:1 Technical Assistance : Designing of the factory could be further developed if technical assistance from abroad is facilitated. Much more sophisticated and efficient systems could be introduced with the help of foreign experts in designing the automated system. This could be implemented in stage two.
- 11:2 Marketing the Products : Although there is an export market for desiccated coconut our apex organization is finding it difficult to get proper orders at competitive prices. It is very much needed to obtain the services of foreign organizations in getting good orders for our desiccated coconut produced in co-operatives.
- 11:3 Funds needed from external sources: It is very much appreciated if the funds required to import the undermentioned items be financed by a donor organization it would relieve the poor members burden of paying interest for the borrowed fixed capital. This would help the society to save Rs.88 Lakhs., which would otherwise has to be paid as interest to the finance institution. If this is facilitated a further high price could be paid to the farmer for his coconuts and improve his standard of living considerably.

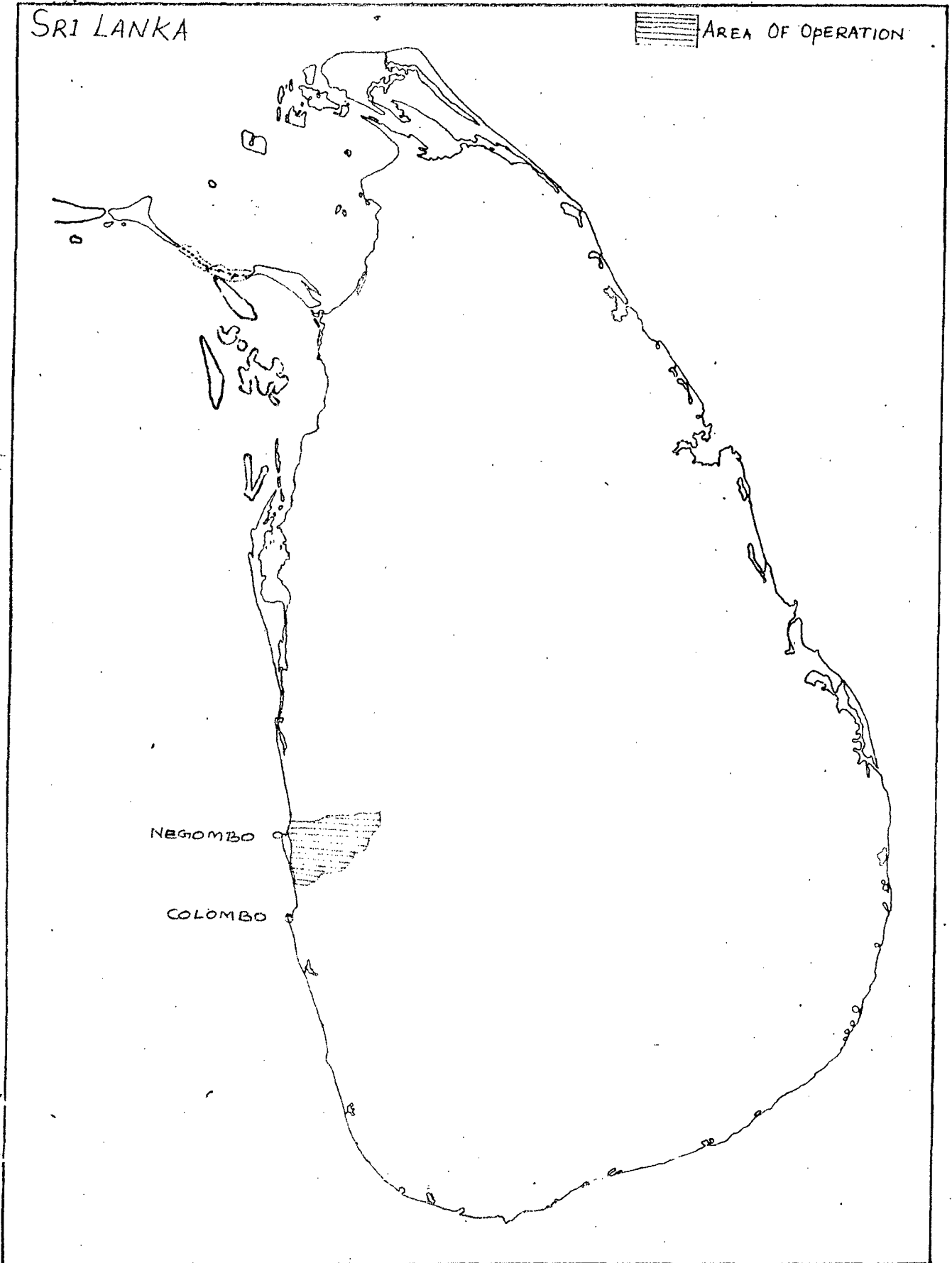
11:3:1 Machinery to be imported

	Details	Amount
	Kilburn drier	5000
	Boiler	3548
	Cutter	345
	Sifter	760
	Total Cost	9653

APPENDICES

1. MAP OF THE AREA OF OPERATION
2. BALANCE SHEET OF THE SOCIETY
3. DIFFERENT STAGES OF PROCESSING
4. SCHEDULE OF ACTIVITIES
5. ACTIVITY CHART
6. NET-WORK DIAGRAM
7. AUTOMATED PROCESSING SYSTEM
8. TECHNICAL SPECIFICATIONS OF KILBURN DRYER
9. MECHMAR MULTIFUEL COMBINATION BOILER
10. "ROTEX" SCREENER
11. "STARTECH" PHILIPPINE TYPE DISINTEGRATER

Appendix 1

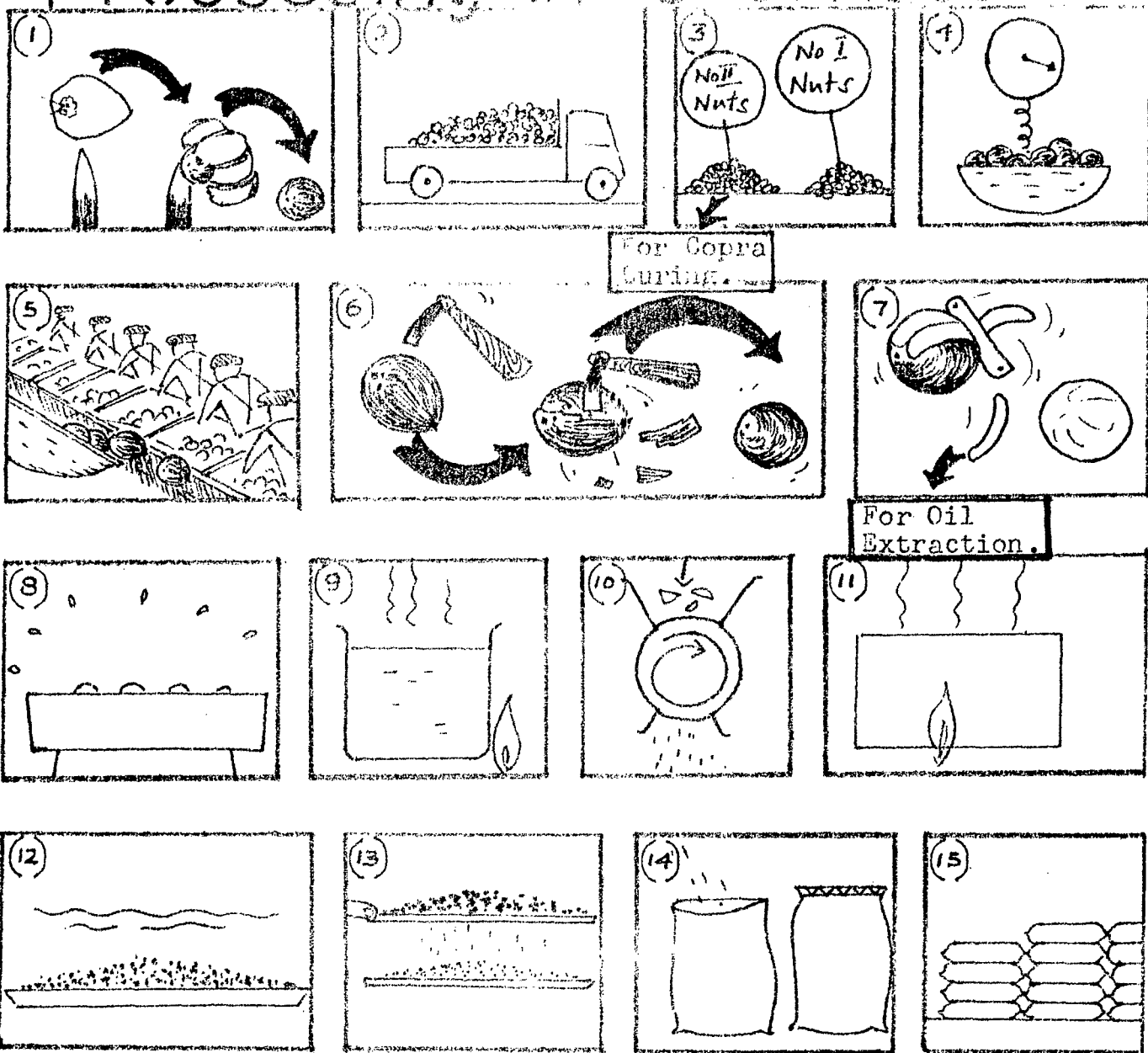


Appendix 2

Dunagaha C.P.C.S. Ltd.
Balance Sheet as at 31-3-1990.

Fixed assets:-		(Rupees in '000)	
Dunagaha	4453		
Kehelella	<u>1726</u>		6179
add:-Investments			23
			<hr/> 6202
<u>add:-Current Assets</u>			
Debtors-Trade.	6815		
add:-Bad debt Provision	<u>4866</u>	1949	
Crop loans to members		43	
Other Advances		243	
Security deposits		264	
Sundry Debtors		9	
Pre payments		365	
Stock in trade		3890	
Fixed deposits	5266		
Staff security deposits	180		
Savings Accounts	1587		
Death Donation Fund	<u>11</u>	7044	
Cash at Bank - Dunagaha	2246		
" " Colombo	40		
" in hand	<u>11</u>	2297	
		<hr/> 16104	
<u>Less Current Liabilities.</u>			
Self security deposits	73		
Members deposits	2149		
Accrued Expenses	1444		
Death Donations Fund	19		
Creditors	294		
	<hr/>	3979	
		<hr/>	12125
			18327
			<hr/> <hr/>
Represented by :-			
Shares	3231		
Shares owned by the society	471		
	<hr/>		3702
add:-Reserves:			
Statutory Reserve	3885		
Capital Reserve	8		
Other Reserves	5792		
profits	<u>4940</u>		
			14625
			18327
			<hr/> <hr/>

Processing Of Coconuts.



- | | |
|---------------------|-----------------------------------|
| 1. Husking. | 11. Drying. |
| 2. Transporting. | 12. Cooling. |
| 3. Grading. | 13. Sifting. |
| 4. Sampling. | 14. Packing, Zealing & Stitching. |
| 5. Feeding. | 15. Storing. |
| 6. Hatcheting. | |
| 7. Peeling. | |
| 8. Washing. | |
| 9. Sterilizing. | |
| 10. Disintegrating. | |

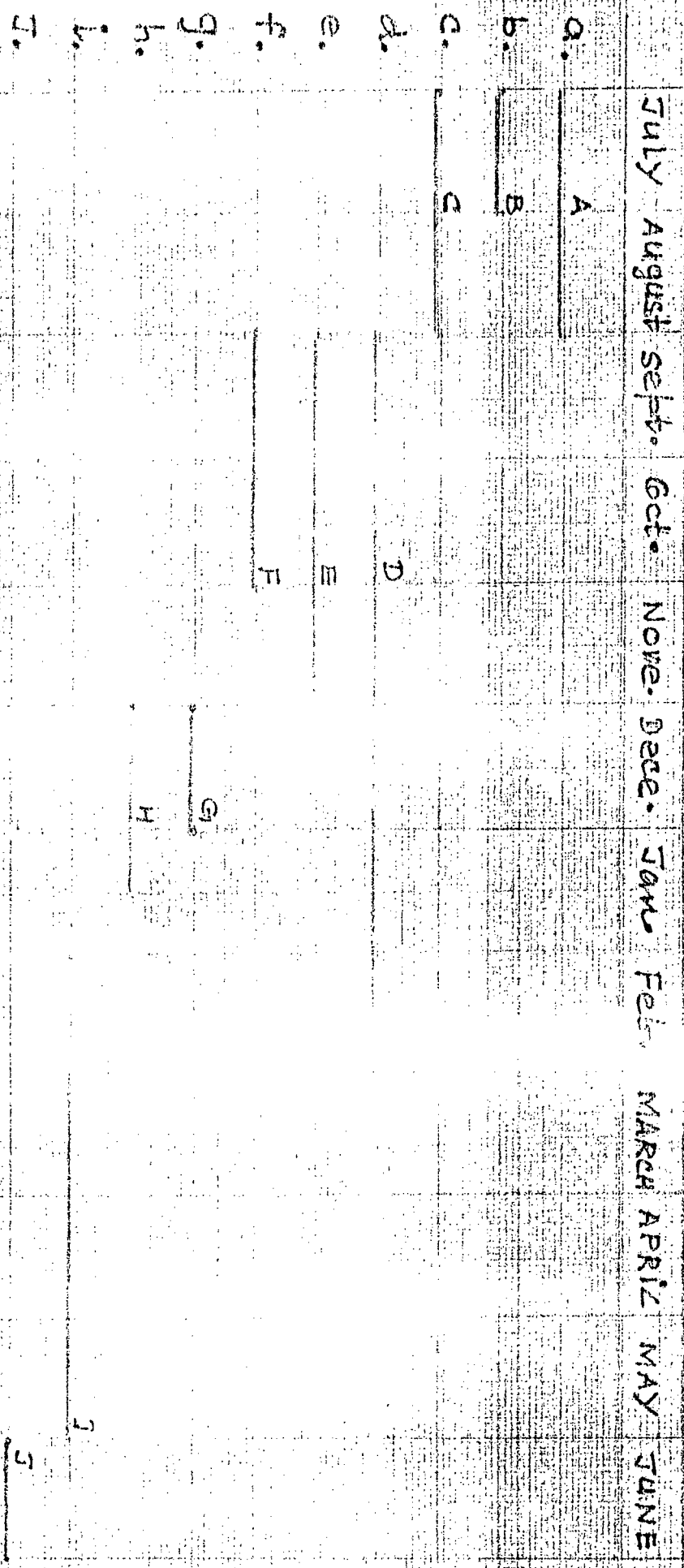
Activities For Project Implementation

	Activity	Time required in months	Preceding activities
A	Arrangement of Finance	02	0
B	Invite quotations for equipment	01	0
C	Removal of old machinery	02	0
D	Purchasing of equipment	06	A, B
E	Building renovations for new installations	03	A, C
F	Construction of boiler house and floor concretion.	02	A, C
G	Electrification	01	A, C, E, F
H	Modifications and reinstalla- tion of existing machinery	02	A, C, E, G
I	Transportation and installa- tions of new machinery	03	A, B, C, D, E, F, G, H
J	Teat runs	01	A to I

ACTIVITY CHART

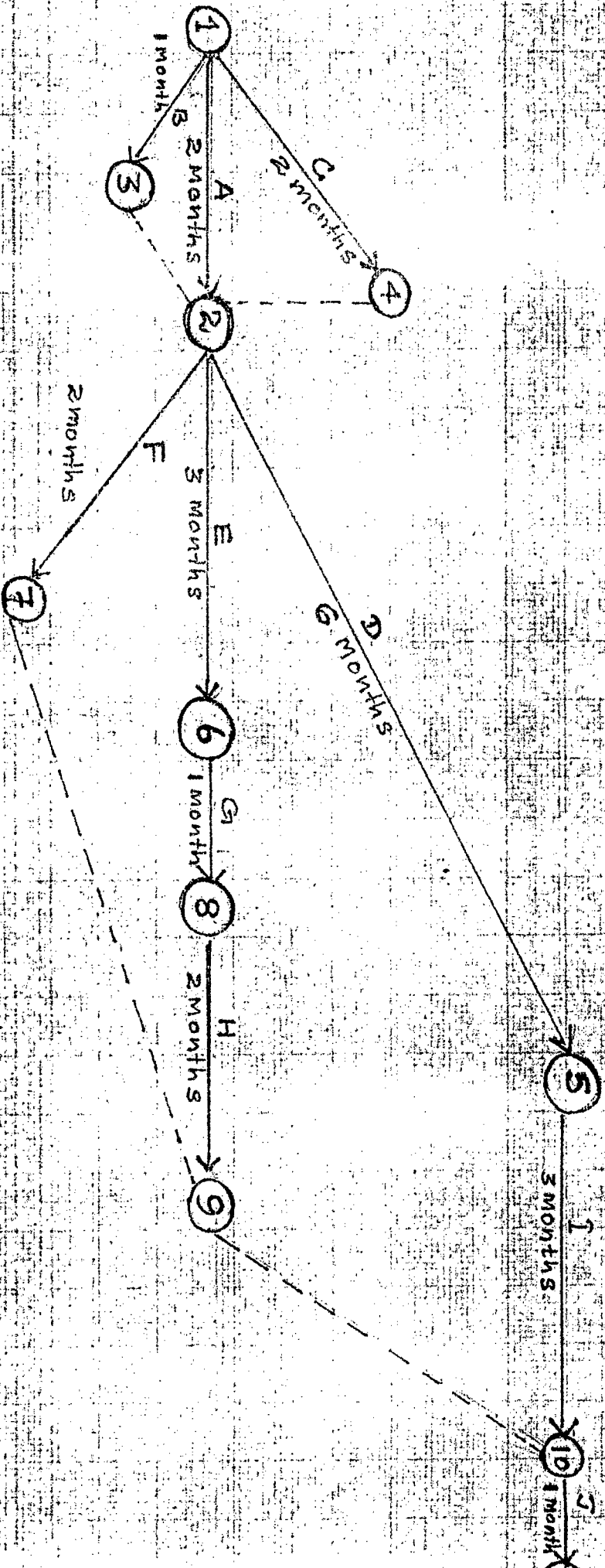
Appendix - 5

1st July 1991 to 30th June 1992



NETWORK DIAGRAM

Appendix - 6

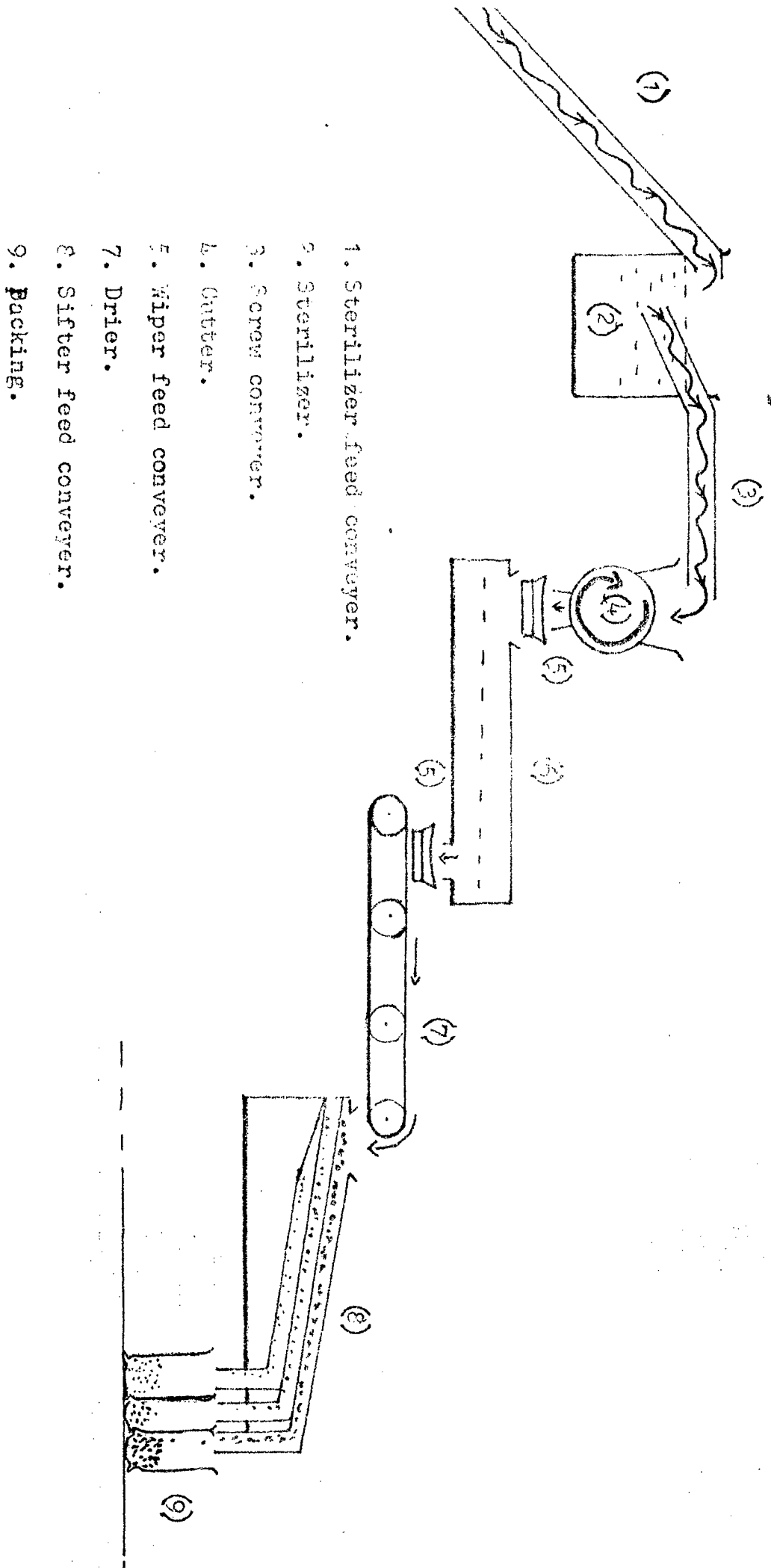


CRITICAL PATH = 1 → 2 → 5 → 10 → 11

MINIMUM PROJECT DURATION } 12 MONTHS

A → D → I → 5

AUTOMATED PROCESSING SYSTEM.



TECHNICAL SPECIFICATIONS

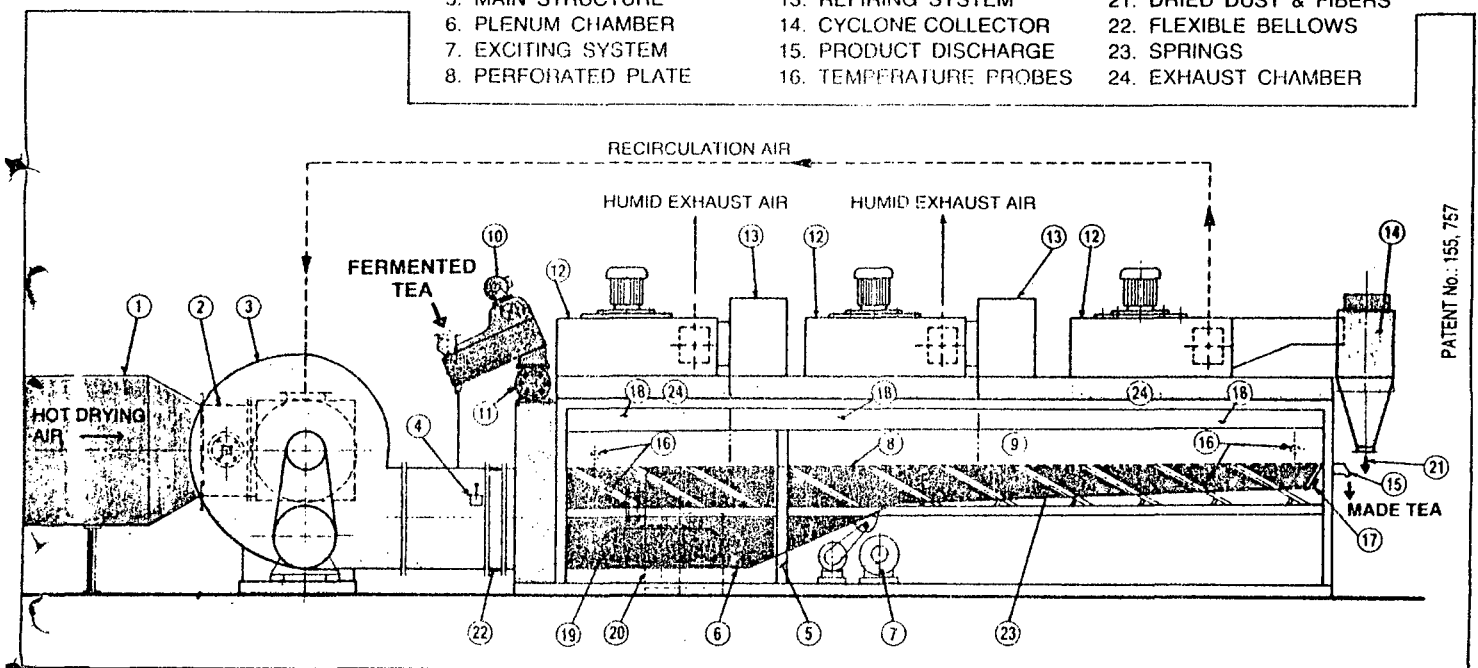
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	VFBD	VFBD-MINOR
SIZE OF DRYER	6800 mm x 1070 mm (22ft x 3.5 ft)	4900 mm x 1070 mm (16 ft x 3.5 ft)
CAPACITY*	360-600 Kg/hr* of Made Tea	200-350 Kg/hr* of Made Tea
HEAT REQUIREMENT	22000 Kg/hr of hot air @ 140°C (Volumetric flow rate (CFM) will depend upon altitude of tea estate and drying temperature used. Refer Air Flow Requirement Chart.)	13,000 Kg/hr of hot air @ 140°C. (Volumetric flow rate (CFM) will depend upon altitude of tea estate and drying temperature used. Refer Air Flow Requirement Chart.)
INSTALLED POWER:		
i) DRYING SYSTEM	28.7 kW (38.5 HP)	18 kW (24 HP)
ii) DUST COLLECTION	16.8 kW (22.5 HP)	11.2 kW (15 HP)
TYPE OF FUEL	Tea Dryer Oil (TDO), Firewood, Coal, Gas or Steam.	
FUEL CONSUMPTION	Depends on type of heater and moisture content of fermented leaf.	
DRYING TEMPERATURE	First Zone : 130-140°C Second Zone: 95-110°C	
SPACE OCCUPIED	10400 mm L x 3350 mm W x 3050 mm H (34 ft L x 11 Ft W x 10 ft H)	8550 mm L x 3050 mm W x 3050 mm H 28 ft L x 10 ft W x 10 ft H)
SHIPPING WEIGHT	8400 Kg. (approx.) without heater.	6500 Kg. (approx.) without heater.

* Exact figures depend upon moisture of withered leaf, altitude of tea estate and dust content of tea.

GENERAL ARRANGEMENT

- | | | |
|-------------------------|------------------------|---------------------------|
| 1. AIR HEATER | 9. DRYING CHAMBER | 17. INSTANT CLEANING DOOR |
| 2. HOT AIR CONTROL GEAR | 10. FEED CONTROLLER | 18. OPEN AREA |
| 3. HOT AIR BLOWER | 11. FEED DISTRIBUTOR | 19. MIXING CHAMBER |
| 4. BIFURCATING GEAR | 12. DUSTRACTOR | 20. COLD AIR BLOWER |
| 5. MAIN STRUCTURE | 13. REFIRING SYSTEM | 21. DRIED DUST & FIBERS |
| 6. PLENUM CHAMBER | 14. CYCLONE COLLECTOR | 22. FLEXIBLE BELLOWS |
| 7. EXCITING SYSTEM | 15. PRODUCT DISCHARGE | 23. SPRINGS |
| 8. PERFORATED PLATE | 16. TEMPERATURE PROBES | 24. EXHAUST CHAMBER |



61, JETAWANA ROAD,
COLOMBO 14,
SRI LANKA.
TELEPHONE: 433708, 23116
TELEX: 22494 GMW CE
FAX: 0094 - 1 - 546672



MECHMAR LANKA (PTE) LTD.

OUR REF:

YOUR REF:

16 th January 1991.

M/S. Dumagaha Coconut Producers Co-operative Society Ltd
Dumagaha.

Kind Attn: Mr. M. B. R. Perera
(General Manager)

Dear Sir,

MULTIFUEL COMBINATION BOILER

As per your request, we are pleased to submit our offer for the above as follows.

SPECIFICATION

One (1) Unit Titan Vertical Combination Waste fired steam Boiler C/W standard Boiler mountings, fittings and auxiliaries.

Model : MC 600/150
 Manufactured By : Mechmar Boilers SDN. BHD.
 Maximum Continuous Rating : 6000 PPH from and at 100 dgr C.
 Working Pressure : 150 PSIG.
 Construction/Design/Testing : British standard 2790
 Plate Material : BS 1501 - 151 - 430 - A
 Boiler Tubes Material : BS 3059 - ST 320 - ERW.
 Fuel : Wood, Veneer Waste, Coconut shell Gas with a Calarific value of about 5000 BTU/lb & moisture content not exceeding 35%.
 Fuel Handling : Manual.
 Electric Supply : 415 Volts/ 3 Phase / 50 HZ
 Inspection : Lloyd's Register of Shipping.

Scope of Supply (Foreign Cost)

Amount

1. Basic Boiler C/W.	US \$ 78,922.00
(a) One Unit electric feed water Pump.	
(b) One Unit Feed check valve.	
(c) One Unit 1st & 2nd Low water alarm level controller.	
(d) One Unit Limit control Pressurestat.	
(e) One Unit Duplex high-Lift safety valve.	
(f) One Unit Blowdown valve.	

- (g) One Unit main steam valve.
- (h) Two Units water level gauge Glasses.
- (i) One Unit Steam Injector.

Instrumentation & Non Pressure Parts

2. Induced Draft Fan C/W motor	US \$ 4050.00
3. Electrical Control Panel and wiring	US \$ 1442.00
Total Price FOB Singapore	US \$ 84414.00
Est. Freight & Insurance to Colombo	US \$ 4300.00
Total CIF Colombo	<u>US \$ 88714.00</u>

Local Cost

1. Chimney & Ducting	Rs. 250,000.00
2. Boiler House Piping	Rs. 60,000.00
3. Boiler House Construction Work.	Rs. 150,000.00
4. Platform & Catladder	Rs. 50,000.00
5. Transporting, Unloading & Installing of Boiler using a Crane & Low Bed Trailer.	Rs. 50,000.00
6. Clearing & Forwarding charges. Approx. (depends on the Duty and TT structure at the time of clearing).	Rs. 100,000.00 - 10% Duty - 15% TT. - 3% Clearing Presently Applicable Rates
7. Connecting the existing waste Heat Unit to New Boiler	Approx. Rs. 50,000.00

Terms of Payment : 100% Letter of Credit in favour of Mechmar Maju SDN. BHD.
110, Jalan Semangat 46200, Petaling Jaya, Malaysia.
(Out Bankers Hongkong & Shanghai Banking Corporation
Petaling Jaya.
A/C No: 302-311022-001).

Delivery : 3 - 4 Months from date of Confirmation.

Validity : 30 Days.

Warranty

- : We guarantee on workmanship on all equipments manufactured by us for a period of (12) months from date of Commissioning or (14) fourteen months from date of delivery whichever comes first.
- : Guarantee is excluding of all normal wear and tear and of all damage resulting from improper use, neglect, unjustified exposure, wilful acts of employees or others.

Inclusion

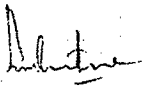
- : Commissioning of the Boiler free of charge.

Exclusion

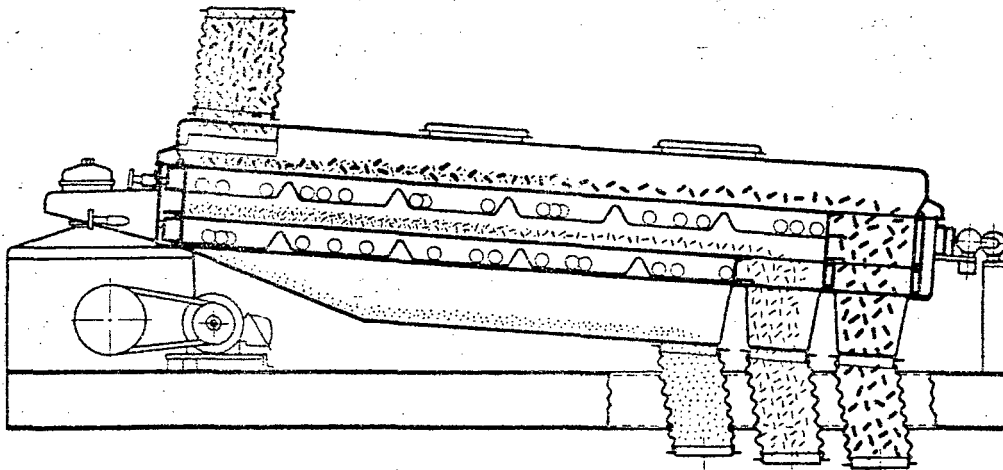
- : 1) All Civil and foundation works.
- 2) Steam piping from Boiler to Process Plant.
- 3) All Electrical and conduit works.
- 4) Any other works not specifically mentioned herein.

Thanking you,

Yours faithfully,
MECHMAR LANKA (PTE) LTD.



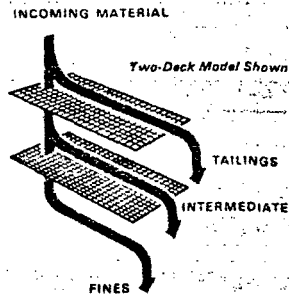
K.D.C.E. WICKRAMARATNE
DIRECTOR/FACTORY TECHNICAL REPRESENTATIVE



**ROTEX FLOW OF MATERIALS -
FAST · EFFICIENT · ACCURATE**

Locker ROTEX Screeners utilise a unique screening action that provides both accuracy of separation and high production. As shown above, material enters at top left, is distributed over the entire width of the screen surface and conveyed toward the discharge end. Larger particles remain above the screen surface, while smaller particles pass through, as determined by the screen meshes used for each particular application.

The model illustrated here is a typical two-surface ROTEX, which separates material into three different grades. Other AUTOMATIC TENSIONING models have one to four screen surfaces, producing two to five separate grades.

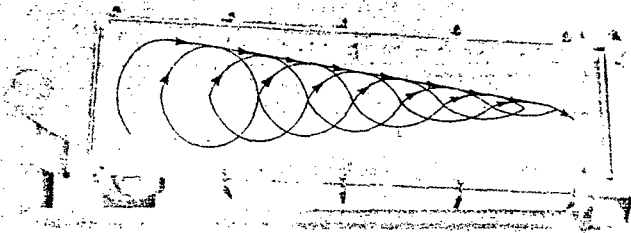


TWO SEPARATE ROTEX ACTIONS - MAXIMUM PRODUCTION · EFFICIENCY · ACCURACY

For low-cost screening on a production basis, screening machines must perform two distinct functions:

1. Give undersize material maximum opportunity to pass through the mesh openings as the material is conveyed along the screen.
2. Prevent the material from lodging in the mesh openings.

Many screening machines attempt to perform these two functions by a single screening action, which necessarily sacrifices the effectiveness of either or both. By employing two distinct screening actions, ROTEX performs each function separately and positively, as shown below, providing far more efficient screening results.



GYRATORY MOTION RAPIDLY DISTRIBUTES · STRATIFIES · SEPARATES

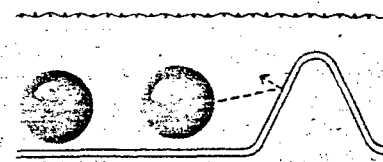
The first ROTEX action is the *gyrotory* motion of the near-level screen box . . . which combines a horizontal circular motion at the feed end, gradually diminishing through the length of the machine to an elliptical movement, and finally to an approximate straight-line motion at the discharge end.

As material is fed into the ROTEX, the circular motion immediately spreads it across the full width of the screen surface, even though it is fed from a single point. This horizontal circular motion also *stratifies* the material, causing the fines to sink down against the screen mesh. As a result, particles that are appreciably smaller than the mesh openings quickly pass through in the first part of the screen.

At the same time, larger particles float to the top and are gently and steadily conveyed toward the discharge end of the ROTEX screen box. Since this is done without violent agitation or vertical hop, the finer particles hug the screen surface

and readily pass through. As the material travels along the screen surface, it enters the area of gradually diminishing screening motion at the discharge end. This reduced action is necessary in order to screen out particles that are smaller than the mesh openings but which approach them in dimension — the "near-size" particles.

This ROTEX gyrotory action is highly efficient. It removes all fines and dust without product deterioration . . . thus recovering a greater volume of clean usable material per amount screened. In addition, because the screen surface is only 4° from the horizontal, ROTEX utilizes the full mesh openings, ensuring consistently sharp, well-defined separations even at highest production rates. This is in contrast to machines whose screens are appreciably inclined, which require larger mesh openings for a desired separation and thus allow oversize to pass through and reduce the sharpness of the separation.



ROTEX BOUNCING BALLS PREVENT SCREEN BLINDING

The second ROTEX action is performed by resilient balls confined in pockets beneath each screen surface. The machine motion causes these balls to be deflected against bevel strips and **bounces** continuously against the underside of the screen mesh, thus keeping the screen clean and preventing screen blinding. At the same time, it keeps the screen *alive* . . . providing sufficient agitation to aid particle stratification and to

separate particles adhering to one another.

The ROTEX bouncing balls ensure complete removal of undersize — even from materials that tend to clog other types of screening equipment. In many cases this freedom from binding permits smaller screen openings on ROTEX — retaining a greater proportion of desirable material that normally is lost through larger openings on other types of screeners.

Price: £ 9500 (CIF) Colombo.



STARTECH CONTRACTOR, INC.

3587 Lingayen St., Sta. Mesa, Metro Manila, Philippines

Tel. Nos. 612-264; 612-348; Telex No. 40405 ICS PM

FAX No. (63-2) 521-7225; (63-2) 819-3329

3 March 1990

Mr. Sunil J. Watawala
Joint Secretary
Sri Lanka Desiccated Coconut
Dawson St., Colombo, Sri Lanka

Sir:

For the sake of good order we are confirming herewith our firm offer to sell you desiccated coconut machineries according to the following terms and conditions, namely:

A.	Startech Power Grinder per unit.....	US\$ 5,941.00
	One (1) pc. pulley 9 x 2 1/2	12.00
	One (1) pulley 6 x 2 1/2	10.00
	Three (3) pcs V-belt Sec B	29.00
	One (1) pc sprocket #60 x 15 teeth	11.00
	One (1) pc sprocket #60 x 34 teeth	29.00
	One (1) Roll roller chain #60 x 10 ft.....	24.00
	Two (2) pcs Chain Guard	33.00
B.	Spare parts for two years operations	
	One (1) set grinder ring	443.00
	One (1) set flake disc with cutters	443.00
	One (1) set fancy disc with cutters	409.00
	One (1) set chips disc with cutters	341.00
	Six (6) pcs flake cutters	172.00
	Two (2) pcs fancy cutters	55.00
	Two (2) pcs chips cutters	48.00
	TOTAL FOB MANILA PRICE	US\$ 8,000.00

The above price (US\$8,000.00) is good only for a minimum order of twenty (20) units, otherwise the price shall be adjusted to US\$10,500.00.

The following shall be furnished by the purchaser:

1. Freight from shipping point to delivery site
2. Insurance, taxes if any on cargo
3. Motors and motor/power control

Terms of Payment:

NO downpayment with the order

- Confirmed Irrevocable Letter of Credit with Rizal Commercial Banking Corporation (RCBC) as the Advising Bank

Delivery ..

It is agreed that shipment of the twenty (20) units of the Startech Power Grinder can be made in 60 days shipping date as stated is contingent upon the receipt of all requirements to proceed with the order without delay and all financial matters satisfactorily settled. (For thirty (30) units, 90 days).

Erecting and Engineering Services

Upon completion and finalization of the fabrication and shipment of the equipment we are willing to send you our company engineers to assist you in the supervision of the erection, initial operation of the equipment and to train your operator in setting up and operating the equipment.

Our company will charge you for the engineer's time and reimbursable expenses as follows:

- a) Round trip ticket (except for more than 30 units ordered).
- b) Out of pocket travelling expenses from our office in the Philippines to the project site in Sri Lanka along with reasonable expenses for lodging, board and incidental living expenses

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	Desiccated Coconut Processing Factory Modernisation Programme
<i>COUNTRY</i>	Sri Lanka
<i>PROJECT PREPARED BY</i>	C.A.C.Fernando

Funded by the Government of Japan
and

Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

INTERNATIONAL CO-OPERATIVE ALLIANCE

Headquarters:

Route des Morillons 15
CH-1218, Le Grand Saconnex
Geneva, Switzerland

Regional Office for Asia & the Pacific

'Bonow House'
43 Friends Colony (East)
New Delhi 110 065, India

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ACKNOWLEDGEMENTS

This project on " Dessicated Coconut processing factory Modernisation programme" was prepared as part requirement for the fifth ICA/JAPAN course for strengthening management of Agricultural Co-operatives in Asia on (October 22nd, 1990 to May 10th, 1991.)

This programme helped me a lot to understand the varios aspects of Agricultural Co-operatives of South East Asian countries.

I take this opportunity to express my sincere gratitude to Mr. M. V. Madane, the Project Director of ICA / JAPAN Training course and the staff members of ICA Regional Office in New Delhi and the Professors of Indian Institute of Management in Amedabad.

I owe a special word of thanks and a deep sense of gratitude to Mr. H. P. Lionel Ganawardene, Chairman, Sri Lanka Institute of Co-operative Management for giving me the necessary advice and assistance to prepare me this report.

I must also convey my deep gratitude and thanks to Mr. J. K. George Perera, Chairman of Sri Lanka Coconut Producers' Co-operative Societies Union Ltd.,

A special word of thanks also goes to the Chairman and the Staff of National Co-operative Council of Sri Lanka.

I am also grateful to the Chairman and the Board of Directors of Kammal Pattu Coconut Producers' Co-operative Society, who extended me an opportunity to participate in this course.

A special word of thanks also goes to the following Resource Personnel.

1. Mr. U.V.H. Perera, Director, Economic Research and Development, CDA.
2. Mr. S. B. Ratnayake, Deputy Director, Quality Control, CDA
3. Mr. P. G. Joseph, Energy Engineer, CDA
4. Mr. Shantha Fernando, Management Consultant, Sri Lanka Institute of Co-operative Management.
5. Mr. T.D.J.R.D. Peiris, Regional Manager, Janatha Estates Development Board.
6. Mr. Basil Fernando , Deputy Director, Sri Lanka Business Management
7. Mr. Vinccent Weerasinghe of "Lalitha Sevana", Wennappuwa. Centre.

**CHAPTER 1 : SUMMARY OF THE PROJECT
PROFILES**

NAME OF PROJECT : DESSICATED COCONUT PROCESSING
FACTORY MODERNISATION
PROGRAMME : Kammal Pattu
Coconut Producers' Co-operative
Society Ltd., Wennappuwa

COUNTRY : SRI LANKA

PROJECT NO. : ICA/J 86/ 87/ 3D / 1

1. PROJECT PREPARED

By : Mr. Colombage Anthony Camillus
Fernando, participant of the
5th CA / JAPAN management
course.

2. JUSTIFICATION

- 2.1 Area : 14 Square Miles
Population : 64000
House holds : 12800
Target group : 3500 (Coconut Growers)
- 2.2 Present average
income level of
the area : Rs. 24,000 per head per annum
- 2.3 Present average
income level of
the members " Rs. 30,000 per annum
- 2.4 Commodities grown
Present pattern of
Processing and
Present pattern of
Marketing : (a) Commodities grown is
confined to coconut
as the main
crop, whilst mango,
Banana, Paddy, Pineapple
and vegetables are
subsidiary crops.
Processing: Present
patern of processing
could be broadly
categorised into three
distinct levels
(i) Small holders curing
their crop to copra
in small scale copra
kilns.

- (ii) Businessmen who purchase the crop and convert to copra in medium to large scale copra kilns
- (iii) Large scale mills/ Co-operative Societies that process coconut oil and Dessicated coconut on a large scale out of all commodities grown only coconut has a marketable surplus

2.5 Present Source of raw materials :

From members and Non-members.

2.6 Returns to producers:

The average return received by the grower range between Rs. 2000/- to Rs 2500/- per 1000 nuts.

2.7 Justification for the need for changing present pattern of
(a) Productivity

Productivity levels vary widely as all do not provide the necessary inputs as per coconut Research Board recommendations. Productivity levels could be improved by promoting new methods recommended. Machinery presently used to process DC is outdated by about 40 years, and the techniques do not prevent physical contact of the product at important stages, where as modern machinery is very efficient and economical in the context.

(b)

(c) Marketing

The present marketing pattern is the Producer - Broker - Shipper - Consumer where the major profits are taken by the middleman, A more acceptable system would be for the producer to market directly to the buyer who is a horizontal linkage of Co-operative structure.

2.8 Anticipated project benefits in brief

Anticipated projects would be

- (a) Increase productivity
- (b) Decrease cost of production and increase quality
- (c) A higher return to the grower.

2.9 Constraints :

Constraints in procuring the raw material is due to liquidity problems faced by growers and their having to patronise buyers who advance funds which invariably results in a poor return, whereas working within a frame work of rules and regulations in Co-operative system does not allow the flexibility enjoyed by private traders.

3. OBJECTIVES :

The main objective is to increase the income of the farmers who are the members of the Co-operative Society and to promote their participation and to increase their membership

4. NAME AND ADDRESS OF CO-OPERATIVE RESPONSIBLE FOR THE PROJECT :

Kammal Pattu Coconut Producers' Co-operative Society Ltd., Wennappuwa. SRI LANKA

4.1 Present Society membership and membership Coverage to total population :	1200 registered members - 225 regular members. 9.4% has been covered
4.2 Volume of Commodities handled :	40,000 coconuts = 5MT per day and 16 working days per month
4.3 Services to members	
Goods :	supply of fertilizer seedlings.
Services :	supply of transport, credit, advance facilities and provide technical assistance.

PLANNED PROJECT ACTIVITIES

5.1 Backward linkage

A. Aim :

- to minimise farmers risks and increase productivity.
- (1) Giving loans to farmers
 - (2) Research and Development.
 - (3) Production and Sales of coconut inputs.

Activities :

Reguler supply of all needed agricultural inputs and facilities on no profit basis.

B. Foreward linkage :

Aim

Value additions

Activities

Post harvest and marketing activities
 Handling,
 Transport,
 Storage,
 Warehousing,
 Drying,
 Processing,
 Packaging,
 Distribution.

C. Horizontal Linkage
Aim

Development of self
reliant farmers
organisation.

Activities

Decision making
Quality control
standardisation of
produce
Sharing of benefits
Overall policy
development.

Farmers ---> Primary co-operative ---> Apex union
---> National co-operative council.

6. IS THE PROJECT AN ADDITIONAL
ACTIVITY OR EXTENSION/EXPANSION
PRESENT ACTIVITY

modernisation of the
existing dessicated
coconut processing
factory.

7. ESTIMATED VOLUME OF COMMODITIES
TO BE HANDLED/INPUTS

coconuts per day
= 96,000
coconuts per year
= 19.2 million

7.1 - Channels for securing
Inputs :

Basic raw material
will be coconuts,
which the members
will supply to the
processing
unit. Additional
amount needed could
be harness within the
locality from non
members.

7.2 CHANNELS FOR MARKETING
WITHIN THE COUNTRY :

By products such as
Coconut oil, Coconut
shells and soap will
be sold through our
Apex union Sri Lanka
Coconut Producers'
Co-operative Society
Union, Colombo.

7.3 EXPECTED VOLUME OF
MARKETABLE SUPPLIES :

DC 100 % volume for
export marketing.

7.4 EXPORTED TURN - OVER :

Rs. 84.418 Million
per year

8. EXPORT POTENTIAL, IF ANY :

- 8.1 Channel of marketing the products : Through Sri Lanka Co-operative Union Ltd.,
- 8.2 Estimated export turnovers : Rs. 65 Million from K.P.C.S. Union
- 8.3 Benefit to members from exports : The benefit of the margin given to brokers and shippers will be given to the members .

9. SOURCES OF FUNDS

(Rs. Million)

- 9.1 Total project outlay : 35
- 9.2 Owned Capital : 16.186
- 9.3 Domestic cost component : 24.550
- 9.4 Foreign cost component : 10.450
- 9.5 Members contribution for the project additional shares / deposits : From Mill Development Fund grant = 0.280
- 9.6 Loans / Sources of such loans : Through the Banks, or funding agencies local / foreign
- 9.7 Government contribution if any in the form of subsidy / grant / soft loans: From Coconut Development Authority grant = 0.600 Ml.
- 9.8 Government or Government sponsored agency support for technical and Managerial activities : Support for Technical
- Support for technical activities : Coconut Development Authority
- Support for managerial activities Sri Lanka Institute of Co-operative Management.

10. PLANT AND MACHINERY TO BE INSTALLED :

- 10.1 Type of machinery : Modern machinery fully automatic.
- 10.2 Whether locally available : Some machinery could be obtained.

- 10.3 Whether to be imported : A part of the plant and machinery have to be imported such as Phillippino type cutter, Vibro fluid bed dryer, Rotex screening machine and boilers.
- 10.4 Whether local agents available for imported items : Yes, Sri Lanka Dessicated Coconut Millers' Association Colombo.
- 10.5 Whether similar plant operating in the country or area of operation if so, the capacity and the products : Recently some of the plant and machinery were introduced by private DC factory owners.

11. PERSONNEL

- 11.1 Total number of project personnel required
- | | |
|----------------|------|
| Technical | 12 |
| Administrative | 02 |
| General | 198 |
| | ---- |
| | 212 |
- 11.2 Whether technically qualified personnel locally available Yes provided they are given a training by the Coconut Development Authority.

12 PROJECT IMPLEMENTATION SCHEDULE

- 12.1 Preparatory works .
from - to 1991.08.01
1992.07.31
- 12.2 Project life 10 years.
- 12.3 Maximum capacity utilisation to be achieved by 3rd year 2400 MT/DC per year

**13. FINANCIAL RESULTS AND BENEFITS
TO CO-OPERATIVE MEMBERS**

13.1 Project

- (a) Internal Rate of Return = 27.09%
- (b) Pay back period = 3 Years 08 months.
- (c) Debt service coverage ratio = 5.3
- (d) Benefit/Cost Ratio = 1.69
- (e) Break even point = 35%
(3rd year 100% capacity)

**13.2 Estimated net increase in income
to members as a result of project
activities.**

- (1) Increase of the coconut prices from Rs.2000 to
Rs. 2500
- (2) A dividend of 12% to members
(an additional Rs. 250 per 1000 nuts to members)

**13.3 Additional employment to be generated
(in what specific fields)**

Technical	- 06
Administration	- 01
General	-133

**13.4 Other direct/indirect benefits
to members**

- (1) A reasonable price for the nuts
- (2) To avoid risk in the flush season for coconut prices
- (3) the members will get a premium price for their products.

**13.5 Expected impact on the
co-operative implementing
the project.**

- (1) Utilising the existing plant and machinery for good use.
- (2) To keep the prices of coconuts in a reasonable level.

14. EXTERNAL ASSISTANCE NEEDED

14.1 Technical assistance/services of experts for project preparation and its implementation

We need technical assistance.

14.2 Training facilities within the country/abroad

Food processing training should be obtained from a foreign institution

14.3 Assistance in marketing the products locally/abroad

to get a foreign market for our exports.

14.4 Funds needed from external sources.

Rs.17.934 (Million)

14.5 Assistance for setting up plant and machinery

we require assistance from outside experts

14.6 Whether External assistance needed for managing the plan

no, we expect to train the personnel in our Society

CHAPTER 2: BACKGROUND

2.1 OVERALL SITUATION

Sri Lanka (Ceylon) has an area of 25.3 thousand square miles or 65,000 square kilometers. The island is situated between 5deg. 55min. and 9deg. 50 min. North latitude and between 79deg. 42min. and 80deg. 52min. East longitude.

Rainfall is of three types monsoonal, conventional and depressional. Monsoon rain occurs during the two monsoons. The annual average rainfall varies from below 40 inches in the driest zones and 200 inches at certain places of the hill country.

Agriculture continues to occupy in an unrivalled position in the national economy. Foreign exchange earnings are mainly from the three major export crops Tea, Coconut and Rubber. Coconut production continues to be subjected to varying fluctuations.

The Coconut industry occupies a prominent position in the economy of the indigenous population of the approximately 452,000 hectares of coconut land in Sri Lanka, roughly 3/2 consist of small holdings, i.e. to say of allotments of eight hectares and under, and practically the whole of it is Sri Lankan owned. It is essentially the small man's industry.

The Sri Lankan banking Commissioners after a comprehensive investigation into the economic life of the country expressed the opinion that from the point of view of its importance to the export trade of Sri Lanka, the Coconut industry can claim an equal rank with Rubber, but considering with the reference to the place it occupies in the village economy it should take precedence over all the agricultural industries in the island.

The Coconut palm is indeed a tree of life to the Sri Lankan villager. Though Sri Lanka ranks fourth among the coconut producing countries in the world, it is still the second largest manufacturer of Dessicated Coconut (D.C.) responsible for the supply of about 50,000 Metric Tons or 35% of the total volume of D.C. traded in the world annually.

(a) Area under Coconut Cultivation

- No. of Holdings	- 704448
-Total area (Acres)	- 1,028,162 (One Million)
-Bearing Acreage	- 923,100

(b) Foreign Exchange earned

Coconut products (Rs. Million)	- 2,865
Percentage of total earned	- 5.1

(C) Contributuin to G.N.P.
(Constant factor price 1982)

Total agriculture	- 28.3
Total plantation	- 5.5
Coconut products	- 2.7

(d) Employment

-Coconut plantations	- 1,00000
Manufacturing industries	- 35,000

(e) Domestic Consumption

Estimated Domestic Consumption in relation to population 1985 - 1989 average nuts per person 113.4 per year

Source : Ministry of Plantation Industries
Plantation sector statistical pocket
book 1990 - page 76
See also annexure No.1

2.2 Area of project

Kammal Pattu Administrative region has an area of 14 square miles or 8960 acres. This Administrative region is situated 50 kilometres away from the capital City of Colombo. The western side of the area is bounded to the sea. It is a flat area. The soil is fertile. Most of the soil consists of sandy loam and clay loam soil

Here the main pattern of rainfall is monsoonal. The average annual rainfall of the coconut triangle is 74.19 inches

Total population in the area is about 64,000. Persons with household is 12800

According to employment persons with households is tabulated below :-

Employment Pattern

Job	Description	No. of Household	Percentage
1.	Labourers	4600	36.0
2.	Coconut cultivators	3500	27.4
3.	Fishermen	3100	24.1
4.	Paddy cultivators	800	6.3
5.	Small Traders	340	2.6
6.	Employees	130	1.0
7.	Others	330	2.6
Total		12800	100.0

In the command area most of the land is utilised for coconut cultivation.

Land Utilisation

Land	No. of Acres	Percentage
1. Coconut	8100	90.4
2. Paddy	400	4.5
3. Garden crops	160	1.8
4. Other crops	300	3.3
Total		8960
		100.0

The annual income of the coconut cultivators in this area is about Rs. 12,000/- The total dependents from coconut cultivation is very much less. The general practice is in addition to coconut cultivation, they are engaged in some form of employment or in a industry.

See also - Annexure No.2.

2.3 Problems faced by farmers

(A) There is limited money in the hands of the farmers, as a result they don't use fertiliser insecticides, pesticides and weedcides. The crop has decreased as anticipated by the Coconut Research Institute.

(B) The relationship between coconut cucltivators and the co-operative is not satisfactory.

(C) In order to improve their products they do not have the credit facilities for input supplies, processing and marketing.

(D) 60% of the coconut cultivators does not have the practice to process their products through the co-operative.

(E) Generally the coconut cultivator who is working within the framework of the co-operative does not have the opportunity to obtain their advanced payments and the money for the products immediately.

In the small holdings the farmer has a habit to obtain advanced payments from money lenders who collect coconuts, as a result the farmers are under obligation to the lower prices quoted by the money lenders in the open market. They don't get a reasonable fair price for their products from money lenders.

There is an uncertainty and a risk to the farmers specially in the flush season to get a fair price for their products from these scrupulous money lenders.

2.4 Commodities grown, present pattern of processing/marketing.

Cropping Pattern

The Cropping pattern on coconut properties is closely tied up with rainfall and also the type of management of these properties agriculturally. However, it is important to understand that even if agricultural practices are adopted, rainfall failure has severe repercussions on the crop, though agriculturally well managed properties will maintain the effects of a drought to some extent. Crops will vary in proportion due to the rainfall pattern within the year.

The distribution pattern of the coconut harvest within a given year is of fundamental importance to an industry. It is the normal custom to harvest the coconuts at bi-monthly intervals. According to research conducted by the Biometry Division of the CRI the relative strengths of the six picks are as follows :

Percentage of Annual Harvest

Picks	Months	%
01	December/January	10.3
02	February/March	16.5
03	April/May	22.7
04	June/July	21.7
05	August/September	16.9
06	October/November	11.9

		100.0
		=====

The main activities of the Society at present are the processing and marketing of the following coconut products, for local consumption as well as for export:

- Desiccated Coconut
- Coconut Oil
- Coconut Poonac
- Coconut Parings
- Coconut Shell Charcoal and
- Bar Soap

Fresh coconut is the basic raw material utilised for the manufacture of the above products and the society needs around seven million coconuts per annum for its current activities, using 40,000 coconuts per day, in one shift, and working 16 days a month for the whole year.

The society is a member of the Sri Lanka Coconut Producers' Co-operative Societies Union Ltd. (COCONION), Coolombo 14 and most of the export activities of the member societies are handled by the Union. Desiccated coconut is the single major product supplied by the member societies for export and the societies themselves do not handle any exports direct.

The total acreage of the coconut holdings owned by the members of the members of the Society amounts to 2320 acres and the annual yield of these holdings is in the region of seven million coconuts in a normal year of production. As a rule the coconuts available with the members are sufficient to meet the requirements of the society, but in a short crop year coconuts are also purchased from non members to supplement the society's requirements.

Payments made for coconuts supplied to the society are on the basis of DC outturn and in the case of well maintained estates, it is very much above the average prices obtained for coconuts in the open market in the areas nearby.

2.5 Need and Justification for the project.

DC is a 100% export product for Sri Lanka and almost 80% of the Society's income is earned from the manufacture and sale of DC for export. However, the machinery and equipment currently in use at the Society's DC factory are old and outdated, and this hampers the output, quality and earnings of DC manufacture at this factory.

The international DC market is highly sophisticated and very competitive, quality is the key factor that determines the prices and the market stability of the product. Philippines which is Sri Lanka's Major competitor in the DC export trade and which accounts for almost 60 to 70 % of the world's exports of DC has modernised and automated all its DC factories so as to ensure a very high quality of the product manufactured in their factories. This modernisation and advanced technology used in the manufacturing processes of their factories had enabled them to dominate the international DC market and helped them sustain their hold on the more sophisticated markets of US and Canada over the past several decades. DC exported to these supermarkets commands a premium of around US \$ 150 per MT and it is precisely to take advantage of these premiums that some of the local entrepreneurs are establishing super DC factories with foreign collaboration. Unless the Society's factory is upgraded without delay, it will not be possible to market its DC in competition with the super DC factories now emerging in the country.

Although the existing land and a part of the buildings now in use will be utilised, the machinery equipment, and all installations under the modernisation programme will be entirely new and technology on par with the super DC factories and when completed, the new factory will conform to the highest standards required of a modern food factory.

CHAPTER 3 : PROJECT

3.1 Objectives

The main objective is to increase the income of the farmers who are also the members of the co-operative society and to promote their participation and to increase the membership by using the following steps:-

- (i) By increasing the productivity
- (ii) By decreasing the cost of production
- (iii) By obtaining a reasonable price for their produce.

To fulfil these objectives, I wish to undertake the following activities:-

(a) Backward integrated linkage

The main activity of the project is to upgrade the DC processing manufacture. For the success of the project we require the coconut as raw material. To obtain the requirement we have to get the backward integrated linkage with the farmer. The main target of the backward integrated linkage is to minimise the farmers risk and to increase their productivity.

In view of this we expect to get a regular supply of all necessities for coconut cultivation. We will be supplying the inputs and financial facilities not concerning a profit

The coconut producers do not have surplus money to apply inputs such as fertiliser, to remedy this we hope to establish the following plan.

(a) By getting the services of the Coconut Development Officers to inspect the land and to find a suitable fertiliser mixture to improve the land.

(b) By ordering the fertiliser and transporting it to the farmer's land.

(c) The cost of the fertiliser will be borne by the society and it will be recovered from the farmer on an instalment basis.

Further to the above mentioned services, we hope to give them maintenance facilities, research to develop their lands.

We also plan to get the inputs in bulk so that we could minimise the coconut cultivator's cost.

(b) Forward integrated linkage

The main aim of the forward integrated linkage is to get a value addition to the farmer's produce. We will get only a small price if we sell it as a primary raw material. We hope to establish post harvesting facilities such as handling, transportation, storage, warehousing facilities, processing, packaging and distribution. Anchor activity of this project is processing.

(c) Horizontal integrated linkage

The co-operative Society membership when compared to the total household population is not satisfactory. In order to increase the Society's membership and participation we need a farmer's level linkage. We hope to get all the members around our Primary Co-operative which invariably is the Kammal Pattu Coconut Producers' Co-operative Society.

The Primary Co-operative Society will be attached to the Union level Co-operative named as Sri Lanka Coconut Producers' Co-operative Societies Union (COCO Union). The horizontal integrated linkage is formed on a four tier structure.

Farmer --> Primary Co-operative --- > Apex Union
--> National Co-operative Council.

The main aim of the horizontal integrated linkage is the development of the self reliant farmer organisation.

We hope to establish the following activities:-

decision making, quality control, standardisation of produce, sharing of benefits and overall policy development.

3.2 Area of operation

3.2 :1 Location

Location of the DC factory is ideal for the following reasons

- (a) Availability of raw materials
- (b) Proximity of the shipping yard and the harbour

(c) Transport facilities are excellent, because the location of the factory is adjoining a class One highway

(d) The density of the population is very high in and around the factory premises, as such we have enough availability of labourers.

(e) We have a good supply of electricity.

3.2 :2 Land & Climate

The coconut land in the administrative region KammalPattu is sufficient to carryon the proposed project. In the bye-laws of the society there is provision for coconut cultivators who have coconut lands outside the region to supply their products.

The land is flat and is accessible to install plant and machinery for the above project.

The water table is close to the surface, as such we don't have hardships as a result of excess of water or shortage of water.

The weather pattern is most suitable for processing.

3.3 Project Components

3.3. 1 Procurement of raw materials

In the Kammal Pattu Administrative region we have an acreage of 8000 under coconut cultivation

The average coconuts per acre per year is 3500 nuts. Accordingto this figure wecan estimate the crop for tjhe year is follows:-

Total Production ..	..	3500 x 8000 = 28 Million
Domestic consumption ..	..	64000 x 113 = 7.5 "
Surplus production ..	..	=21.5 "
Coconuts required for the proposed project		=19.0 "

In this manner we are able to procure the target of 19 million coconuts per year. If at all there is a fluctuation we are able to procure from an outside source.

3.3 : 2 Processing : D.C Production

We propose to upgrade our DC factory with an out put of 600 kilograms of DC per hour , operating 20 hours per day , so that the expected total DC production would be 12 metric tons per day,200 working days and 2400 metric tons per year.

3.3 : 3 Marketing

There are many different types of distribution channelled through which DC passes. These exist as a result of differences in organisation on both the consumer and producer ends of the trade.

The manufacture of DC in the project will be export orientated.

Export of Dessicated Coconut

Year	Export Qty (M.T.)	US\$ (1000)	Rs 1000i)
1985	52,187	47,806	1,296,120
1986	60,819	30,504	853,110
1987	53,236	37,507	1,103,950
1988	22,422	19,438	618,260
1989	43,205	28,388	1,0232,105

(Source - Coconut Development Authority)

The chain of distribution

Sri Lanka Producer -> Broker -> Shipper ->
Importer -> Large end users

Structure of the trade in the consuming countries is divided into four groups : The USA - Western Europe - Middle East - and other;s

In the importing countries there is a clear distinction to be made between the marketing systems which exist in the USA and in Western Europe. Trade in DC in the USA is dominated by half dozen companies each of which has a close relationship with one of the Phillipines producers. By contrast, there are many dozens of importer/dealers in Western Europe which deal with both origins. Sri Lanka and the Phillipines usually buy directly and sometimes through an intermediary i.e. a broker

(b) Forwards buying, selling and speculation

As in the case with many commodities, there are opportunities in the DC market for forward purchases to

be made by importers from producers. In recent times, however, the major origins have tended to limit their forward contracts to 3 months.

(c) Payment terms, documentation and control

Price quotations from origin are usually given at f.o.b. prices in US dollars. It is usual for shipping arrangements to be made by origin but the importers are responsible for payment of freight. The terms of payment are usually cash against documents on or before the arrival of the vessel but in no case later than 60 days after the date of the bill of lading.

3.3 - 4 Extension work

(a) Induce participation spirit of farmers through retain of profits and other services such as educational programmes for children and other social services.

(b) Education and community service - educating members on the use of modern methods and latest machinery.

3.3 - 5 By -Product Processing

Parings Oil Processing

The Parings oil milling plant has a crushing capacity of 3.5 metric tons per 10 hours. We expect 2 metric tons of oil per day and 400 metric tons per year.

Laundry Bar Soap Manufacturing Section

By taking Parings Oil as a raw material we expect to manufacture 500 Kilos of Laundry Bar Soap per day and the annual capacity to be 100 metric tons.

CHAPTER 4 - DETAILS OF OPERATION

(See also Annexure No. 3)

4.1 = Location

The office of the Wennappuwa Kammal Pattu Coconut Producers co-operative Society Ltd., is located in a site of 4 1/2 acres. The D.C. Factory is also located in the same site.

4.2 = Products

The main product manufactured is DC. The by-products are Parings Oil and Laundry Bar Soap and coconut shells.

4.3 = Capacity of Proposed D.C. Factory

The following two alternatives were initially considered:

(a) A "Super Factory" with a minimum capacity of 01 ton of DC/hour operating 20 hours per day and 200 days per year producing 4000 tons of DC per year

(b) An "up graded" factory with an output of 600 kgs of DC/hour operating either on one shift or two shifts.

(i) One Shift: 0.6 tons of DC per hour operating 10 hours per day and 200 days per year producing 1200 tons of DC

(ii) Two Shift: 0.6 tons of DC per hour operating 20 hours per day and 200 days per year producing 2400 tons DC per year

"Super Factory" -Not considered

The capital required to establish a "Super Factory" is in the range of Rs. 100 million. If the C-operative does not have the resources to generate capital of this magnitude this option need not be considered any further.

The following two options of an "up-graded" factory are considered:

- | | | | |
|-----|----------------|---|---------------------|
| (A) | 1200 T DC/year | - | one shift operation |
| (B) | 2400 T DC/year | - | two shift operation |

Incremental Benefits:

Premium

The quality of DC manufactured in the upgraded factory will be in all respects identical to the DC manufactured in the "Super Factory". As such this DC factory enjoy the premium of Rs 1.50 per kg.

- | | |
|-------------------------|---------------|
| (i) For 1200 tons/year | Rs 1,800,000. |
| (ii) For 2400 tons/year | Rs 3,600,000. |

Labour Savings

In the up graded factory, most of the operations will be done mechanically. 05 labourers per shift could be saved resulting savings as follows:

- | | |
|---------------------|-----------------|
| (i) 1200 Tons/year | Rs 60,000/year |
| (ii) 2400 Tons/year | Rs 120,000/year |

Extra Weight Gain

The maximum moisture content permitted for DC is 3%. However, in DC manufactured by the traditional process the moisture content averages around 2 to 2.5%. This margin is necessary as accurate regulation on the final moisture content is not technically feasible in the traditional process. In the up-graded version, as the final moisture content can be accurately controlled, an actual moisture content of 2.5 % is feasible, yielding an average of 0.5% gain

- | | |
|---------------------------|-------------|
| (i) For a 1200 Ton/year | Rs. 150,000 |
| (ii) For a 2400 Ton /year | Rs 300,000 |

Total Incremental Benefit

- | | |
|------------------------|--------------|
| (i) For 1200/year | Rs 2,010,000 |
| (ii) For 2400 Ton/year | Rs 4,020,000 |

Incremental Benefit per Ton	Rs 1675.00
------------------------------------	-------------------

Incremental over Heads (3rd Year)

The incremental capital of 35 million will result in the following annual over heads by way of depreciation and interest

(a) Depreciation	=	1.301
(b) Interest @ 19%	=	2.725
Total overheads		<u>4.026</u>
		=====

The overhead will be reflected in the cost of productions as follows :-

(1) 1200 Tons DC/year	=	<u>4.026</u>
		1200 = Rs 3355
(2) 2400 Tons DC/year		4026 / 1200 = Rs 1677

2400

Since incremental benefits per tonne for one shift operation of 1200 tonne/year is less than the incremental benefit, option (i) is not recommended.

Whereas on two shift production of 2400 tonne/year, the incremental benefit exceeds the incremental overheads. Hence, this mode of operation recommended.

Option (i)

1. 1200 Tonne @ Rs. 2000		Rs. 2.4 million
2. Savings on weight 0,5 % x 1200 Tonne x Rs. 22000 Tonne	Rs	0.132 "
3. Labour savings 5 x 200 days x Rs 60	Rs	0.060 "
		<u>Rs 2.592 "</u>
4. Less Over heads	Rs	4.026 "

Option (ii)

1. 2400 Tonne @ Rs. 2000		Rs. 4.8 Million
2. Savings on weight	Rs.	0.264 "
3. Labour Savings	Rs.	0.120 "
		<u>5.184 "</u>
4. Less Over heads		4.026
		<u>1.158 "</u>
Profits		1.158 "

If not for the incidental benefits of weight and labour savings, option (i) is lost option. Hence it is not economically worthwhile

Option (ii) leads to an annual profit of Rs. 1.158 millions. On this basis which is very favourable.

4.4 = D.C. Manufacturing Process

(See also annexure No.4 for the flow diagram of D.C. Processing)

The processing as shown in a diagrammatic form in the annexure. The wet area of the factory where high labour intensive operations of Hatcheting and Parings take place. The dry area of the factory involves more capital intensive operations such as the disintegrator, sterilizer and Drier.

(A) Dessicated coconut is the dried, shredded white kernel of fresh coconuts, processed under strict hygienic conditions for human consumption. It retains the original oil and protein of the fresh nut. Four standard grades, based on particle size, are generally produced - extra fine, fine (also known as macaroon) medium and coarse.

The product is also available in a number of speciality "fancy cuts" such as flake and shred. The bulk of DC production enters international trade and is mostly used in the confectionery and bakery industries.

The process entails the complete removal of the shell and testa from dehusked mature coconuts, disintegration of the white kernels, sterilizing, drying, sifting and packing the shredded meat. The product must be white in colour, crisp and with the taste of fresh coconut. Users have laid down rigid quality standards covering moisture content (3% maximum), colour, particle size limits and absence of off flavours, foreign odours, extraneous matter and bacterial contamination, in particular salmonella species which can cause gastro enteritis in humans. It cannot be over emphasised that factory hygienic and cleanliness and strict quality control, are two vitally important elements for a successful DC industry, particularly for a new produce with a reputation for reliability and quality to establish.

4.5 = Standardisation of the product

DC Product is manufactured Sri Lanka standards prepared by joint collaboration of Codex Committee on food hygiene of the joint FAO/WHO Codex Alimentarius Commission and Central Public Health Laboratory of London and Bureau of Sri Lanka Standards (SLS 98 - 1988)

Appearance : The colour of D.C. shall be natural white and shall for all grades, not greater than 0.2 red, 0.7 yellow and 0.1 blue on the Lovibond.

Taste and Smell: The taste and smell of the DC should be sweet and pleasant. It shall be free from chessy, smoky, soapy, sour or other undssirable flavour.

DC shall be free from extraneous matter.

Chemical Requirements: DC shall comply with the requirements given below when tested in accordance with the method prescribed in (SLS 98 - 1988).

Chemical requirements of DC

Sl No.1	Characteristic	Requirement
(1)	(2)	(3)
(i)	Moisture, per cent by mass, max.	
(a)	For standard granular grades	3.0
(b)	For special cuts	3.5
(ii)	Oil content, per cent by mass, min.	68
(ii)	Acidity, as lauric acid, per cent by mass, max.	0.3

Microbiological limits

Sl No	Test organism	n	c	Limit m	per gram M
(1)	(2)	(3)	(4)	(5)	(6)
(i)	Aerobic plate count	5	2	10^4	10^5
(ii)	Yeasts and moulds	5	2	100	200
(iii)	Coliforms	5	2	10	100
(iv)	Salmonella	5	0	0	-

Where,

- n = number of sample units to be tested ;
- c = maximum allowable number of sample units yielding values between m and M;
- m = limit under which a count is acceptable for any sample unit ;
- M = limit above which a count is unacceptable for any sample unit.

Packing :

DC shall be packed at the point of manufacture in 5 - ply kraft paper bags with an inner lining. The lining shall be heat sealed along the entire width of the bag to ensure complete sealing. The kraft paper bag shall be machine stitched.

DC shall be processed, packed, stored, and transported under very hygienic conditions.

4.6 = Plant and Machinery

(See annexure No.5 for CDA suggested specification for important machinery)

Wash Conveyor :-

Stainless steel construction, screw conveyor, inclining. Approximate 40 ft. in length, fitted to the pre-cutter at the receiving end. Feeding and opening into the sterilizer tank hopper.

Fitted with 12 water sprayer nozzles with through put of 20 gallons per hour (each)

Pre Cutter:-

Stainless Steel construction continuous operation to slice whole coconut to 6 - 10 pieces avoiding maceration of material.

Sterilizer Tank:-

Stainless/Steel construction. Water to be heated by steam, direct injection / steam jacket. Water to be raised to and maintained at 100 deg C. Provided with an inclined screw conveyor and a hopper to feed into the conveyor.

Cutter:-

Phillippine type devil disintegrator.

Conveyor Feeder:-

Stainless Steel construction. Washable hygenic design to convey disintegrated meat from the cutter and to feed the drier at a regular rate.

Vibro fluid Bed Dryer:-

600 Kg Hour Capacity two drying regimes of high and low temperatures. Installation with fine collectors.

Conveyor Feeder (Inspection):-

Food grade belt conveyor fed by a hopper to convey the material into a suitable feeder to the screening machine

Rotex Screening Machine:-

01 tonne per hour capacity with 3 devices, fitted with magnetic devices to separate metal pieces.

Vibro Packer :-

Vibro packer for the vibration of DC bags to settle the particles for packing with minimum air space.

Boiler and Heat Exchanger :-

Bioler and Heat exchanger specifications to be drawn up depending on the requirements of the drier and sterilizer.

Civil Construction :-

Foundations and mounting stages for the drier sterilizer, screening machines, vibro packer etc.

4.7 Bye products :-

Parings oil production capacity

Parings crushing capacity per hour = 350 kg.
Operating hours per shift = 10 Hours.
No. of working days per year = 200 days.
Crushing capacity per year = $350/1000 \times 10 \times 200$ x10 x200
= 700 mt

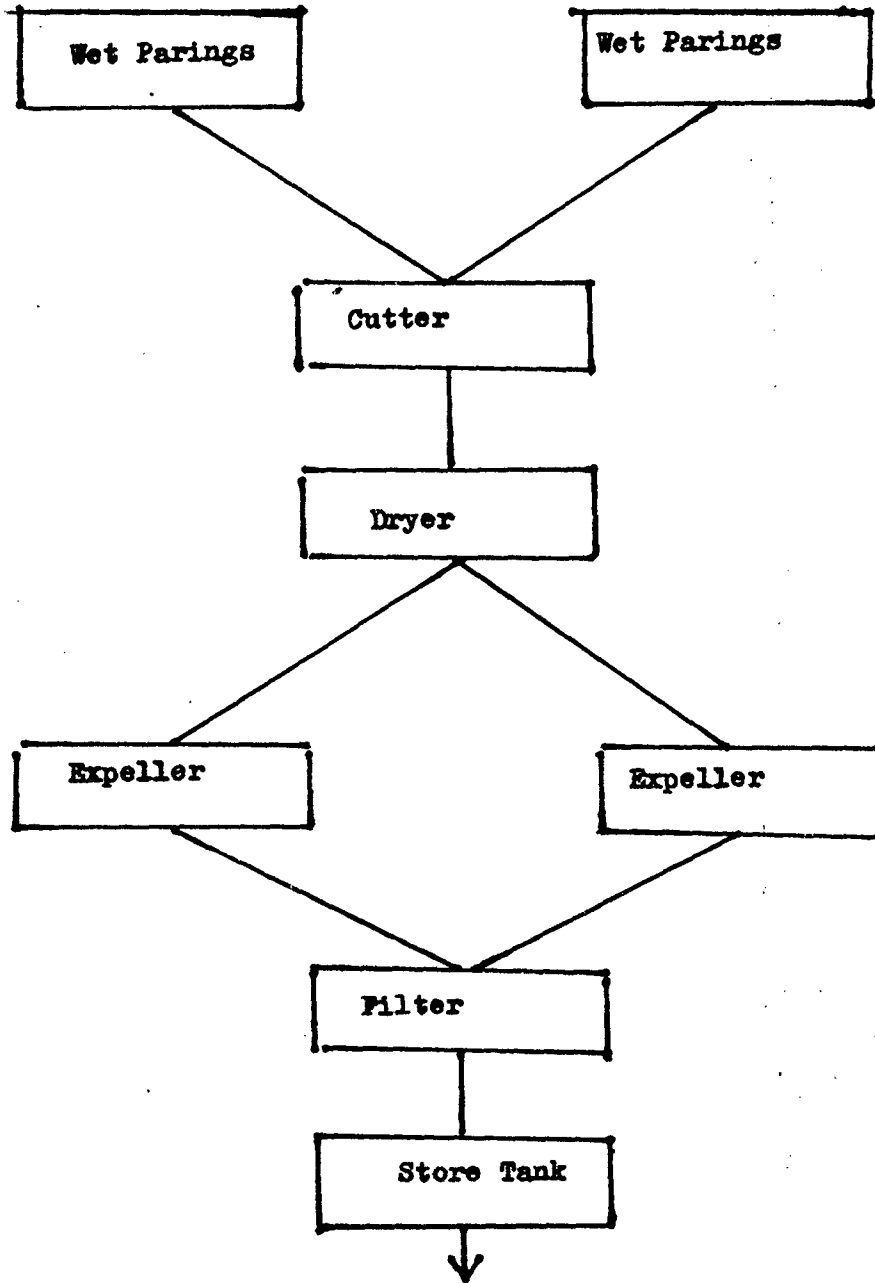
Average outturn per 1000 Kg. of parings = $1000 \times 1000/1750$
= 572.42 Kgs oil

Annual production of oil = $7000000 / 1750$
= 400 mt of oil

Laundry Bar Soap Manufacturing capacity

Soap manufacturing capacity per day = 500 Kg.
No. of working days per year = 200 days.
Annual soap manufacturing capacity = $500 \times 200 / 1000$
= 100 mt. of soap

FLOW DIAGRAM OF THE PARINGS OIL
PROCESSING



CHAPTER 5 : ORGANISATION AND MANAGEMENT

(See also Annexure No.6)

5.1 Structure of the management and organisation

(a) General body

The Supreme body of the society is the general membership. The power of the general body are as follows:-

- (i) Appointment of the Board of Directors
- (ii) Planning, financial arrangements of the Society.
- (iii) Revising the Society Bye-Laws after covering approval of the Co-operative Registrar.
- (iv) Overlooking the work of the Board of Directors and looking into complaints against the Board.
- (v) Deciding the maximum amount of the loan to the members.

The general body must meet at least once a year to discuss the annual audit report with the members.

(b) Board of Directors

The general body has the power to elect nine members to the Board of Directors. The Board of Directors are collectively and individually responsible to the General Body. Board of Directors meet once a week.

The powers and responsibilities of the Board of Directors are as follows:-

- (i) To act according to the laws, rules and regulations of the Department of Co-operative Development.
- (ii) To take policy decisions according to the bye-laws and the working rules of the society.
- (iii) Controlling the management of the Society.

(c) Management Staff

The General Manager is the Chief Executive with regard to the paid staff. The following Sections are directly under the control of the General Manager.

- (1) Production Section
- (2) Accounts Section
- (3) Administrative Section

Each section head will assist the General Manager in organising the work. The clerical staff, Supervisory staff and the Minor Staff will be managed by the Section Heads.

5.2 = Task of Each Section

Production Section

- (i) Production Planning & Procurement
- (ii) Transportation
- (iii) Processing , DC, Copra, Oil, Soap
- (iv) Marketing
- (v) Quality Control
- (vi) Control of workers.
- (vii) Plant & Machinery maintenance and repair.

(2) Accounts Section

- (i) Control of finance
- (ii) Payments and collection of money
- (iii) Budgeting
- (iv) Outlets Sales

(3) Administration

- (i) Co-ordination with members and Board of Directors.
- (ii) Planning & Implementation
- (iii) Office Administration
- (iv) Advertisement
- (v) Control of Stores
- (vi) Welfare and Extension work

5.3 Number of Personnel Required

	Tech.	Adm.	Gen.	Total	Paym.
General Manager	-	01	-	01	Monthly
Manager	01	-	-	01	"
Accountant	01	-	-	01	"
Secretary	-	01	-	01	"
Quality Controller	01	-	-	01	"
Book Keeper	01	-	-	01	"
Cashier	-	-	01	01	"
Store Keeper	-	-	01	01	"
Clerks	-	-	01	01	"
Supervisors	06	-	-	06	"
Foreman	02	-	-	02	"
Peons	-	-	01	01	"
Office Labourers	-	-	01	01	"
Skilled Labourers	-	-	-	104	Piece Rt
Unskilled Labourers	-	-	-	46	"
Huskers	-	-	-	40	Contract

212
=====

CHAPTER 6 : FINANCIAL ANALYSIS

Assumptions

The feasibility of the modernisation programme is worked out under the following assumptions :--

It is expected that after the proposed modernisation, the DC factory unit would be processing 96000 coconuts per day and 200 working days per annum (16,66 days per month)

Procurement price of coconuts F.A.Q. Rs 2500/- per thousand nuts. Average out-turn of DC per 1000 nuts = 125 kgs.

Average sales price per kg. of upgraded quality DC = Rs26/50

By products out-turn and income: Parings 80 lbs or 36.4 kgs for 1000 nuts

Coconut shells: 1000 shells at Rs. 250/-

6.1 Total Project Outlay (Capital investment Rs. million)

(a) Existing items to be used

(i)	Land	..	..	9.350	
(ii)	Buildings	..	.	3,750	
(iii)	Plant & Machinery	..	..	1,364	
(iv)	Vehicles	..	..	1,250	
				-----	15,714

(See also annexure No. 7)

(b) New items to be purchased

(i)	Plant & Machinery	..	..	10.450	
(ii)	Other equipments	..	..	1.280	
(iii)	Installation Charges	..	..	0.547	
(iv)	Civil Construction	..	..	0.500	
(v)	Vehicle (Land Master with Trailer)	..	..	0.120	
				-----	12.897
(c)	Pre-operative cost	..	..	1.925	1.925
(d)	Margin money for working Capital (one month)	..	..	1.968	1.968
(e)	Contingency	..	..	2.496	2.496
					----- 35,000 =====

6.2 Sources of Funds

		(Rs Million)
(a) Total Capital Requirement		35,000
(b) Owned by the society Cap.	15.714	
(c) Income from scrap items	0.472	
(d) Member's contribution from mill develop. fund (grant)	0.280	
(e) Govt. contrib. Coconut Dev. Authority (grant)	9.600	
(f) Additional Capital Requirement from bank/funding agencies	17.934	
	-----	-----
	35,000	35,000
	=====	=====

6.3 Total Variable Cost per year

(a) Main product DC (see also annexure No.8)		
variable cost per Kg	26.70	
Variable cost per year	$26.70 \times 96 \times 125 \times 200$	
		= 64.080
		=====
(b) By products variable cost per 1000 kg. of Parings oil (exclusive raw material cost)		
		= $2835 \times 65 / 100 = 1843$
variable cost per day		= $1843 \times 3500 / 1000 = 6450$
variable cost per year		= $6450 \times 200 = 1.290$
		=====
(c) Variable cost per 600gms. Bar Soap		= 18.70
Variable cost per Kg. of Soap		= $18.70/600 \times 1000$
		= 31.17
Variable cost per year		= $31.17 \times 500 \times 200$
		= 3.117
		=====
Total variable cost		= $64.080 + 1.290 + 3.117$
		= 68.487
		=====

6.4 Total Fixed cost per year

Fixed Cost per Year = 1.555
(see annexure 9) =====

6.5 Total Sales per year

DC 26.50 x 125 x 96 x 200 = 63.600
Parings Oil = $25 \times 65 / 100 \times 3500 \times 200$ = 11.375
Poonac = $4 \times 30 / 100 \times 3500 \times 200$ = .840
Sediments = $1.5 \times 53500 \times 100$ = 0.053 12.268
Coconut shells = $96000 \times 250 \times 100 \times 200$ = 4.800
Bar soap = $22.50 / 600 \times 1000 \times 500 \times 200$ = 3.750

84.418
=====

6.6 Pre-operative cost

Wages and salaries = .312
Travelling = .030
Postage Telephone Charges = .015
Stationery = .005
Insurance = .012

.374

Interest on term loan during
the commissioning period
8 months - $12.897 \times 8 / 12 \times 19 / 100$ = 1.633

2.007

Less Interest from
scrap item = $.472 \times 19 / 100 \times 11 / 12$ = .082

1.925
=====

6.7 Margin money for working capital (One Month)

DC = $64.080 \times 30 / 100 \times 1 / 12$ = 1.602
Parings Oil = $1.290 \times 1 / 12$ = .107
Bar Soap = $3.117 \times 1 / 12$ = .259

1.968
=====

6.8 Loan Repayment Schedule

Year	Loan outs:	Instal.	Interesr @ 19%
0	17.934	-	-
1	16.137	1.797	3.407
2	14.344	1.793	3.066
3	12.551	1.793	2.725
4	10.758	1.793	2.385
5	8.965	1.793	2.044
6	7.172	1.793	1.703
7	5.379	1.793	1.363
8	3.586	1.793	1.022
9	1.793	1.793	.681
10	1.793	1.793	.340

6.9.1 Pay -back period : 3 Yrs. 8 Mts.

6.9.2 Break even capacity : TFC

TR - TVC

: 5.581

84,418 - 68.487

: 5.581

----- x 100

15.931

BEC : 25 %

=====

6.9.3 Death Service Coverage

Ratio = Intern. gener. Fund

Loan Instalment Fund

= 9.581

1.793

DSCR = 5,3

=====

6.9.4 Benefit - Cost Ratio = Total present Value

Tot. Cap. Investment

= 59.284

35.000

BCR = 1.69

=====

6.9.5 Int. Rate of Return	=	59.284 - 35.000 - 24.284		
	=	39.202 - 25.000 - 4.202		
	=	24.284 - 4.204 = 20.082		

		25 - 15	10	
	=	20.082	=	2.008

		10		
	=	4.202	=	2.09

		2.008		
	=	25 + 2.09		
IRR	=	27.09 %		

6.9.6 Increasing income to producers

* Net Surplus	=	6.487 (Rs. Million)	
* For Reserve fund 25%	=	1.621	

* For Dividend	=	4.866	
* Increase in income to farmers per 1000 coconuts	=	4.866,000	

		96 x 200	
	=	Rs. 253.00	
		=====	

6.9 Financial Analysis.

(See annexure No. 13)

6.10 Sensivity Analysis

(See annexure No.14)

CHAPTER 7 : BUDGET

The budget for the first five operating years

(Rs. Million)

Item	Operating Years				
	01	02	03	04	05
1 Capacity Utilisation	50%	75%	100%	100%	100%
2 Total Sales	42.209	63.313	84.418	84.418	84.418
3. Total Variable Cost	34.243	51.365	68.487	68.487	68.487
4. Int. on long Term Loan 19%	3.407	3.066	2.725	2.385	2.044
5. Depression	1.642	1.460	1.301	1.162	1.039
6. Fixed Cost	1.555	1.555	1.555	1.555	1.555
7. Total Fixed Cost	6.604	6.081	5.581	5.102	4.638
8 Surplus	1.362	5.867	10.350	10.829	11.293
9 Tax @ 20%	0.272	1.173	2.070	2.165	2.258
10. Surplus after tax	1.090	4.694	8.280	8.664	9.035
11 Annual Loan Instalment	1.787	1.793	1.793	1.793	1.793
12 Net Surplus (After Re-payment of loan Instalment	0.707	2.901	6.487	6.871	7.242
13 Cumulative Surplus	0.707	2.194	8.681	15.552	22.794

CHAPTER = 8 = SOCIAL BENEFITS OF THE PROJECT AND RECOMMENDATIONS

8.1 - Social Benefits

- (i) By improving the quality of the DC, we will be able to induce the world market to get a good price for the DC
- (ii) The modernisation of the DC Mill will result in economic benefits to coconut growers as well as to the workers. The Co-operative Society will be able to pass on the advantage of the premium price it will receive for improved quality of DC to the coconut growers, with the resulting increase in income the growers will be able to pay reasonable wages to the workers in the estates. The Society will also be able to enhance payment to its employees.
- (iii) Sri Lanka can earn Foreign Exchange through this project.
- (iv) By increasing the income of coconuts in two ways :-
 - (a) A better price for the coconuts by an increase of about 25 %
 - (b) An additional dividend of 12% from the net surplus
- (v) By building a reserve fund for the Society by about Rs. 1.621 million per year from the net surplus

8.2 - Recommendations

1. All personnel including labourers should be well trained in the appropriate disciplines and practices for better management of the new set up
2. The adaptation of waste heat technology for the boilers has to be considered in the light of energy saving, furthermore solar power energy system also could be incorporated into the new set up.
3. The site and the area should be improved to meet the requirements of a modern food factory located in pleasing surroundings.
4. The management should inculcate the principle of quality improvement and maintenance of every worker in the factory through dialogue, lectures incentives etc. The practice 'quality Circles' as in Japan should be aimed at. This requires a sense of commitment and discipline yet to be achieved. Everybody should realose, the available options such as :-
 - (a) Maintenance of improved quality level
 - or
 - (b) Market oblivion

List of Annextures.

- Annexure No. 1 - Coconuts : Industry
- No.2 - Cost of production and farmers margin per acre
- No.3a - Events and Activities in the Project Plan of Establishment Schedule
- No.3b - Time estimated table and network diagram.
- No.4 - Flow diagram of DC Process
- No.5 - New Plant & Machinery, and other equipment to be purchased.
- No.6 - Structure of the Organisation and Manpower Chart.
- No.7 - Capital Investment owned by the Society.
- No.8 - Variable cost per annum.
- No.9 - Fixed cost per annum
- No 10 - Computation of depreciation
- No.11 - Map of Sri Lanka: Kammal Pattu Administrative Region.
- No.12 - Suggested Specifications for important Machinery
- No. 13 - **Financial Analysis**
- No. 14 - **Sensitivity Analysis**

Annexure No.1

COCONUTS		INDUSTRY		
Item	Unit	1987	1988 *	1989 +
1. production	Mn.Nuts	2351	1936	2436
1.1 DC	-do-	350	155	318
1.2 Coconut Oil	-do-	573	276	597
1.3 Copra	-do-	44	29	41
1.5 Domestic Nut Consumption	-do-	1398	-1449	1477
2. Average Export Price (F.O.B.)	Rs/Nut	2.64	4.00	3.35
3. Cost of Production	-do-	0.73	0.81	0.85

* Revised

+ Provisional

Source : Central Bank Report.

Annexure No.2

Cost of Production And Farmers Margin per Acre

Item	Rs.
1. Fertilizer	
(i) Fertilizer @ 3 Kgs / Palm	- 676.00
(ii) Transport & Application	- 225.00
2. Picking, Collecting, Counting (at 300 nuts per acre)	- 200.00
3. Control of pests, diseases, and weeds	- 200.00
4. Other cultural practices	- 400.00
5. Maintaining roads, fences etc.	- 80.00
6. Overheads	- 660.00
7. Return at Rs. 2/- per fnut	- 6000.00
8. Producer's margin	- 3559.00

(Source: Coconut Development Authority.)

Annexure No.3a

Events and Activities in the Project Plan
of Establishment Schedule

(a) Project Time Schedule

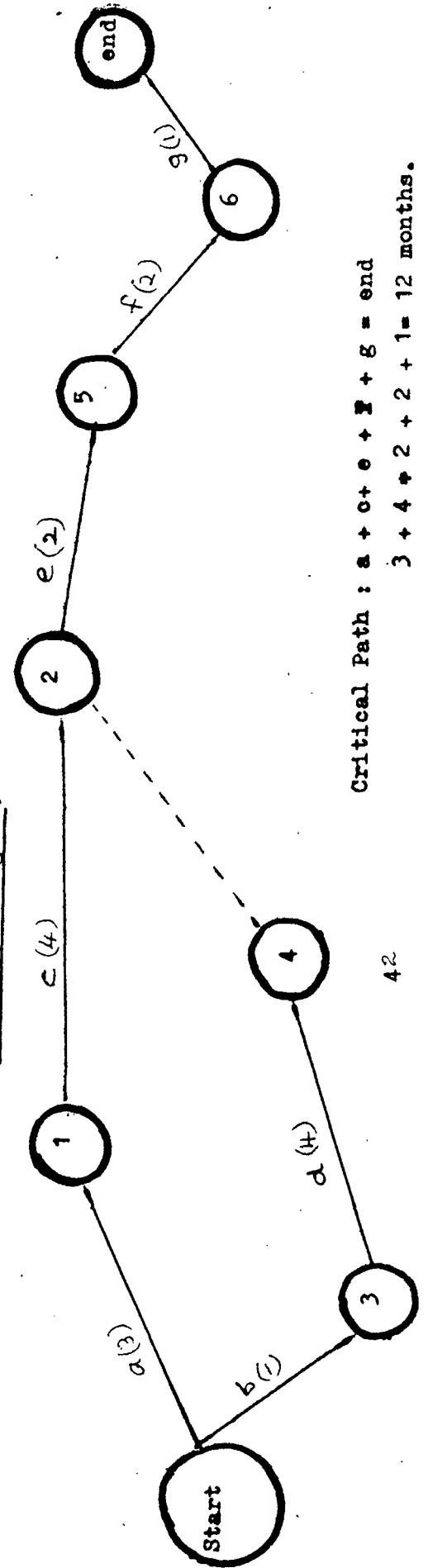
Activities	Time reqr:	Predestinate
a. Funds raising	03	-
b. Disposal of equipment not needed	01	-
c. Ordering and Acquisition of new equioment	04	a.b
d. Alteration of existing buildings	04	b
e. Electrification	02	a,b,c,d.
f. Plant & Machinery installation	02	d,e
g. Trial runs	01	f

b) Time estimated Table.

Annexure No. 3b.

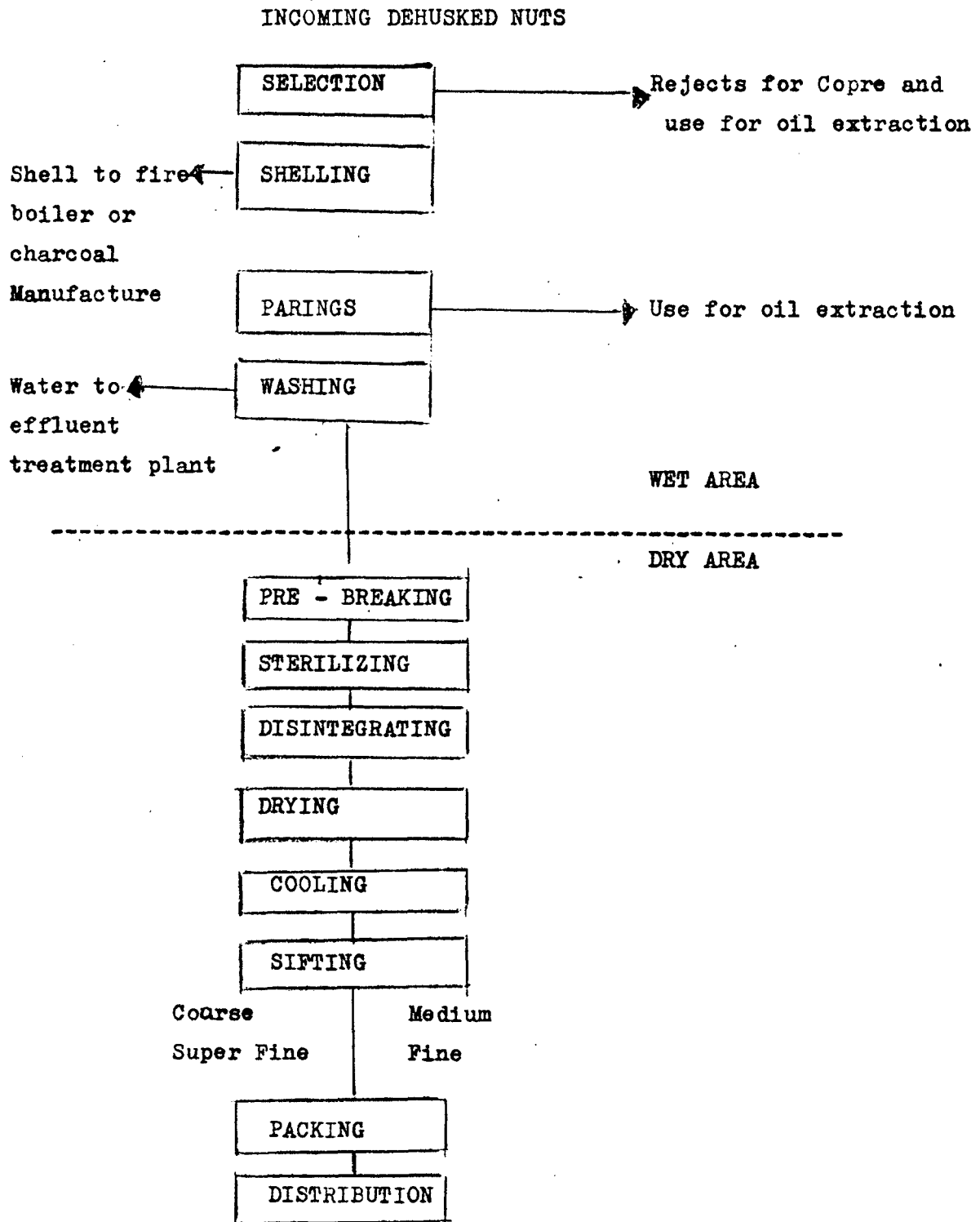
activity	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
a		██████████										
b	██████████											
c			██████████									
d		██████████										
e				██████████								
f							██████████					
g								██████████				

c) Net work diagram.



Critical Path : a + c + e + f + g = end
 $3 + 4 + 2 + 2 + 1 = 12$ months.

FLOW DIAGRAM OF DESSICATED COCONUT PROCESS



Annexure No. 5

NEW PLANT AND MACHINERY TO BE PURCHASED

(a) Special Plant & Machinery (suggested by C.D.A)

Item	Est. Cost	H.P. Req.
1. Wash Conveyor	Rs. 500,000	4.0
2. Pre Cutter	100,000	1.0
3. Sterilizer Tank	600,000	0.5
4. Philipino -Type Cutter	450,000	20.0
5. Conveyor Feeder	500,000	3.0
6. Vibro Fluid Bed Dryer	5000,000	30.0
7. Conveyor Feeder (insp)	200,000	3.0
8. Screening Machine	1000,000	5.0
9. Vibro Packer	100,000	3.0
10. Boiler & Heat Exchanger	2000,000	5.0
	-----	-----
	Rs 10450,000	74.5
	Rs 10.450 (Million)	

(b) Other equipments

Item	Model/Capacity	Unit	Est. Cost
1. Stainless Steel Washing Tank	8' x 3'	04	Rs.100,000
2. Stainless Steel Parings ank	100' x 1'	01	100,000
3. Deshelled C'Tank	8' x 3'	04	100,000
4. Cooling Table	8' x 8'	03	80,000
5. Waste Heat Unit	10,000 C'shells	03	600,000
6. Power Transformer	125 KVA	01	300,00

		Rs	1280,000
		Rs Mn.	1.280

SUB COMMITTEES (03 x 03)

PRESIDENT (01)

GENERAL MANAGER (01)

SECTION
ANT (01)

PRODUCTION SECTION

MANAGER

ADMINISTRATION SECTION

SECRETARY (01)

BOOK
KEEPER (01)

ACCOUNT
CLERK (02)

QUALITY
CONTROLLER (01)

DC MILL

COPRA KILN
&

OIL MILL

SOAP SECTION

TRANSPORT

DRIVERS (03)

CLEARNERS
(03)

PRESIDENT & BOARD OFFICER ADM
OF DIRECTORS WORK

WET AREA

DRY AREA

SUPERVISORS (02)

SUPERVISORS (02)

PROCUREMENT SECTION
SUPERVISOR (01)

SUPERVISOR (01)

OIL MILL

SOAP SECTION

SKILLED LABOURS
(03)

UNSKILLED
LABOURS
(05)

OFFICE

GENERAL CLERK (01)

STO

LABOURS

UNSKILLED LABOURS
(06)

SKILLED
LABOURS
(10)

UNSKILLED
LABOURS
(08)

STO

STEAM HEAT UNIT

FORMAN (02)

SKILLED LABOURS
(80)

UNSKILLED LABOURS
(20)

SKILLED LABOURS
(01)

UNSKILLED LABOURS
(02)

PEON
(01)

LABOUR
(01)

STO
(C)

COPRA KILN

PROCUREMENT SECTION

Annexure No. 7

Capital Investment owned by the Society

(A) Land

Toatl Acreage	..	..	4 Acs. 2 Rds. 10 P.
D.C. Factory Area	..	..	2 " 2 " 10 P.
Present market value per Perch	..	..	Rs 15,000/-
Value of the D.C. Factory Area			
160 x 2 + 40 x 2 + 10 = 410	..	..	410 x Rs 15,000/- = Rs 61,50,000.00
Fresh Coconut Storage Area	..	..	2 Acres
Present market value per perch	..	..	Rs 10,000/-
Value of the fresh coconut store area			
(160 x 2 = 320)	..	..	320 x Rs 10,000/- .. Rs 32,00,000.00
Total value of the land	..	..	Rs 61,50,000 + 32,00000 .. Rs 93,50,000/- .. Rs 9.350 (Million)

(B) Buildings

Factory Buildings	..	..	10,000 Sq. Ft.
Stores	..	..	3,000 "
Adminstration Block	..	..	2,000 "
			<hr/> 15,000 "
At the rate of 1 Sq. Ft	..	..	@ Rs 250/-
Total value of the Buildings	..	..	15,000 x Rs 250/- = Rs 37,50,000/- = <u>Rs 3.750 (Million)</u>

Annexure No. 8

Variable Cost per Annum

Variable Cost per Kg. of D.C

Coconuts (Rs2/50 x 8)	..	..	Rs 20.00
Wages	..	..	4.00
EPF/ETF	..	..	0.52
Machinery Repairs	..	..	0.18
Electricity	..	..	0.18
Transport (FN/DC)	..	..	0.40
Brokerage	..	..	0.26
Cess	..	..	0.30
Levy	..	..	0.26
Packing	..	..	0.13
Rejections	..	..	0.13
Contingency	..	..	0.34
			Rs <u>26.70</u>

Variable cost per year = Rs 26/70 x 96 x 125 x 200 = Rs 64.080

Annexure No. 9

Fixed Cost Per Annum

Holiday Wages	..	..	Rs 140,000
Mercantile Holidays	..	..	85,000
Retirement Gratuity	..	..	60,000
Welfare Ameneties	..	..	12,000
Medical Assistance	..	..	15,000
Tax (Assessment)	..	..	4,000
Electricity	..	..	20,000
Insurance	..	..	100,000
General Expenses	..	..	60,000
Incentive Payment (Labourers)	..	..	175,000
Transport	..	..	70,000
Staff Salaries	..	..	432,000
E.T.F. Payments	..	..	28,000
Incentive (Staff)	..	..	40,000
Overtime Payments	..	..	24,000
Subsistance	..	..	19,000
Holiday Payments	..	..	3,000
Chairman/Secretary Allowances	..	..	38,000
Director 's Expenses	..	..	24,000
Welfare facilities	..	..	16,000
A.G Meeting expenses	..	..	8,000
Member's welfare expenses	..	..	12,000
Stationery	..	..	36,000
Telephone Charges	..	..	14,000
Legal expenses	..	..	16,000
Laboratory expenses	..	..	36,000
Uniform/Refreshments for Labourers	..	..	20,000
Contingencies	..	..	48,000
			Rs <u>1,555,000</u>

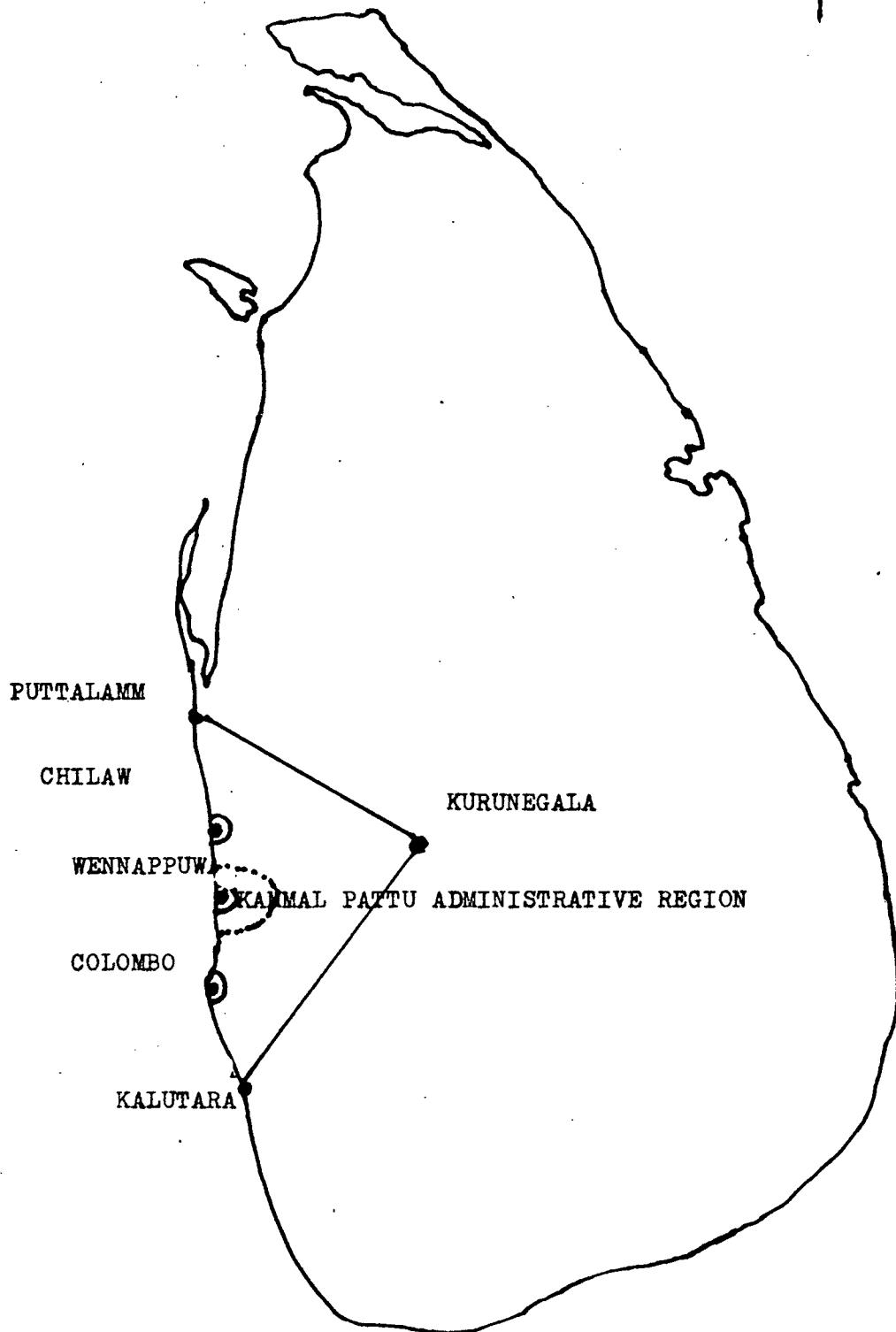
Annexure No. 10

Computation of Depreciation

Year	Buildings @ 5%		Plant & Machinery @ 10%		Vehicles @ 20%		Total annual depreciation
	Value	Depreciation	Value/Depreciation	Value/Depreciation	Value/Depreciation	Value/Depreciation	
0	3.750	-	11.814	-	1.370	-	-
1	3.563	.187	10.633	1.181	1.096	.274	1.642
2	3.385	.178	9.570	1.063	.877	.219	1.460
3	3.216	.169	8.613	.957	.702	.175	1.301
4	3.055	.161	7.752	.861	.562	.140	1.162
5	2.903	.152	6.977	.775	.450	.112	1.039
6	2.758	.145	6.280	.697	.360	.090	.932
7	2.620	.138	5.652	.628	.288	.072	.832
8	2.489	.131	5.087	.565	.231	.057	.753
9	2.362	.124	4.579	.508	.185	.146	.678
10	2.244	.118	4.122	.457	.121	.037	.612
Salvage Value	2.244		4.122		.121		

Total Salvage Value = Rs 6.487 (Million)

MAP OF SRI LANKA.



COCONUT TRIANGLE:

PUTTALAM - KURUNEGALA - KALUTARA.

Suggested Specifications for Important Machinery

(a) Disintegrator

Capacity : 500 lbs/hour (wet)

Material : All parts of machinery (excluding cutter 7 rings) which come into contact with coconut meat must be made of as far as possible, food grade stainless steel.

Model/Suppliers : (1) Startech Contractor INC
3587, Lingaywn Street,
STA. MESA,
Metro Manila,
Philippines.

(2) Ferro Trading Ltd.,
509 1/1 Bullers Road,
Colombo 8.

(b) Sifter:

Capacity : 1 Tonne/hour

Material : Stainless Steel/Aluminum.

Model/Supplier : 3 desk/Model No: Locker.

Ferro Trading Ltd.
509 1/1, Bullers Road,
Colombo 8.

(c) Dryer*:

Capacity: 600 Kg/hour.

Material : (as per disintegrator)

Model/Suppliers : Kilburn VFBD
Kilburn Division
Macneill & Magro Ltd.
P.O. Box 565
Mackinon Mackenzie Building,
Shoorji Vallabhdas Mang.
Bombay 400 038
India.

Years		01	02	03	04	05	06	07	08	09	
Utilisation		50%	75%	100%	100%	100%	100%	100%	100%	100%	100%
Variable Cost		42.209	63.313	84.418	84.418	84.418	84.418	84.418	84.418	84.418	84.418
on Loans @ 19%		34.243	51.365	68.487	68.487	68.487	68.487	68.487	68.487	68.487	68.487
ion		3,407	3,066	2,725	2,385	2,044	1,703	1,363	1,022	.681	
Cost		1.642	1.460	1.301	1.162	1.039	.932	.832	.753	.678	
ed Cost (4 + 5 + 6)		1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	1.555	
- 3 - 7)		6.604	6.081	5,581	5,102	4,638	4,190	3,750	3,330	2,914	
ter tax (8 - 9)		1.362	5.867	10.350	10.829	11.293	11.741	12.181	12.601	13.017	
value		.272	1.173	2.070	2.165	2.258	2.348	2.436	2.520	2.603	
value generated fund (11)		1.090	4.694	8.280	8.664	9.035	9.393	9.745	10.081	10.414	
inflows for P/NPV/IRR		-	-	-	-	-	-	-	-	-	2
Cash inflow		2.732	6.154	9.581	9.826	10.074	10.325	10.577	10.834	11.092	3
d factor at 15%		6.139	9.220	12.306	12.211	12.118	12.028	11.940	11.856	11.773	3
d present value at 15%		15.359	27.665	39.876	51.994	64.022	75.962	87.818	99.591	13	
ital Investment		0.8696	0.7561	0.6575	0.5718	0.4972	0.4223	0.3759	0.3269	0.2843	
nt value at 15%		5.388	6.971	8.091	6.982	6.025	5.199	4.488	3.875	3.347	
Factor at 25%		-35.000	-28.861	-19.641	-7.335	+ 4.876					

(Monthly figures)

Changing price per kg of;

(Rs. Million)

	DC	By-products	Total
	22.32	23.85	25.17
	26.50	27.82	29.15
	30.47	29.15	30.47
	7.37	7.80	8.24
	8.67	8.67	8.67
	9.54	9.11	9.54
	9.97	9.54	9.97
	29.89	31.65	33.41
	35.17	35.17	35.17
	38.69	36.93	38.69
	40.44	36.93	40.44
	-15%	-10%	-5%
	0	+5%	+10%
	+15%		+15%

Production kgs. per month:

169932	-15%	-1.039	1.950	4.942	7.933	10,924	13.915	16.88
179928	-10%	-0.903	2.263	5.430	8.597	11.764	14.930	18.06
189924	-5%	-0.767	2.575	5.918	9.261	12.604	15.946	19.27
199920	0	-0.631	2.887	6.406	9.925	13.443	16.962	20.46
209916	+5%	-0.495	3.199	6.893	10.588	14.283	17.977	21.65
219912	+10%	-0.359	3.511	7.382	11.252	15.123	18.993	22.84
229908	+15%	-0.223	3.823	7.869	11.915	15.962	20.008	24.03

Total Fixed Cost : $\frac{5,581,000}{16.66} = \text{Rs. } 334,993/-$

Average Variable Cost : $\frac{68,487,000}{125 \times 96 \times 200} = \text{Rs. } 28.53$

Total Revenue = 84,418,000

Average Revenue : $\frac{84,418,000}{125 \times 96 \times 200} = \text{Rs. } 35.17$

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: FEED MIXED MILL
<i>COUNTRY</i>	: THAILAND
<i>PROJECT PREPARED BY</i>	: MISS MAROOM SUTANUN

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

ICA Management Training Project for Agricultural Co-operatives in Asia

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ACKNOWLEDGEMENT

Feed MIXED MILL IN ROUNGWANG AGRICULTURAL COOP

The feed mixed mill project in Rongkwang Agricultural Cooperative is a part of the fifth ICA Training Course for Strengthening Management of Agricultural Cooperatives in Asia which is organized from October 22, 1990 to May 10, 1991 in New Delhi, Bangkok, Tokyo and Seoul. During the training course it has given me a good chance to associate with many friends who are working in the field and I have learnt various aspects of cooperative management and integrated approach from professors of Indian Institute of Management (I.I.M) The feed mixed mill in Rongkwang Agricultural Cooperative was prepared under this program.

I would like to thank Rongkwang Agricultural Cooperative and the cooperative league of Thailand for nominating me to the training course and extending me all the support.

I am grateful to the I.I.M Professors for their giving valuable information in cooperative management and also Mr. M.V. Madane, Project Director for his great help.

Marom Sutanun

February, 1991, Bangkok.

CHAPTER 1

SUMMARY

- 1.1 This project focus on establish a processing plant for feed mixed mill. The project will be operated by Rongkwang Agriculurul Cooperative which is located in Rongkwang District of Phrae Province in the north of Thailand which is about 551 kilometres for from Bangkok;
- 1.2 The project objective is to increase income of the cooperative's members.
- 1.3 The project life is 11 years.
- 1.4 The project components are cousis of farm guidance, credit, input supply, procuremant, processing and marketing but it is emphasized on procuremant, processing and marketing.
 - a) Procurement: The cooperative will procure corn and soybean form the member 2,604,000,000 kgs (2,640 tons) per year (1989/1990) which account for 60 percent of the total production in the area and the cooperative will set price higher than market price.
 - b) Processing: Feed mixed mill of the project will use corn and soybean meah as main raw material mixed Fish meal, Dricaciam forfest, Sugar, Grude fat Salt and Frmixed. The capacity of the plant is 720,000 kgs (720 tons) of feed mixed mill per year.

- c) Marketing: At the beginning, the project product, Feed mixed mill will be serve the members demand in the cooperative, the rural area nearly in Distric and the Province.
- 1.5 The total investment cost is about 1,415,000 baht (^{US} 1=25 Baht) for land, building and machineries, The capital will be equity from the members and loan which should be from Bank Agriculture and Agriculture cooperative.

The fund of the project will be raised as follow:

Sources	Amount (Baht)
Member share	415,000
Loan	1,000,000
Total	1,415,000

- 1.6 The Financial Analysis shows project financially viable; the Benefit Cost Ratio (B/C ratio) is 1.17 Net Present Value (NPV) is 4,317,892 baht at the discount rate of 14 percent and Internal Rate of Return (IRR) is 38.98 percent. This project have Internal Rate of Return very high.
- 1.7 The project can increase the farmers income in livestock. The members sales corn and soybean which product is raw material in feed mixed mill.

CHAPTER II

BACKGROUND

2.1 Overall Situation

Rongkwang District is one of the 7 districts of Phrae province. This district is about 30 kms. from the town with population of 18,563 households or 72,546 persons which 27,023 are men, 20,660 are woman. There one a sub-districts and 43 village. About 70% of the area is forest and mountain. There are main water course flowing through Rongkwang district is Vume River, Macaomeme River. The major crops in Rongkwang District are paddy, soybean, corn, tobacco and field crops.

Occupation

Most of the population of Rongkwang District of the 18,563 households are engaged in Agriculture such as paddy, Fruit, field crops and livestock.

History of the cooperative Rongkwang Agriculture cooperative Ltd.

Rongkwang Agricultural Cooperative Ltd. was registered in 1975 by amalgamation of 3 credit cooperatives. The purpose of organizing these cooperatives was to provide credit to farmer which proved successful from the beginning but no progress made because of the limitation of funds and the smallness of business activity of the cooperatives. In person it has membership of 3,500 person which can be divided into 47 groups. The members are 2,500 men and 1,000 are woman.

Fix Assets cooperative have One rice storage of 500 tons, one building for the input supply section and Drying Field.

2313 Organization and Administration

The cooperative is comprised of all members who from the general meeting. The general meeting elects a board of directors, who are responsible for the formulation of cooperative policy and decision making as well as to appoint the manager of the cooperative. The manager will administer the entire operation under the advice and supervision of the board of directors. There are 15 committee members and 18 employees: 1 manager, 1 Assistant General Manager, 1 Accounting staff General, 1 Finance Staff,

- 5 Credit Staff
- 3 Marketing Staff
- 1 Farm Guidance Staff
- 1 General Affairs Staff
- 1 Watchmen
- 1 Guardman
- 2 Service Staff

The administration of Rongkwang Agricultural Cooperative Ltd. is divided in to 5 section as follows.

1. Administration section
2. Account and Finance section
3. Credit Section
4. Supply, Processing and Marketing section
5. Farm Extension section
6. Funeral Service Association

Rongkwang Agricultural cooperative Ltd. carries out the bussiness activities for the benefit of their members as follows:

1. Providing credit to members
2. Receiving deposit from members
3. Supplying agricultural inputs and consumption to members. (Ferlilizer, feed, Hand operatiel tractor)
4. Collecting members products and maketing
5. Providing farm extension serviced to the members
6. Providing welfare to the members and their families

Financial Status (as at 31 March 1990)

No of member 3,312

<u>Liabilities</u>	16,679,293.64	Baht
- Loan from BAAC	2,817,135.25	"
- Deposit from members	13,288,047.50	"
- Current liabilities	574,110.89	"
<- <u>Cooperative own fund</u>	21,885,022.11	"
- Share capital	12,933,500.00	"
- Reserue fund	7,184,006.72	"
- Other fund	1,767,515.39	"
- Profit before Distribution	2,140,815.84	"
- <u>Assets</u>	40,704,781.59	"
- Cash	215,031.28	"
- Account Receivable	38,366,466.00	"
- Current Assets	1,625,870.62	"
- Fixed Assets	497,431.69	"

2.2 Area of Project

Rongkwang Agricultural is located in Rongkwang district of Phrae Province in the north of Thailand which is about 551 kilometres far from Bangkok.

The cooperative area is about 11 rai. (1 rai = 0.4 acre)

The feed mixed mill project is located in the cooperative and the area can service the members 9 village in District and in Province.

a) Cropping Pattern

The main crops in area are paddy, soybean, corn and field crops which are grown in two crops. Out of this area is suitable for growing sugarcane, tobacco and cotton.

b) Cost of Production

Average cost of corn and soybean production in this area is 1,000 % per rai which the member get the yield about 200 kgs.

c) Marketing of Farmers' Produce

Most of the farmers' sell their products to the cooperative and the cooperative will store them in bran for a while and then sells them to private company in Bangkok but there are some members sell their products directly to local merchants. The members do not sell all of their products because they will keep some of them for seeding and consumption. Corn can sell at farm gate price about 2 baht per kg. and soybean can sell at farm gate price about 7.20 baht per kgs.

d) Livestock population. Consequently livestock population has increased remarkably (Appendix 1, 2

e) Marketing of Farmers' the feed

Most of the members and the farmers buy their feed from cooperative buy the feed from the company to the cooperative. (appendix 3, 4)

2.3 Problem Faced by Farmers

1. Feed is one of the most important farm inputs for farmers in Rongkwang District and the cooperative: In the year, the farmers are raising livestock, and income comes from livestock.

2. The feed have expensive price. The farmer buy their feed uncertain and sometime they produce low quality product as a result of hard competition.

3. In the cooperative there is 47 livestock group with 3,500 members. The members want to buy the feed from the cooperative.

2.4 Need and Justification for the Project

1. By establishing feed mill run by farmers' organization small farmers can purchases qualified feed in cheap price and get out of disadvantages caused by market segmentation of private producers. Also they can enjoy services including raising technique and veterinary service offered by their own organization.

2. The project is to increase of the cooperative members

3. The cooperative is collecting product from the members, which the price is certain because the production is Raw Material in feed mixed mill.

4. To promote the intergrated effort comprising guidance, credit, input supply, processing and marketing.

CHAPTER III

PROJECT

3.1 OBJECTIVES

The project objective is to increase the income of the cooperative's member. This objective will be achieved by promoting the following activities.

1. To establish a processing plant for making feed from corn and soybean.
2. To promote the intergrate effort comprising guidance, credit, input supply, processing and marketing.
3. To promote participation of membership.
4. To develop the capacity of the cooperative's management staff in carrying out its business activity.
5. Supplying qualified feed in reasonable price.
6. Strengthening guidance and extension service including raising technique and viterinary service.
7. Offering farmers better opportunity for off farm income
8. Return of profits to members earued through the operation of new business.

3.2 Area of Operation

The location of the processing plant will be located in Rongkwang District and in Phrae Province. It will be located next to the office of the Rongkwang Agricultural cooperative, which it has completed facilities such as warehouse, infrastructure. It is convenience to transport raw material to the plant, that will eninimize transport cost and it is convenience to management. There are the idial location for the plant. The operation of the plant will use corn and soybean from the cooperative area

and from another cooperative in Phrae Province. livestock raising scale in this cooperative and this District are rather smaller comparing with other district, that is main cause for poor services rendered by existing mills.

3.3 Project Components

3.3.1 Construction of Feed Mill.

1. The mill, with the daily capacity of 300 kgs per day. one year in construction for the cost of about 1,415,000 baht. The location of the mill would be near Rongkwang Agricultural Cooperative.

2. Construction will be determined in the project area in the consideration of transportation and the collection of raw materials in the feed mixed mill.

3.3.2 Procurement of Raw Material

Around 70-80 % of the total raw materials in the feed mixed mill will be procured in this area in the cooperative from foreign district and Province. Balanced 30%-20% will be purchased through merchant.

3.3.3 Processing

The feed mixed mill is comparatively simple, with basic equipment and facilities specially high skilled techniques are not necessary for processing.

3.3.4 Marketing Channel

Rongkwang Agricultural Cooperative have 47 group in the district, where farmers are purchasing feed. It is so fascinating selling outlet of feed for small farmers that even big producers are distributing their products through group members. So there is no need to establish new selling outlet

Agricultural Cooperative will transport most of feed from the mill to the member by their truck.

Selling price of the feed mixed mill will be same level with Company. And more than 20% of profit of the mill will be paid back to the member as patronage dividend.

3.3.5 Extension Service

The feed mixed mill will be strengthening guidance and extension service including raising technique and service for member farmers who are usually neglected from private.

CHAPTER IV
DETAILS OF OPERATIONS

4.1 Capacity of the Feed mixed Mill

Capacity of the feed mixed mill will be 300 kgs/8 working hours per day in order to meet the Need of member farmers in the district and in the province. That means the mill can produce 720,000 kgs per year by working 300 days.

But it is well known fact that there is weak economy of scale in feed mills, Because the process of feed mixed mill is so simple that more than 90% of production cost is for raw materials. Specially there is no benefit for procurement in large quantity under present quarter system for important feed grains.

4.2 Main Product

Main Product will be feed for pig. It is anticipated that transaction by bulk between private feed mixed mill and specialized farmers will be main stream in supplying pig feed, because of cost reduction.

In case of pig feed supplying through the members will be main marketing Channel, because pigs are mainly raised on small scale by the members and many farmers. Besides producing power feed it will produce fish meal feed, saugar added feed and fat added feed. (Appendix 5)

4.3 Location

The mill and warehouse will be constructed at the near Rongkwang Agricultural Cooperative.

4.4 Processing

The processing procedure of feed mill is divided into preparation of formula, putting of raw materials, grinding, dosing, weighting, mixing, corn, soybean, Fish meal, Vitamins, protein, sugar, fat, salt, and be Primix feed inspection and bagging. The flow chart will as appendix 7

4.5 Details of the feed mixed mill

Facilities and machinery of the feed mixed mill will be under. Government sets some standards for constructing feed mixed mill in order to modernize the feed mixed mills in Thailand.

Item	Unit	Project	Remarks
Capacity/day	kgs	300	-
Land	baht	86,000	
Building	"	414,000	
- Plantsilo	"	364,000	
- Electric and water	"	50,000	
Machinery			
Dreger	kgs	500	
Gresher	"	400	
Feed mixing	"	400	
Motor	baht	25,000	
Motor tank	"	150,000	
Motor-truck	"	450,000	

* Source: Kusana Lohae Company

4.6 Schedule of Constructing the feed Mixed mill.(Appendix) 7- 8

It will take approximately 12 month to build the feed mixed mill. For construction of the feed mixed mill it needs to organize the special group in which 7 persons would work during construction period.(Project Manager, Marketing Staff, Technician, 2 Permanent worker, Research Staff, driver) Their tasks are as below. (Appendix 8,9)

1. Selection Land in Rongkwang Agricultural Cooperative.
2. Working out the detail plan: They will make a plan about layout of the mill and process of the mill after have land.
3. Ordering machinery: They will classify imported machinery and home machinery. After that they will make a plan for installation work to be carried
4. Construction work
5. Test run: After completion of construction, it needs one or two months for test During this period they will check and correct defects.

4.7 Production Plan for 9 year

Production plan on turnover of the members and production trend of newly built project is give below
(Appendix 14)

4.8 Investment

Capital cost of the project: the capital cost is estimated as below on the basis of price as of April 1990

Item	Cost	Remarks
Land in the cooperative	86,000	
Building	414,000	
- Plant, silos	-364,000	
- Electric, water	- 50,000	
Machinery and Equipment	305,000	
Dryer	40,000	
Grusher	140,000	
Mixing	100,000	
Motor	25,000	
Motor-tank	150,000	
Motor-truck	450,000	
Other		
- Repairing and maintenank. expense.	10,000	
total	1,415,000	

4.9 Marketing Channel (Appendix 12)

It is already told that Agricultural Coops in the District and the members district and the province will supply feed through existing marketing channel. They have 47 group and 3,500 members.

Thought small in purchasing quantity individually, purchasing quantity of a village as whole is great. So Agricultural Coops. encourage joint purchasing activities in village level through group, one of the grass root coop organisations and deliver feed to the villagers from the mill or chain shop by using their own truck without extracharge. This is one benefit Agricultural coops can offer to their member farmers.

The farmers will pay for purchased feed within 40 day after receiving feed. In case farmers want feed on credit for more than 40 day, Agricultural Coops will provide loans.

4.10 Extension Service

The feed mixed mill will organize extension group consisted of feed expert and veterinary for dissemination of livestock raising knowledge. They will have lecturing tour and hold meetings for member farmers and staff Agricultural. Also they will work as consultation group for member farmers.

CHAPTER V

ORGANIZATION AND MANAGEMENT

5.1 Organization and Structure

The project will be implement by Rongkwang Agricultural Cooperative in Phrae Province. The activities of the cooperative at the present are providing credit, procuring and marketing the member produces, farm input and consumption goods supply, collecting members's produces and deposit from the members. The Organization structures are as follow.

5.1.1 Occupation

- grow crop feilds 3,000 persons
- raising livestock 3,500 persons

in the year they have the feed average 656 kgs/person.

5.1.2 Member

The organization is comprised of 3,500 members playing a role as the project ower.

5.1.3 Board of Director

There have 1.5 member in board of director whom are elected from the members in General Meeting.

5.1.4 Project staff is comprised of various officer as below:

- Administration staff
 - Project Manager 1
 - Maketing staff 1
 - Driver 1
- Production Staff
 - Technician 1
 - Research staff 1
 - Permanent Workers 1

5.2 Role of Organization

a) Member

There are 3,500 members and each one will take at least 118 shares of stock in the project (1 share= 10 baht)

The members who raise livestock have to buy their feed to the cooperative.

b) Board of Directors

They make the cooperative policies in accordance with the project operation and make decision on the operation policy.

c) Management staff

- Project Manager

He is responsible for all administration of the project and the processing plant. He will look after the maintenance. Production schedule and marketing planning with the help of technician and marketing officer.

- Marketing staff

He will take charge of marketing; provides feed markets including helping the manager for marketing planning.

- Driver

He will be hired for distribution purpose.

- Technician

He will be incharge of the operation of the plant.

- Research staff

He is responsible for research feed.

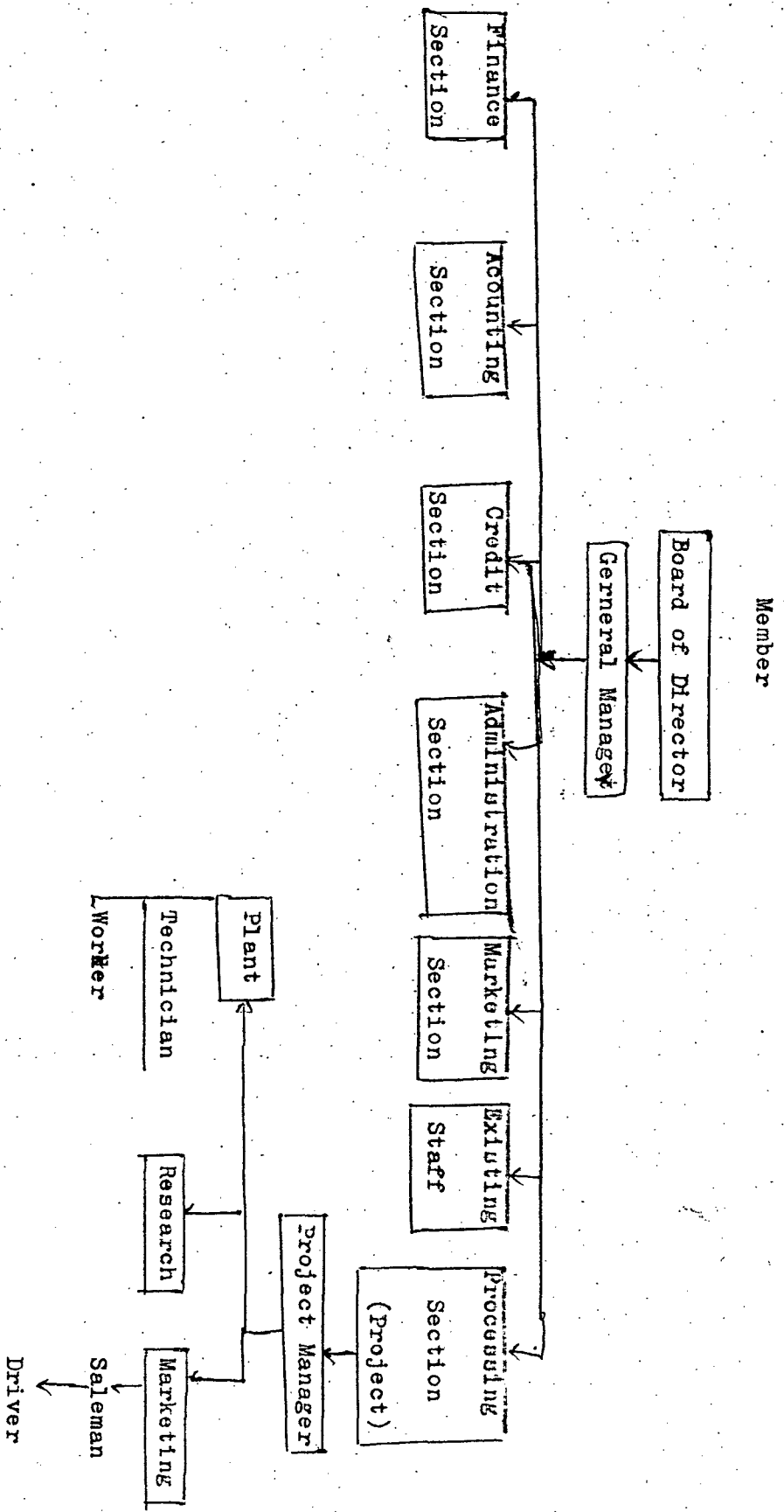
5.3 Personal Expenses and Qualification

Kind of work	No	Annurl Pay (baht)	Qualufucation	Expperience
Project Manager	1	51,240	College Craduate	5
Marketing staff	1	36,600	College or High	2
Technician	1	36,000	School Gertification	2
Research staff	1	36,000	"	2
Driver	1	26,400	"	-
Permanent Worker	2	36,000	"	-

5.4 Project Management

The project will be under the management of project Manager, and the pro~~o~~ssing plant is the processing division which is one of the activeties of the cooperative. It is the responsibility of General Manager who runs the business according to the Board of birector' policy.

Organization Chart



CHAPTER VI

FINANCIAL ANALYSIS

Financial analysis of the project has been keeping the following main assumptions.

1. The project period is 11 year. The plant life is 10 year.
2. The construction of plant is in the first year the eleventh year product will be 100 % or full of capacity.
3. To calculate depreciation cost of the project will use straight line method and salvage which has assumed at zero at the end of the project.
4. In the project it will use office and facilities exist in the cooperative.
5. The project processing is 240 days in a year.

6.1 Project Cost

It is estimated that the cost of the feed mixed mill will be 1,415,000 baht broken down as follow:

Land and building	500,000	baht
Machinery	905,000	"
Other	10,000	"
Total	1,415,000	"

Note: See Exhibit for the break down of project cost

6.2 Requirement of working capital

Operating year	1	2	3	4	5	6	7	8
Working Capital	490,000	490,000	490,000	490,000	490,000	490,000	490,000	490,000
	3	10						
	490,000	490,000						

6.3 Production Cost

Production cost per kgs in case of 100% of capacity utilization is calculated as under (Appendix 14)

6.4 Depreciation

Depreciation on the mill and machineries has been use strighline method for 10 year operation period. It would be 171,200 baht a year. (Appendix 11)

6.5 Financial Cost

Financial Cost in the project means the cost of interest payment, see detail in Appendix 13

6.6 Return on Investment

From the assumption above we can calculate net profit break even point, benefit-cost analysis and internal rate of return.

a) Net Profit

Net profit at are as follow:

1 year	331,960 baht
2 year	341,460 "
3 year	351,863 "
4 year	363,254 "

b) Break even point

The break even will be anlysis on the basis of the production cost in each year from 1 year up to 10 year

year	Break even quantities (kgs)	Break even Revenue (baht)
1	85,868.33	652,599.33
2	84,379.31	641,282.75
3	82,748.75	628,990.50
4	80,963.32	615,321.23

c) Cost- Benefit Analysis

The project has been assumed to use discount rate at 14 percent, according to the table in appendix the B/C ratio is 1.77

d) Net Present Value (NPV)

The present value of the project at 14 percent is 4,317,892.

e) Internal Rate of Return

Internal Rate of Return (IRR) of the project is 38.98%

~~6.7 Sensitive Analysis~~

~~It we assume that~~

~~10% increase in cost of Raw Material IRR will be 3~~

~~20% increase in cost of Raw Material IRR will be %~~

~~20% increase in cost of investment IRR will be 3~~

~~10% decrease in revenue IRR will be 3~~

~~20% decrease in revenue IRR will be less than~~

~~10% decrease in revenue and 10% increase in cost of~~

~~Raw material IRR will be less than Zero.~~

~~6.8 Farmers' Benefits~~

~~It~~

CHAPTER VII
BUDGET

The total project investment cost is about 1,415,000 baht it will be covered by longterm loan and Share capital.

a) Long term Loan

Loan term Loan is needed to purchase building Machineries, moter - truck and Development land in and other. The total investment cost required 1,415,000 baht will be concerued by credit long term.

b) Share Capital

The cooperative will collect share capital from the members. The value of share capital id 10 baht a share, which each member takes about 118 shares so from 3,500 members it will get share capital 415,000 baht,

Long term would be borrowed from Bank Agriculture and Agriculture Cooperatives (BAAC) interest rate 9.5 percent per year.

The funds of the project would be raised as follow:

Sources	Amount(Baht)
Member share	415,000
Loan	1,000,000
Total	1,415,000

The project has been assumld that interest rate of loan in 8 year repayment is 9,5 percent per year.

The detail of year wise budget of the project and loan repayment schedual are in appendix 13)

CHAPTER VIII

Benefit of the project and Recommendations

8.1 Benefit Project

By implementing the project following benefits can be enumerated.

1. Member farmers can reduce production cost by being supplied with qualified feed in low price. The project feed mixed mill will be supply feed to farmer in the same price with the shop. In actual market as private mills sometime offer discounted price to farmers it is difficult to measure benefit returnel to farmers.

2. Farmers will get indirect benefit resulted from restraining large private companies market control by their organization.

3. The project will increase the income of farmers concerued by wsing domestec raw materials such as corn, by pproduct of grains.

4. The project can help industrialization of the project area. It will generate employment in area.

5. The project can help Agricultural Cooperative to do businenss related with animal for membef farmer

6. The project can help Agricultural cooperative if the project has strong supported from Cooperative Deparment it will suceed in Operation .

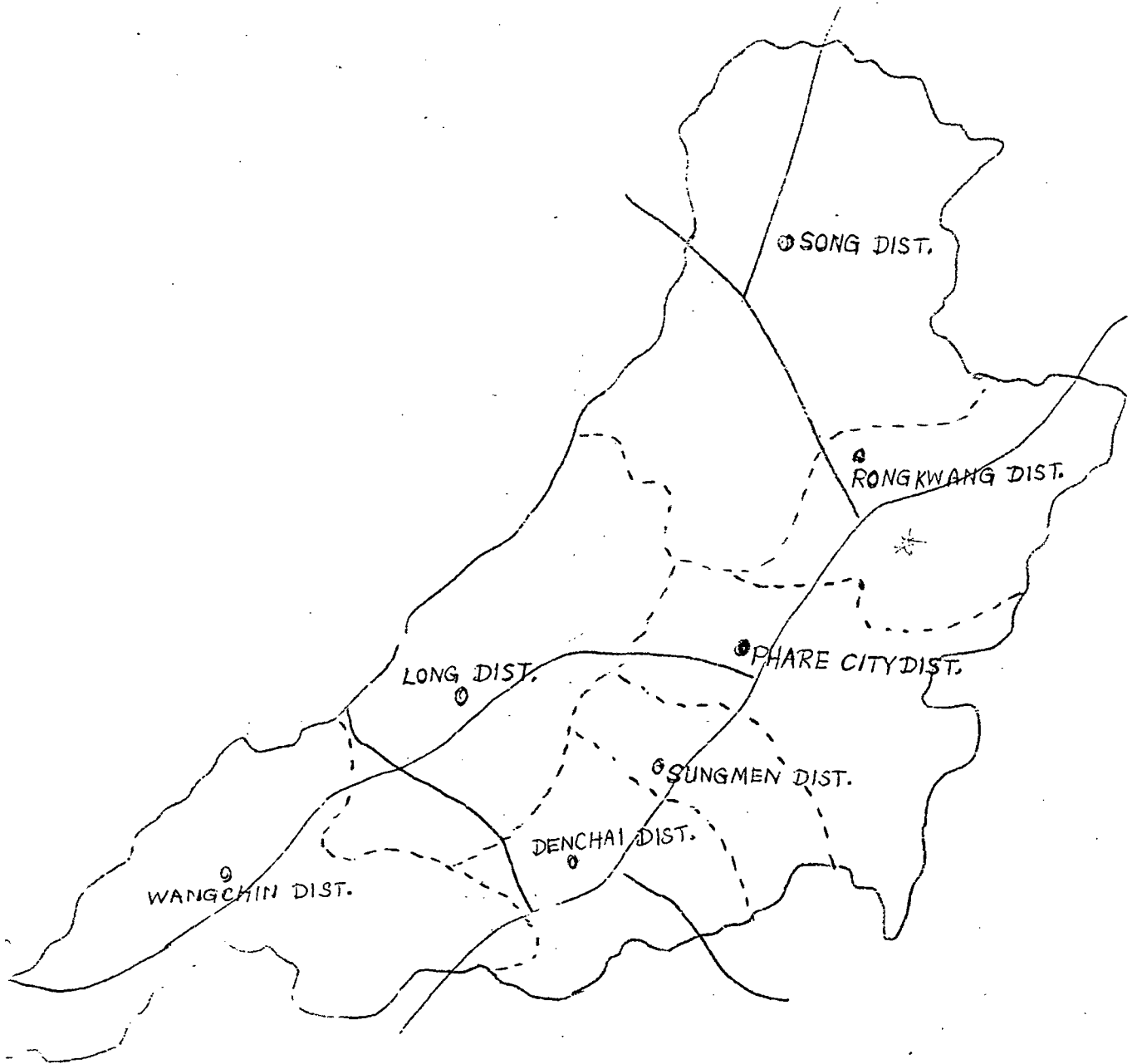
8.2 Recommendations

1. At the beginning of the operation of project mill, The feed mixed mill will give some competition with the cooperative and private mills. But considering the fact that the private mill generally think of the own profit and the cooperative have some limitation in marketing outlet for farmers, the feed mixed mill should be established by Agricultural Coops, who can give better service to member farmers in remote villages through existing selling outlet and market share in the province.

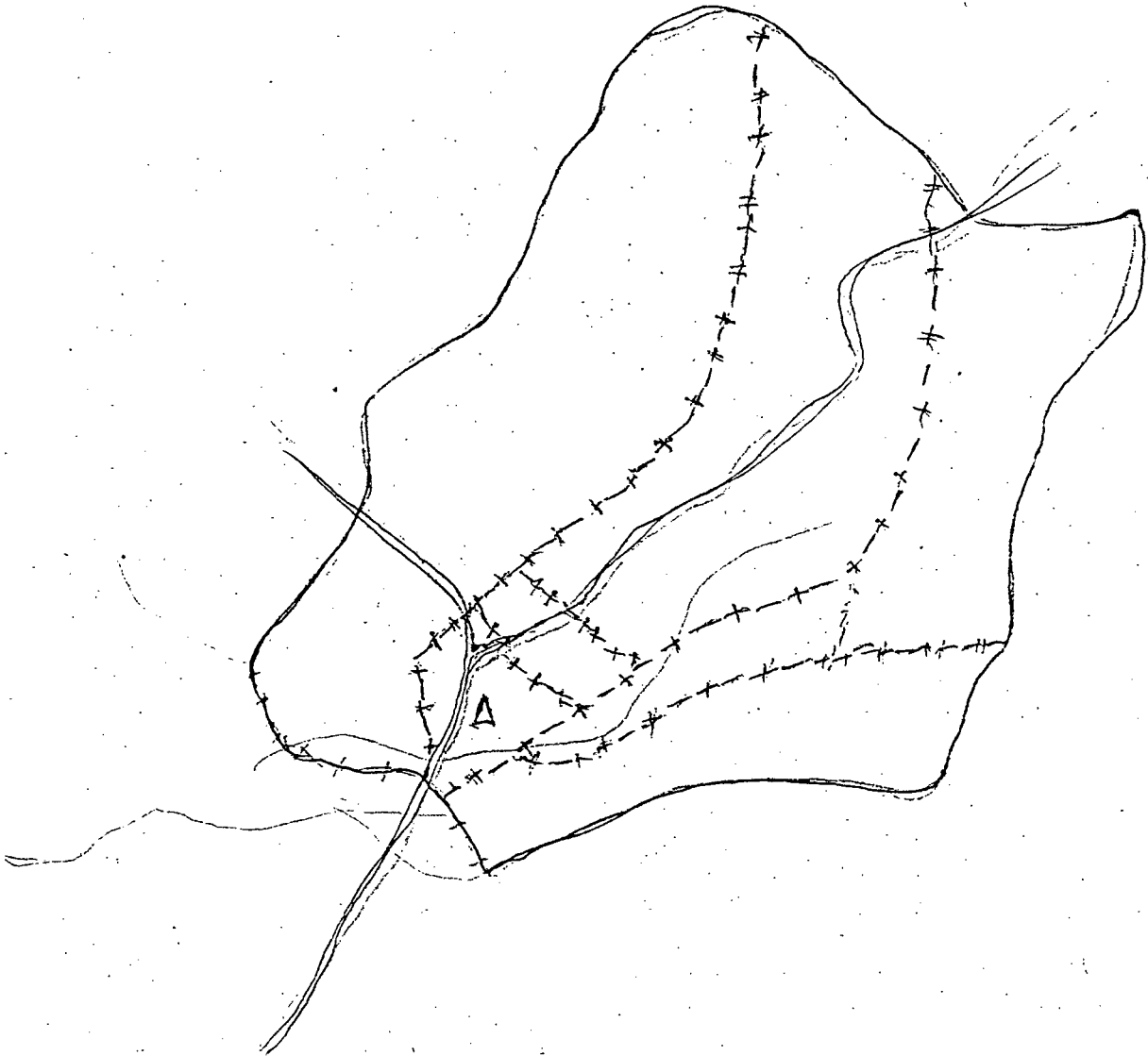
2. Government has refused to approve new feed mill for regulation of increased consumption of imported feed grains and modernization of feed mill. Certainly it has got some good result, but on the other hand it has protected the vested interest of existing mills. As a result large companies can control the market by expanding capacity and merging small feed mills in spite of weak economy of scale in feed industry and member farmers have been placed at a disadvantageous position.


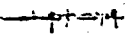
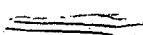


APPENDICES

Map of Phare



MAP OF DISTRICT
RONGKWANG



-  DISTRICT
-  VILLEGE
-  ROAD
-  RIVER
-  RONGKWANG AGRICULTURE COOP .

Appendix 1

Livestock Population in District

Year	Pig	Chicken	Cattle
1980	72,015	176,000	
1981	73,000	175,000	
1982	72,000	180,000	
1983	71,000	179,000	
1984	72,080	180,000	
1985	72,500	185,252	
1986	72,800	184,000	
1987	73,000	184,000	
1988	73,000	185,160	
1989	73,200	185,000	
1990	74,252	185,630	

source; Agriculture District office.

Appendix 2

Livestock member in Coop.

Year	Pig Head	Chicken Head
1980	7,500	25,000
1981	7,500	26,000
1982	7,600	24,000
1983	7,600	25,000
1984	7,700	26,000
1985	7,600	22,000
1986	7,800	26,000
1987	8,000	27,000
1988	7,900	26,000
1989	7,900	28,000
1990	8,000	30,000

source; Credit Section Coops

Appendix 3

Cooperative Situation of Feed Market

Year	Pig kgs	Chicken kgs
1980	675,000	-
1981	675,000	
1982	684,000	
1983	684,000	
1984	693,000	
1985	684,000	
1986	702,000	
1987	720,000	
1988	711,000	
1989	711,000	
1990	720,000	

source; Marketing Section Coops.

Appendix 4

District Situation of Feed Market

Year	pig kgs.	Chicken kgs.
1980	6,848,350	5,280,000
1981	6,570,000	5,600,000
1982	6,480,000	5,760,000
1983	6,390,000	5,728,000
1984	6,487,200	5,760,000
1985	6,525,000	5,928,064
1986	6,552,000	5,888,000
1987	6,570,000	5,925,120
1989	6,588,000	5,920,000
1990	668,268	5,940,160

source: Marketing District.

Appendix 5

Formula Feed

	Item	Pig weigh(5-20kgs)	Pig (20-60kgs)	Pig (50-110kgs)
1	Corn	64.50	80.00	82.70
2	Refined ltrans -	-	-	-
3	Soybean meal	20.00	12.20	12.00
4	Fish meal	7.00	6.00	3.00
5	Dricacime Forfèrt	1.50	1.20	1.70
6	Sugar	2.00	-	-
7	Fat	4.00	-	-
8	Salt	0.20	0.35	0.35
9	Rrimix	1.00	0.50	0.50
	total	100.20	100.25	100.25

SOURCE : BOTAGO COMPANY

APPENDIX 6

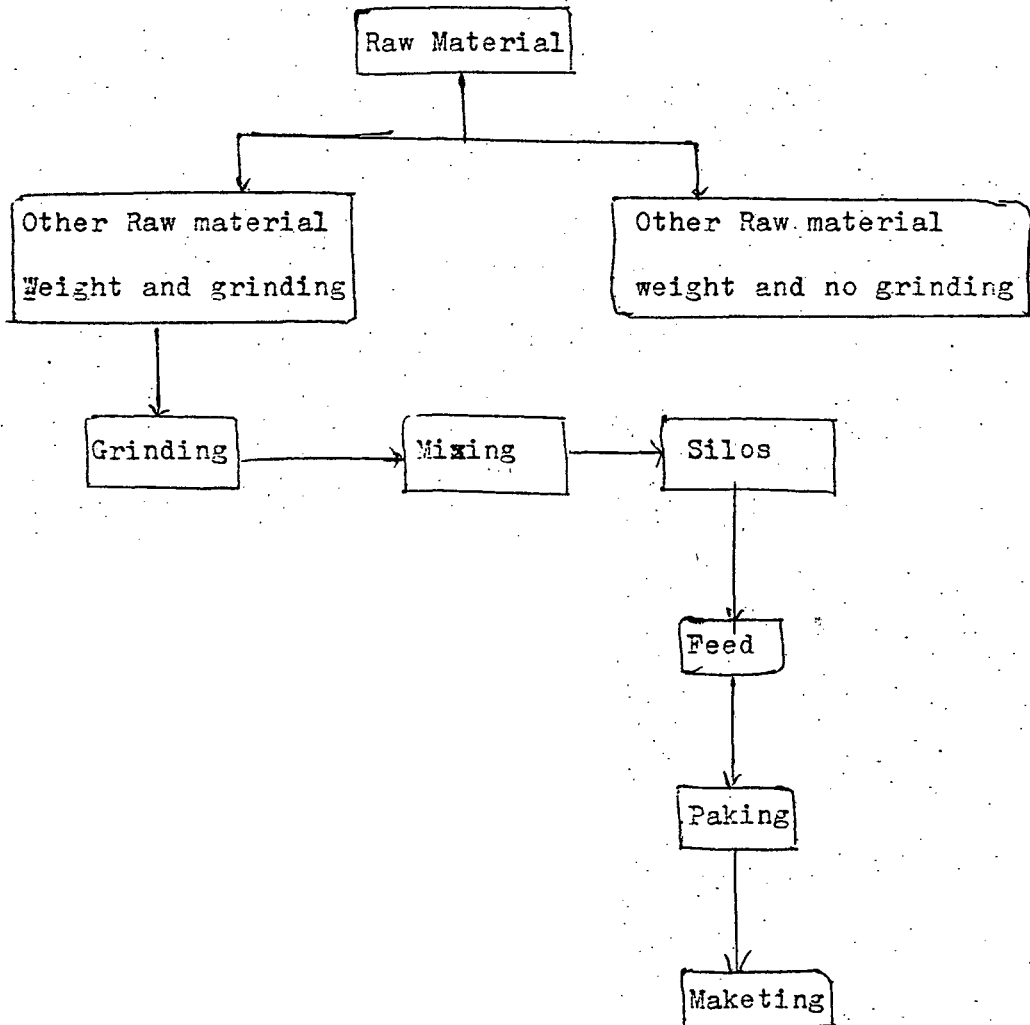
Cost of Raw Material in 1990/1991

Cost	Pig (weigh(5-20 kgs))		Pig (weigh20-60kgs)		Pig(weigh50-110kgs)		Remake
	Baht	kgs	Baht	kgs	Baht	kgs	
Corn	3,765.71	64.50	1,532.16	80.00	1,583.87	82.72	3.25 Baht/kgs
Refined brans	-	-	-	-	-	-	3.80 "
Soybean meal	3,950.10	20.00	803.11	12.20	790.02	12.00	11 "
Fish meal	2,011.84	7.00	574.56	6.00	287.20	3.00	16 "
Driedlime Profant	80.82	1.50	21.54	1.20	30.51	1.70	3 "
Sugar	466.96	2.00	-	-	-	-	13 "
Grude fat	1,796.25	4.00	-	-	-	-	25 "
Salt	10.77	.20	6.27	.35	6.27	.35	3 "
Delmixed	1,436.25	1.00	209.30	.35	209,30	.35	80.70 "
total cost (B/kgs)	13,519.25	100.20	3,146.94	100.25	2,907.17	100.25	
Average cost (B/kgs)	7.51		5.24		4.84		
total cost (Baht/kgs)	5.86		total average sales (Baht/kgs)		7.60		

source: Agriculture Economic office and Batago company:

Appendix 7

Processing



Appendix B

Construction Schedule

Item	Schedule											
	1	2	3	4	5	6	7	8	9	10	11	12
(months)	1	2	3	4	5	6	7	8	9	10	11	12
Selection Land	6											
Collecting Information												
Making Detail Plan												
Making of Layout of the mile												
Grological Survery												
Construction of Building												
Public Works												
Installation of Machinery												
Electric Work												
Hyienic Work of Cooling												
Heating Fire-fighting, communication sys.												
Other Equipment												
Test Run												

APPENDIX 10

INVESTMENT COST

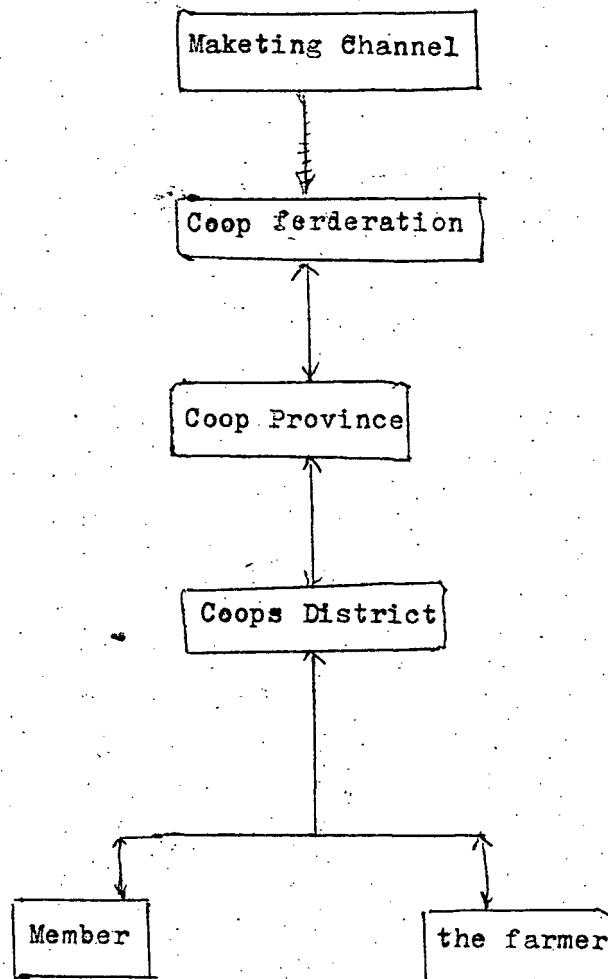
	Amount (Baht)	
Land 3 rais and Development (36,000+50,000)	86,000	86,000
Building		
- Plant and warehouse (silos) 20 x 12	364,000	
- Electric and water Main system and other	50,000	414,000
Machineryes		
- Dryer	40,000	
- Crusher	140,000	
- Feed mixidg (Vehicle) 3,000kgs/day	100,000	
- Motor	25,000	305,000
-Motor-tank	150,000	
- Motor-truck	450,000	600,000
Other		
- Repairing and maintenaua expense	10,000	10,000
total investment cost		1,415,000

Appendix 11

Depreciation

Depreciation	Annual	Depreciation	Salvage Value
Building, silos, etc	414,000 5%	20,700	207,000
Machineries	305,000 10%	30,500	-
Motor and truck	600,000 20%	120,000	
	total	1,712,000	

Appendix 12



Appendix 13

Loan Repayment Schedule

year	Principal outstanding	Annual repayment	Interest 9.5	Principal repayment	Principal balance
1	1,000,000	195,000	95,000	100,000	900,000
2	900,000	195,000	85,500	109,500	790,500
3	790,500	195,000	75,097	119,903	670,597
4	670,597	195,000	63,706	131,294	539,303
5	539,303	195,000	51,233	143,767	395,536
6	395,536	195,000	37,575	157,425	238,111
7	238,111	195,000	22,620	172,380	65,731
8	65,731	71,975	6,244	65,731	0
9	-				
10	-				

Appendix 14

Cost of Production

Year	1	2	3	4	5	6	7	8	9	10
A FIXED COST										
-Salary	221,640	221,640	221,640	221,640	221,640	221,640	221,640	221,640	221,640	221,640
-Insurance	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
-Depreciation	171,200	171,200	171,200	171,200	171,200	171,200	171,200	171,200	171,200	171,200
-Financial	95,000	85,500	95,097	63,706	51,233	37,575	22,620	6,244	-	-
total	547,840	538,340	527,937	516,546	504,073	490,415	475,460	459,084	452,840	452,840
B VARIABLE COST										
-Raw Material	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200
-Packaging	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000
-Electric	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
-Oil Plant	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Machinica										
- Oil BUS	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
-Investmet										
Working capital	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000
Noted	4,592,200	4,592,200	4,592,200	4,592,200	4,592,200	4,592,200	4,592,200	4,592,200	4,592,200	4,592,200
Average Barible cost (A.V.C)	421,960.38	6,38	6,38	6,38	6,38	6,38	6,38	6,38	6,38	6,38
Breake Even										
Quantity (B.E.G.) (kgs)	85,868.33	84,379.31	82,748.75	80,963.32	79,008.31	76,867.56	74,523.51	71,956.74	70,978.06	70,978.06

Appendix 15

Annual Production cost Estimate

Year	1	2	3	4	5	6	7	8	9	10
-RAW Materil	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200	4,219,200
-Salary	221,640	221,640	221,640	221,640	221,640	221,640	221,640	221,640	221,640	221,640
-Packing	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000
-Electric	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
-Oil Plant and Machine	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
-Oil Bus and Machine	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
-Inserance	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
-Interest in working capital	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000
Sub total	4,873,840	4,873,840	4,873,840	4,873,840	4,873,840	4,873,840	4,873,840	4,873,840	4,873,840	4,873,840
-Depreciation	171,200	171,200	171,200	171,200	171,200	171,200	171,200	171,200	171,200	171,200
-cost Financial	95,000	185,500	175,097	63,706	51,233	37,575	22,629	6,244		
Total Production Cost	5,140,040	5,130,540	5,120,137	5,108,746	5,096,273	5,082,615	5,067,660	5,051,254	5,045,040	5,045,040

Appendix 16

Net Income statement

Year	0	1	2	3	4	5	6	7	8	9	10
A Sales											
-Feed	-5,472,000	5,472,000	5,472,000	5,472,000	5,472,000	5,472,000	5,472,000	5,472,000	5,472,000	5,472,000	5,472,000
B Production											
Cost	-5,140,040	5,130,540	5,120,137	5,108,746	5,096,273	5,082,615	5,067,660	5,051,284	5,045,040	5,045,040	5,045,040
Profit	331,960	341,460	351,863	363,254	375,727	389,385	403,340	420,716	426,960	426,960	

Appendix 17

Repayment Schedule

Year	PRINCIPAL OUTSTANDING	INTEREST 4.5%	PRINCIPAL REPAYMENT	PRINCIPAL BALANCE	TOTAL PRINCIPAL REPAYMENT	ANNUAL FUND AMOUNT BE REPAYMENT
1	1,000,000	95,000	100,000	900,000	195,000	598,160
2	900,000	85,500	109,500	790,500	195,000	598,160
3	790,500	75,095	119,903	670,597	195,000	598,160
4	670,597	63,706	131,294	539,303	195,000	598,160
5	539,536	51,233	143,767	395,536	195,000	598,160
6	395,536	37,575	157,425	238,111	195,000	598,160
7	238,111	22,620	172,380	65,731	195,000	598,160
8	65,731	6,244	65,731	-	71,975	598,160
9	-	-	-	-	-	598,160
10	-	-	-	-	-	598,160

Appendix 18

Year	Investment	Cash Inflow	Salvage	NET Cash Flow
0	1,415,000			-1,415,000
1	-	598,160		598,160
2	-	598,160		598,160
3	-	598,160		598,160
4	-	598,160		598,160
5	-	598,160		598,160
6	600,000	598,160		- 1,840
7	-	598,160		598,160
8	-	598,160		598,160
9	-	598,160		598,160
10	-	598,160	207,000	805,160

Benefit Cost Analysis

Year	Benefit	Cost	PWFP 14%	Present Value Benefit	Present Value Cost
0	-	-1,415,000	1.000	-	-1,415,000
1	5,472,000	4,873,840	.877	4,798,944	4,274,357
2	5,472,000	4,873,840	.769	4,207,968	3,747,982
3	5,472,000	4,873,840	.675	3,693,600	3,289,842
4	5,472,000	4,873,840	.592	3,239,424	2,885,313
5	5,472,000	4,873,840	.519	2,839,968	2,529,522
6	5,472,000	4,873,840	.456	2,495,232	2,496,071
7	5,472,000	4,873,840	.400	2,188,800	1,949,536
8	5,472,000	4,873,840	.351	1,920,672	1,710,717
9	5,472,000	4,873,840	.308	1,685,376	1,501,142
10	5,679,000	4,873,840	.270	1,599,330	1,315,936
				28,603,310	24,285,418

$$\frac{B/C \text{ Ratio } 28,603,310}{24,285,418} = 1.17$$

$$NPV = 28,603,310 - 24,285,418 = 4,317,892$$

Appendix 20

Internal Rate of Return

Year	NET BENEFIT	PWF 20%	PV BENEFIT 20%	PWF BENEFIT 20%	PV BENEFIT 40%
0	-1,415,000	1.000	-1,415,000	1.000	-1,415,000
1	598,160	.833	498,267	.714	427,086
2	598,160	.694	415,123	.510	305,062
3	598,160	.579	346,335	.364	217,730
4	598,160	.482	288,313	.260	155,522
5	598,160	.402	240,460	.186	111,258
6	-1,840	.335	-616	.133	-245
7	598,160	.279	166,887	.095	56,825
8	598,160	.233	139,371	.068	40,675
9	598,160	.194	116,043	.048	28,712
10	805,160	.162	130,436	.035	28,181
			825,619		-44,194

IRR= 20+ 825,619 (20)

(825,619 +44,194)

= 20 + 18.98

38.98 %

Fifth ICA/Japan Training Course for Strengthening Management of Agricultural Co-operatives in Asia

INDIA, THAILAND, JAPAN & KOREA

October 22,1990 -May 10,1991

<i>TITLE OF PROJECT</i>	: INTERGRATING FARMING
<i>COUNTRY</i>	: THAILAND
<i>PROJECT PREPARED BY</i>	: SURIYA THUMMAVARO

Funded by the Government of Japan
and
Executed by the ICA in collaboration with its Member Organisations
in India, Thailand, Japan and Korea

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3. The project

4. Details of operations

5. Organisation and Management. left.

6. Financial Analysis

7. Budget

8. Recommendations

ACKNOWLEDGEMENT

I would like to express my sincere appreciation and profound gratitude to the following people and institutions for various form of assistance and encouragement to this program proposal as well as my training course;

To Professors in IIM and Mr. M.V.Madane project director. for their valuable teaching. suggestions. assistance and moral support during my training course in New Delhi. India:

To the International Cooperative Alliance [ICA] for granting me the scholarship including financial support for this training course:

I would like also to take this opportunity to express my special thank and deep appreciation to the Board of Directors of MPACL. the government officers at the Phichit Provincial Cooperative Office and Meung - Phichit District Cooperative Office. and staff of the Cooperative League of Thailand. for their moral support and encouragement:

Suriya Thummevaro

Feb. 1990

CHAPTER I

SUMMARY

1. Phichit province is one of 74 provinces in Thailand which is located in the north of the country. It is 531 kilometres far away from Bangkok. The total areas is about 453.014 square kilometres. At present, the province is divided into 8 districts, namely:

1. Meung district
2. Phopratachang district
3. Samngam district
4. Bangmulnark district
5. Thapkhon district
6. Tapanhin district
7. Photala district
8. Wangsaipoon district

2. The total populations of the province is comprised with 290,105 men and 340,301 women to totally 630,406 persons. Out of 630,406 persons, there are 409,763 persons or about 65 percents live in the rural areas and engage in agriculture. The total agricultural land is approximately 7,990,783 rai [1 rai is equal to 0.16 hectare] which is devoted to rice areas 5,793,653 rai, field crops 893,645 rai and fruit trees 1,303,485 rai. However, with regard to the

total agricultural land. there are only 1,198,617 rais or about 15 percents access to water from irrigation programme.

3. The Meung Phichit Agricultural Cooperative Limited [MPACL] is now composed of 43 groups distributing all over Meung district in 1d5 Tumbol [district can compare with a small city or big town while Tumbol can compares with small town. In Thailand Tumbol is a sub- district]. The total members are 950 persons or families. Most of members are engaged in agriculture especially planting rice. The agricultural land of the members is about 28,572 rais. Out of 28,572 rais. there are only 5,428 rais or about 19 percets located in irrigation areas and the remaining. the majority is low land. Evidence clearly indicated that ther is only irrigated areas where members can produce rice twice a year. With regard to rice production. the total production is averaging 6,517 tons a year which is classified to first rice and sceond rice about 4,345 and 2,172 tons. respectively. Due to this amount of product. most of them are sold to local merchants and left a few to be sold to the MPACL. The problem faced with the members as well as other farmers is low level

of product price in spite of a number of projects and programs were designed to address this problem in each year.

4. With recognition to this problem, the MPACL has clearly emphasized in its policies that the cooperative will encourage their members to change the production pattern from planting only rice to integrated farming system. This will reduce the members' risks from low level of product price as well as uncertainty from nature and others. In addition the MPACL will also do their business completely starting from procurement of farm supplies and daily used items as well as agricultural credit and agricultural extension of effective farming for the members. Improvement of land levelling, water management and training of related knowledge are also included. Moreover, the MPACL will extend the activities to include the assembling of members products.

However, in order to implement all these activities, it is important to train those of members to possess enough and appropriate knowledge and the right attitude, first.

5. Regarding the integrated farming program which will be implemented in the MPACL . one operational areas for one will be composed of 10 rais. The areas will be utilized as following

1. rais dwill be developed to be farm pond for raising various kind of fish [around 3.000 fish] as well as utilizing in planting and raising of cattles.

- The remaining [9 rais] will be dovoted to planting nting rice. field crops and fruit trees as well as raising of cattles.

6. Program components

6.1 Members who will participate in the program is equal to 86 persons or family. They will be organized into two groups.

6.2 Involving agencies are comprised with:

1. District Office
2. District Fishery Office

3. District Agricultural Office
4. District Cattle Office
- 5 Cooperative Engineering Centre [NO. 6]
6. The MPACL
7. Provincial Cooperative Office
8. Distric Coperative Office

6.3 Investment cost is totally amounting to
3.440.000 bahts [1 us = 25 B] There are:

1. Land levelling investment for 86 families in
operational areas 860 rais of about 2.580.000 bahts
[cost for one family is about 30.000 baht]

2. Investment for procurement of seed . fish.
cattles and others of about 860.000 bahts [cost for one
family is about 10.000 bahts]

Total Budget to be invested in this programe will
be obtained by using the MPACL ' s funds.

6.4 The program duration is 5 years.

6.5 The financial analysis is as following;

1] Payback period = ~~8~~⁵ years

2]. IRR = ~~30.2~~^{35.2}%

3]. BCR = ~~1.29~~^{3.35}

4]. NPV = ~~30,366~~^{72,765} bahts

5]. Income member 12,849 ~~8~~

7. Program Benefits

7.1 Members can do their farms both planting and raising of cattles and others by effectiveness throughout the whole year.

7.2 Members can earn more income when we are comparing with without program.

So Table comparision income project and product paddy
and cost production. The project member have high income
1284 baht per rai and member low rish. The project not
problem market .But production paddy have problem low price
and market.

CHAPTER II

BACKGROUND

Thailand is already well - known as agricultural country. This is because of, up to now, more than a half of population still engaged in agriculture especially in planting rice. In addition Thailand is the first exporter of rice for a long time. This is due to the strong support of government in agriculture through various kind of projects and programs. However, by uncertainty of nature in relation to the situation of world market price and other related factors such as lack of enough budget and good cooperation among involving agencies, therefore have resulted Thai farmers to suffer from a number of problems like low price of products, low income and low level of standard of living.

In order to solve these problems to bring about the well - being for Thai farmers, the integrated farming program is highly recommended,

1p

This is due to the fact that integrated farming can reduce agricultural risks and enabling farmers to get more income.

AREA OF PROJECT

The integrated farming program which will be undertaken by the MPACL is designed to implement at Tumbol Meung - Kaow and Tumbol Rongchang in Meung District, Phichit Province. Some basic data of the implementing areas are as following:

1. Tumbol Meung -Kaow is composed of 6 villages.

The total population is about 5,270 persons [1,015 families] .

Out of 5,270 persons, there are 2,503 men and 2,767 women

The total agricultural land is approximately 119,309

rais which is devoted to rice areas about 115,943 rais.

However, the irrigation areas in this tambon is only 15,943 rais.

In addition, there are 102 farmers / families who are planning to register as MPACL members.

of about 2040 rais

2. Tumbol Rongchang is also comprised with 6 villages.. The total population is about 5,339 persons [1,031

families]. They are comprised with 2,622 men and 2,717 women. The total agricultural land is about 136,170 rais which is devoted to planting rice 128,926 rais. The irrigated areas is approximately 15,018 rais. In relation to the MPACL, there are 243 families who are planting of about 4,860 rais to register as MPACL ' s members. (Annexure)

Regarding the MPACL ' s members in these two tumbal, most of them can produce rice twice a year. The rice production in 1990 is amounting to 3,650 tons for the first rice and about 2,172 tons for the second rice which is averaging 500 kilograms per rae. This is comparing to the country ' s averaging [about 300 kilograms per rais] the result is acceptable. (Annexure)

However, the starting of this program will be included only 86 members with agricultural land about 860 rais. This will be implemented as a pilot program which will be replicated to other areas all over the country in the latter.

PROBLEMS FACED BY FARMERS

It is generally recognized that farmers who produce rice are still facing with a number of problems, Those of problems are as following :

1. Uncertainty of nature

Drought and flood are examples of problems from nature which are encountered by Thai farmers in nearly every year. This results agricultural occupation becoming more risky. The reason is that agriculture, especially planting rice, in Thailand is mostly depended upon nature water resulting from insufficient irrigated system.

2. Problems related to government

Although the government has strongly implemented projects and programs to address those of problems FACED BY THE FARMERS. BUT MOST OF THEM ARE FAILURE DUE TO A number of related factors such as inadequate capital and materials as well as insufficient policies and low level of coordination.

" The Production Credit and Marketing Linkage Program for Rice " of the Cooperative Promotion Department [CPD] for example, received government budget only 750 million bahts in 1990. Regarding this amount of money, it can be used to collect members ' paddy by maximum only about 200,000 tons . This compare with total members ' production about 5-7 million ton of paddy, it is still far away fro. the final target.

3. Other related problems

Problem from diseases and insects is another factor which is preventing farmers from effective cultivation and therefore, resulting them in low income level.

The other problems are due to the knowledge and attitude of farmers and so on. (APPENDIX)

CHAPTER III

PROJECT OBJECTIVES

1. To reduce rice planting areas.
2. To encourage farmers [member] in adopting new agricultural technologies to enabling them be able to offair more production and moue income.
3. To reduce agricultural risks from planting mono - crop.
4. To encourage farmers to utilize the agricultural land throughout the whole year by effectiveness.
5. To raise the farmers' income as well as their standard of living.
6. To reduce seasonal unemployment after harvest season.

NEED AND JUSTIFICATION PROJECT

1. Procurement

The project will procure like demonstration project to procure material and equipment for the project will be collaborated with every agencies as mentioned because of each agency is responsibility with equipment, tool and others which related to project.

Project procurement of the cooperative is started for member knowing the problems and the fact of paddy production. The farmer members, therefore, who successful, in participating the project shall be changed opinion and attitude of member.

The result will be submitted to every agricultural cooperatives in Pichit province to undertake the project and will distribute to agricultural cooperatives in other provinces near by. Certainly, successful of the project is all members can procure their

2. Marketing

Market of project produce section i.e. paddy, vegetable and other animals has no problem for marketing because we can consume in daily life and the local merchant will purchase direct

from the project area. The cooperative will serve their member in bargaining and selling. If the members are not satisfied with the price, the cooperative will take their products i.e. vegetables, fruits and fishes selling to near by province such as Pitsanuloke province, where is the central market centre supply vegetable, fruit and animal in Zone 5 of Northern provinces. Fair price in purchasing and selling because it is the central market where the merchant from other provinces come to purchase agricultural product by auction.

As for the comparative price mentioned above is the price which can sell in local market.

3. Transportation

Transportation of production or information services for member who participate the project, the cooperative can serve with. The convenient transportation of Highway of the province from cooperative society office to project district about 7 kms. and the road from Highway to project area approximately 4-5 kms. The cooperative has 1 medium truck for transport products and the members who participate the project have their own pickup truck (E-tan) for agricultural products. In case of large amount of production the cooperative will be able to rent long for members services.

C. M. K. H.

Details of Operation

For project expect to farmers of participate Project. promotion of farmers cooperation with Government support Operation of Project, government support get training to farmers. Training of farmers on operation and cooperation with government and and agricultural cooperative. The aim of project have diversification to other farmers and many areas. The function of government supports and agricultural cooperative :

1. Agricultural Cooperative: support fund of project and set group farmers.
2. District Officer : support this project to government
3. Kaset Amphur: teach group farmers with new technical of plant.
4. Pramong Amphur: gave fish to group farmers.
5. Prasusart Amphur : take care of group farmers about animal's.

So that. this project have promotion of farmers. cooperation with government and have divide function of government support. The meeting of government support have every month. They have objective to monitoring and evaluation.

CHAPTER IV

DETAIL OF OPERATION

4.1 Capacity of the project :

The project will be implemented in 2 member groups with 86 members . The project will cover the area of 860 rai. The members are free to select the model of mix farming according to their need.

4.2. Location

The mix farming project of Muang Pichit Agricultural Cooperative ltd. will be located in Rongchang village cover in the area of 460 rai and Muang Kao village cover in the area of 400 rai.

4.3. Main Products

The average farm land for each member is about 10 rai. The main production will emphasize on animals such as fish culture and pig raising . The farming will emphasize on cash crop such as banana, Papaya string bean and tomato as well as

mango, pomelo and coconut. The farm land for mix farming will not grow paddy.

4.4 Processing

The project will start with 2 pilot groups of 86 members. As soon as the project is accomplished within 5 years, the cooperative will increase the project area to cover another 172 members in the area of 720 rai and in the next 5 years the project area will cover all 650 members of the cooperative. After the project is completed, the cooperative will expand to cover the non-member farmer.

INVESTMENT PLAN

Source of fund: Cooperative own fund will be loaned to the project. The total loan will be 3,440,000 B at the interest rate of 12.5 % p.a.

The cooperative will give a total loan of 40,000 to each member as follows:

- | | |
|--------------------|----------|
| - Land preparation | 30,000 B |
| - Seeding feed | 10,000 B |

The repayment of loan will be 10 years at the interest rate of 12.5% p.a. [see table]

Loan Repayment Sclicelule

year,	Principal outstanding	Annual Repayment	Interest 12.5%	Principal Repayment	Principal Balance
1	40000				
2	40000	4500	5000	4000	36000
3	36000	8500	4500	4000	32000
4	22000	8000	4000	4000	28000
5	28000	7500	3500	4000	24000
6	24000	7000	3000	4000	20000
7	20000	6500	2500	4000	16000
8	16000	6000	2000	4000	12000
9	12000	5500	1500	4000	8000
10	8000	5000	1000	4000	4000

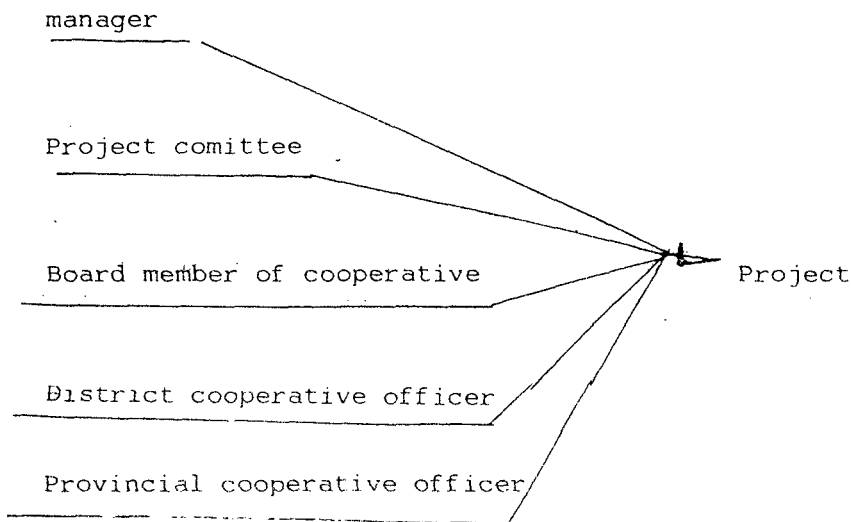
CHAPTER V

ORGANIZATION AND MANAGEMENT

Member group:

The project will set up a special project committee to supervise the project. The committee members will be selected from the board - members of the cooperative in the project area. The reason for selecting the board - members in the project area is to enable him to look at take can and give close supervision to the project members. The project committee will report directly to the board members of the cooperative who will report to the district cooperative officer and provincial cooperative officer.

project member



ORGANIZATION AND MANAGEMENT

Overall Management Policy

The project will be administered by the board of directors of Muang Pichit Agricultural Cooperative Ltd. including the follow - up and evaluation of the project.

The employees of the cooperative will be implementer of the project. The manager of the cooperative will be responsible for the project implementation. The task will be the selection of project members training on mix farming, land preparation and the price of the producer, to secure seeding fertilizers and insecticide, organize field visit to successful mix farming project as well as to farm guidance of farming including to secure local and expert markets.

The district cooperative officer and provincial cooperative officer will coordinate the project with other concern government agencies and assist in the promoting the project to other cooperatives as well as coordination for security government assistance.

Management Chart

1. Manager
2. District cooperative officer
3. Provincial cooperative officer
4. Board - members

PLANNING ACTIVITIES

1. To notify the project to the member group by August
2. Select 86 member in Muanjleav village area Rongchary village in August - September
3. The project committee inspect the qualificati of the project menvbers in Sep - Oct.
4. The project committee Select the project members Oct - Nov
5. Training on mix farmiry and field visit in Oct - Nov
6. To coordinate wit the cugineer Division of CPD for assistance in land preparation [Sep- Nov]
7. To process loan application few : and ~~pre~~paratove [Dec - Apr]
8. Land preparation [Jan - Apr]
9. To procure Amimals seedings fertilizer and insecticide . [Apr - May]
10. To stsrt growing [June - July]
11. To secur market outlets [June - July]
12. Evaluation [August - July]

CHAPTER VI

FINANCIAL ANALYSIS

- 6.1 The project life is 5 year. The first year require capital investment . The investment in the latter years will be administrative cost.
- 6.2 Interest in loan from the coop. the detail of the cost we shown in the table

Farmer Cost Fish

Items	1	2	3	4	5	6	7	8	9	10
I. <u>Fish for 1 rai</u>										
1. Investment	30000									
2. Operation	4900	5750	5750	5750	5750	5750	5750	5750	5750	5750
c. -fish 3.000 cost 750	750	750	750	750	750	750	750	750	750	750
-fish food	1820	2600	2600	2600	2600	2600	2600	2600	2600	2600
-substance	480	480	480	480	480	480	480	480	480	480
-fertilizer	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
-Oil	400	400	400	400	400	400	400	400	400	400
-other	4500	520	520	520	520	520	520	520	520	520

Farmer Cost Fruit

Items	1	2	3	4	5	6	7	8	9	10
II Fruit Cost	5100	1638	2414	2414	2414	2414	2414	2414	2414	2414
Land	900	-	-	-	-	-	-	-	-	-
Seeds	2880	-	-	-	-	-	-	-	-	-
Fertilizer	537	1080	1620	1620	1620	1620	1620	1620	1620	1620
CHEMICAL	450	450	632	632	632	632	632	632	632	632
Other	333	108	162	162	162	162	162	162	162	162
Total	40000	7388	8164	8164	8164	8164	8164	8164	8164	8164

Income Member

Items	1	2	3	4	5	6	7	8	9	10
Fish	0.000	12.600	12.600	12.600	12.600	11.600	12.600	12.600	12.600	12.600
Fruit	-	-	-	8.640	15.120	21.600	15.200	31.845	31.845	31.845
Total	0.000	12.600	12.600	21.240	34.500	37.200	44.445	44.445	44.445	44.445

Fruit Orange 16: 1 rai

Fish production y_1 500 kgs price 18 per 1kgs

$y_2 - y_{10}$ 700kgs price 18 β 1 kgs

Fruits Orange y_4 production 576 kgs price 15 β = 8640 β

y_5 " 1,008 " 15 β - 15120 β

y_6 " 1,440 " 15 β - 21600 β

y_7 " 1680 " 15 β - 25200 β

y_{8-10} " 44445 " 15 β - 31,845 β

2123

Financial Analysis Member

year	1	2	3	4	5	6	7	8	9	10	11
Cash inflow											
Fish Sales	9000	12600	12600	12600	12600	12600	12600	12600	12600	12600	12600
Fruit Sales	-	-	-	8640	15120	21600	25200	31845	31845	31845	31845
Total	9000	12600	12600	21240	27720	34200	31900	44445	44445	44445	44445
Cash outflow											
Investment	30000										
operating cost (Fish)	4900	5950	5750	5750	5750	5750	5750	5750	5750	5950	5750
operating cost (Fruit)	5100	1638	2414	2414	2414	2414	2414	2414	2414	2414	2414
Total	40,000	7388	8164	8164	8164	8164	8164	8164	8164	8164	8164
Net Cash Inflow	-31,000	5212	4436	13,076	19556	26036	29636	36281	36281	36281	36281
Discount Factor (14%)	1000	.877	.769	.685	.592	.519	.456	.400	.351	.308	.270
Present Value	-31000	4591	3411	8957	11577	13513	13514	14512	12735	11175	9796
Net Cash Inflow	-31000	5212	4436	13,096	19556	26036	29636	36281	36281	36281	36281
Discount Factor (30%)	1000	.769	.592	.455	.350	.269	.207	.159	.123	.094	.073
Present Value	-31000	4008	2626	5950	6845	7004	6135	5169	4463	3410	2649

Pay Back period 5 year

Benefit 103761

Cost 31000

PER 3.35

NPV = 3.35

NPV (@ 14%) 72.761

NPV (@ 30%) 17.859

IRR, 30% + (30-14) * 17.859 = 72761-17859

= 35.2%

SENSITIVITY ANALYSIS

Year	1	2	3	4	5	6	7	8	9	10	11
Cash inflows	8100	11340	11340	19116	24948	30780	34020	40000	40000	40000	40000
Cash outflows	40000	7388	8146	8164	8164	8164	8164	8164	8164	8164	8164
Net cash inflows	-31900	3952	3176	10952	16784	22616	25856	31836	31836	31836	31836
Discount Factor 14%	1000	.817	.709	.625	.552	.489	.436	.390	.351	.308	.290
Present Value 14%	-31900	3266	2242	7502	9336	11738	11790	12734	11174	9805	8596
Discount Factor 30%	1000	.769	.592	.455	.350	.269	.209	.159	.123	.094	.073
Present Value 30%	-31900	3039	1880	4983	5874	6084	5352	5062	3916	2993	2324

$NPV (14\%) = 57283$ $IRR = 30\% + (30-14) \times \frac{9607}{57283-9607}$
 $NPV (30\%) = 9607$ $= 33.2\%$

Chapter 7 Budget

Budget Loan for Coop. 3,440,000R Interest Rate 12.50%

Items	1	2	3	4	5	6	7	8	9	10
Investment	3440000	325768	702,104	702,104	702,104	702,104	702,104	702,104	702,104	702,104
Income Project	774,000	1083,000	1083,600	182,6640	2383,210	2941,200	3233,600	3822,270	3822,270	3822,277
Remain	-2666000	757,032	381,496	412,4586	1681,816	2239,096	2531,496	3120,166	3120,166	3120,16
Repayment	-	759,000	731,000	688,000	645,000	601,000	559,000	516,000	473,000	430,000
Net Income	-1892,000	-11168	-349,504	456,536	1036,816	1637,096	2475,596	2604,166	2647,166	2690,17

U

RECOMMENDATIONS

8.1 The project investment will be invested only once by the project members for the preparation of land. The project members can make use of the land as long as they need. The other investment is meant for fish fries seedlings and other maintenance cost such as food, fertilizer etc. The

The return on investment is quite high.

8.2 The project member the project will enable the project members to engage in farming all year round no need to seek for employment in the city during the period of after harvesting season [March - May] one of a national problems which the government is trying to solve.

8.3 The project initiated by the coop if the project is successful, it will enable the non member farmers to admit the coop and to participate in coop activities.

8.4 To propose for government fundings for the amount of 30 million B

8.5 The project member will be able to increase the income and uplift their living standard as well as create employment for member.

8.6 The project will help in human resource development as well as to introduce new farming techniques to the member. enable them to generate the income from various products which

have no mailaticy problems

Interests of Investments

Classification	Y2	3	4	5	6	7	8	9	10	11
total Investment	5440,000									
Coop	3440,000									
Principal	344,000	344,000	344,000	344,000	344,000	344,000	344,000	344,000	344,000	344,000
Coop Interest	425,000	387,000	344,000	301,000	258,000	215,000	172,000	129,000	86,000	43,000
total	769,000	731,000	688,000	645,000	602,000	559,000	516,000	473,000	430,000	387,000

Interest Rate Coop. = 12.5%

Cost 86 Members

Items	1	2	3	4	5	6	7	8	9	10
cost 86	3440000	325768	702104	702104	702104	702104	702104	702104	702104	702104
service	295000	215000	215000	301000	301000	301000	301000	301000	301000	301000
Total	3655000	540768	917104	1003104	1003104	1003104	1003104	1003104	1003104	1003104

Income Member

Items	1	2	3	4	5	6	7	8	9	10
Income	774000	1083600	1083600	1826640	2383920	2941200	3233600	3822270	3822270	3822270

FINANCIAL ANALYSIS PROJECT

Y	BENEFIT	COST	PWF 14%	Present Value BENEFIT	Present Value COST	NPV BENEFIT	NPV COST	NPV	NPV %	NPV %	NPV %	NPV
1	774,000	3655000	.877	678,798	3205435	-281,000	-1593944	6667	833	6667	833	-1910763
2	1083600	540760	.769	832,288	415850	542,832	1573396	4444	694	4444	694	241234
3	1083600	917104	.685	742,266	628,216	166,440	285563	2963	579	2963	579	49332
4	1026640	1003144	.592	108137	593837	823530	78396	1975	482	1975	482	162048
5	2383920	1003144	.519	1237254	520,610	1300816	73104	1317	402	1317	402	181853
6	2941200	1003144	.456	1341187	457,415	1938096	57069	8879	335	8879	335	170358
7	3233500	1003144	.400	1293440	401,241	2230496	36405	0585	279	0585	279	130484
8	3822270	1003144	.351	1341616	352,089	2819166	25617	0330	223	0330	223	104047
9	2822270	1003144	.308	1177259	308,956	2819166	14,219	0250	194	0250	194	73298
10	5822270	1003144	.270	1032012	270,838	2819166	7900	173	162	173	162	48771
...				9785257		754487	394675					-734837

B/C RATIO = 1.37

NPV = 2630770

IRR = (20 + (50 * 20)) (394675 - (-734837))

20 + (30) (.35)

20 + 10.5

Population 1990

Tumble	Village	Population	
		Men	Women
Keungkrow	6	2503	2767
Rongchang	6	2622	2711
Total	12	5125	5484

Paddy I Produce in Area Project.

Tambul	rais	Produce / μ m
Meung Khors	2400	1200
Rongchang	4860	2430
Total	7260	3650

Paddy II Produce

Tambul	rais	Produce / μ m
Meung Khors	1358	678
Rongchang	4345	2172
total	5703	2851

PRODUCTION PADDY PHUAT

PADDY	YEAR			
	1980	1989	1988	1987
mt	48,043	249,219	231,853	245,123

PRODUCTION PADDY OF ABER PAJICE

Tembak	Production Paddy			
	1990	1989	1988	1987
Maug Knon	204	1020	987	1105
Rongchang	486	2430	2146	2341
total	690	3450	3133	3446

Production cost of project mixed farming/rai

1.	breed fish	405	₱
2.	feed fish	102	₱
3.	seed crops	318	₱
4.	fertilizer	148	₱
5.	chemical	87	₱
6.	other	67	₱
	total	1,127	₱

Production cost paddy per rai

1.	seed	80	₱	
2.	plowing	300	₱	
4.	seeding and rice transplantation			230 ₱
5.	Fertilizer	260	₱	
6.	Harvest	200	₱	
7.	paddy reaping	100	₱	
8.	processing in storage	75	₱	
	Total	1,317	₱	

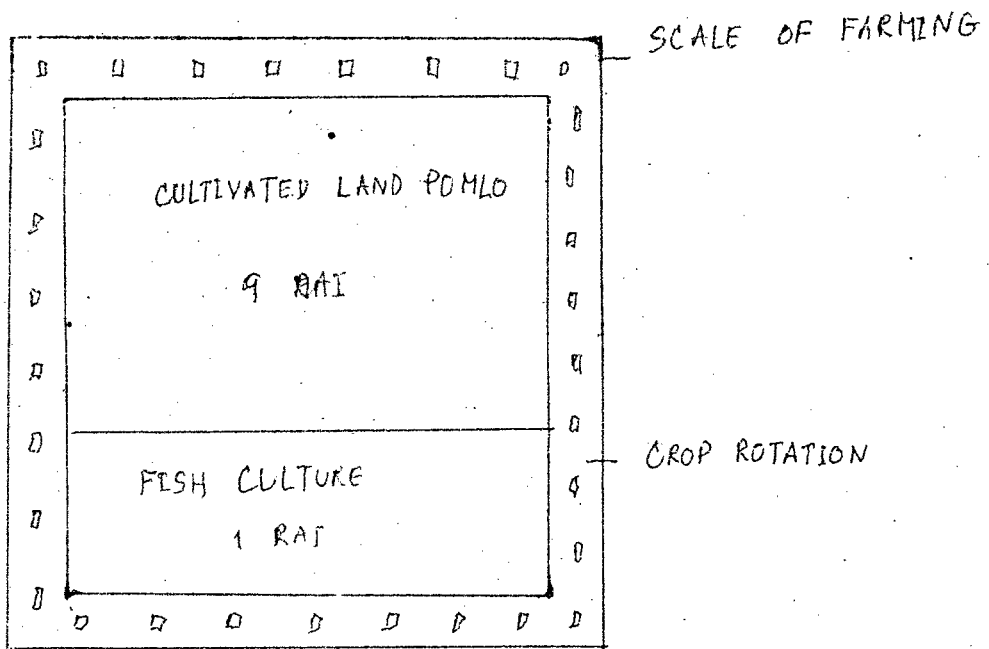
Comparison Income Project 1 rai

Items	producer	price	Income	cost	Net Income
Fish	138	18	2484	507	1977
Fruit					
Orange	59.53	15	893	602	273
Total	147.53	43	3377	1127	2250

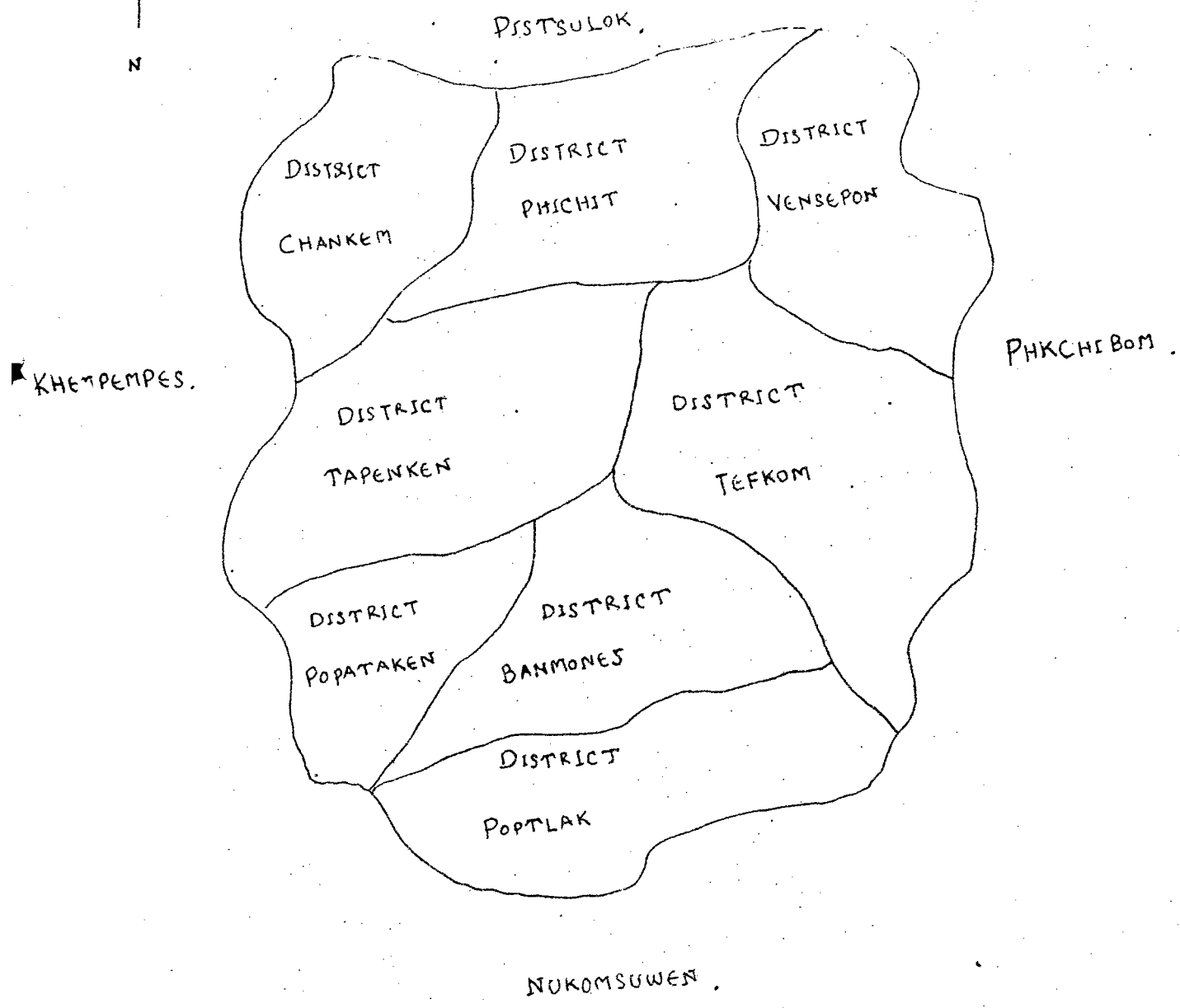
Comparision Producer Paddy

Production	production per rai[kgs]	Price	Income	Cost	Net Income
Paddy I	500	3.8	1900	1317	583
Paddy II	500	3.2	1600	1317	283
Total	1000	7	3500	2634	866

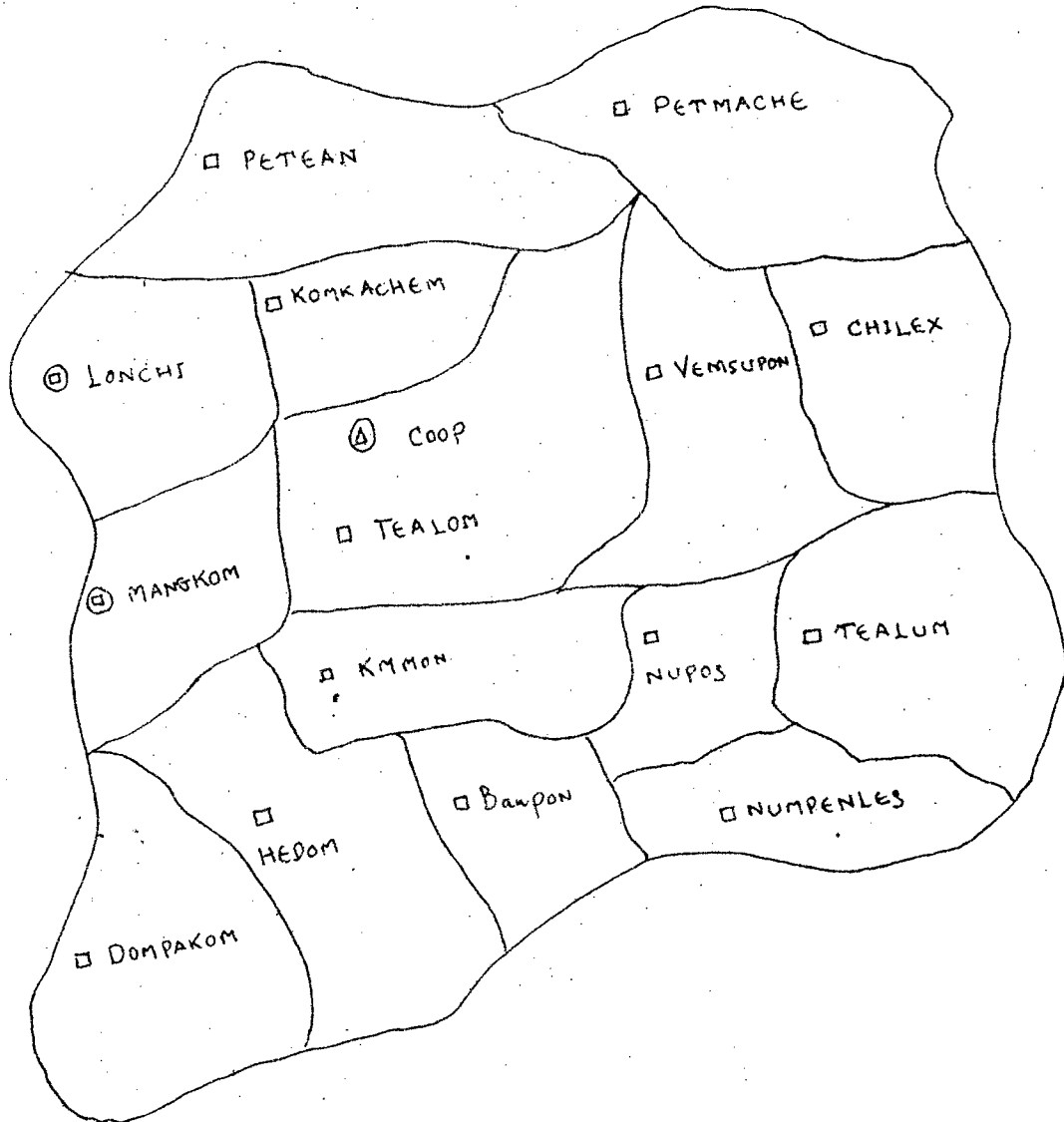
Pattern mixed farming



Map PHICHIT



DISTRICT PHICHIT AND AREA PROJECT



- △ COOP.
- AREA PROJECT
- MEMBER GROUP.